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Editor's Foreword

Psychology Days in Zadar is an international conference organized biennially by the Department of Psychology of the University of Zadar. It started over 40 years ago and it has evolved over decades into a recognizable psychology conference that attracts many researchers from Croatia and abroad.

The 21st Psychology Days conference in Zadar was held on May 24-26 2018. It was organized by an international organizational-scientific committee and gathered over 330 active participants from Spain, Slovenia, Bosnia and Herzegovina, Serbia, Macedonia, Hungary, Czech Republic, Austria, Russia, Netherlands, Norway, Turkey and USA. At conference, 130 papers were presented through four invited lectures, two symposia, twelve oral sessions, two poster sessions and four workshops.

Encouraged with authors' interest and positive experiences regarding previous editions of Book of Selected Proceedings (after 15th and 20th Psychology Days), we have decided to invite authors who participated at 21st Psychology Days, to send their papers for publishing in the Book of Selected Proceedings of 21st Psychology Days in Zadar.

This volume contains the full-length versions of the two invited lectures and individual papers that were presented at the conference, and selected on the basis of the review process. Each paper underwent two-round, anonymous review process by two experts in the field (one from Croatia, one from abroad). List of reviewers can be found at the end of the book. After review process, eighteen papers were accepted for publication in the Book of Selected Proceedings of 21st Psychology Days in Zadar. The selected papers present research from diverse psychology disciplines and hopefully would make an important and quality contribution to the existing base of scientific knowledge.

This edition is result of join effort of authors, reviewers and members of Editorial Board. I wish to thank authors for choosing the Book of Selected Proceedings of 21st Psychology days in Zadar for publishing their work. I express my gratitude to the reviewers for implementing their time and knowledge in evaluation of papers, as well as authors for accepting reviewers suggestions. Most certainly, this efforts improved scientific quality of published papers. Also, I would like to thank members of Editorial Board for their invaluable contribution through all stages of preparing this volume – from reading the originally submitted papers, suggesting expert reviewers to the careful final reviewing of the papers. Finally, I express my gratitude to the University of Zadar for sponsoring editing and publishing costs of this edition.

On behalf of the members of the Editorial Board and all the authors whose works are published in this volume, I wish to express my sincere hopes that the Book of Selected Proceedings of the 21st Psychology Days of Zadar will be recognized as a respectable source of information and ideas for scientific and wide range audience.

Andrea Tokić
Editor-in-Chief

1

Teachers' Emotions and Emotion Regulation: An Overview of Contemporary Research Findings

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Abstract

Even though emotions have been recognized as core and inevitable part of teaching and professional lives of teachers, systematic research on teachers' emotional processes was largely lacking until the last several years. Nonetheless, the existing studies indicate that emotions teachers experience at work, as well as strategies they use to regulate them, are important determinants of teacher well-being, motivation, relationships with students, and teacher effectiveness. Considering the fact that contemporary knowledge on teachers' emotional processes is still rather scarce and fragmented, the present paper seeks to offer an overview of teachers' emotions with regard to their: 1) contextual triggers and components, 2) available assessment possibilities, 3) regulation, and 4) effects on teachers' well-being, instructional practices, and students' outcomes. Lastly, directions for future research and practical implications for promoting teacher well-being and effectiveness are provided.

Keywords: teachers, emotions, emotion regulation, effects on teachers and students

Emotions are constituent parts of every classroom. And while the topic of students' emotions has received extensive research attention in the last couple of decades (Pekrun & Linnenbrink-Garcia, 2014), teachers' emotions have been largely neglected. Luckily, in the last several years, empirical studies devoted to investigation of emotional aspects of teachers' lives have started to emerge. It was recognized that teachers indeed experience a wide variety of emotions of significant intensity that affect both teachers, their students, and education in general (Sutton & Wheatley, 2003). Fried, Mansfield, and Dobozy (2015) proposed a broad conceptual model of teachers' emotions to guide future research in this area of investigation. According to their model, personal characteristics (i.e. identity, beliefs, values, and personality traits), cognitive appraisals, and wider social, cultural, and political factors influence teachers' emotions, which, in turn, provide quality to experience, trigger regulatory strategies, and shape teachers' cognitive and motivational processes (Fried et al., 2015). Indeed, studies show that teachers' emotions influence their well-being, burn-out risk, turnover, and dropout from the teaching profession (Chang, 2009; Macdonald, 1999). In addition, teachers' emotions are related to their instructional practices and relationships with students, thus, affecting students' outcomes too (Frenzel, 2014; Hagenauer & Volet, 2014). Nonetheless, the empirical evidence on teachers' emotions is still rather scarce and fragmented, and comprehensive theoretical frameworks on phenomenology, antecedents, and effects of teachers' emotions are largely missing. Therefore, the aim of the present paper is to offer an overview of teachers' emotions with regard to their: 1) contemporary definition, 2) available assessment possibilities, 3) regulation, and 4) effects on teachers' well-being, instructional practices, and students' outcomes.

Defining teachers' emotions: their sources and components

In order for an emotion to emerge, a person needs to appraise the external or internal stimuli as relevant for his or her own goals (Scherer, 2009). Since teachers' emotions are variants of human emotions in general, it can be expected that teachers' emotions also emerge as a result of cognitively appraising certain situations as relevant for their own goals. Indeed, the reciprocal model on causes and effects of teachers' emotions (Frenzel, 2014) stipulates that teachers seek to achieve four classroom goals: 1) students' acquisition of knowledge and competences, 2) students' motivational engagement in learning, 3) students' development of socio-emotional competences, and 4) establishment of well-functioning teacher-student relationships. Based on teachers' cognitive appraisals whether students' behavior in classroom corresponds with these goals, diverse emotions can develop.

In support for the reciprocal model on causes and effects of teachers' emotions (Frenzel, 2014), students and their behavior in classroom are found to be great sources of teachers' emotions. For instance, students' thriving and succeeding, positive communication in class, exemplary student behavior in class, attainment of teaching and learning goals, motivated students, etc. are recognized as important sources of positive teachers' emotions like joy, pride, love, and affection. On the contrary, students' misbehavior and violation of classroom rules, rude and disrespectful students, lack of students' effort and interest, unfulfilled learning and teaching goals etc. lead to teachers' negative emotions such as anger, hopelessness, anxiety, exhaustion, and disappointment (Burić, Slišković, & Macuka, 2018; Hagenauer, Hascher, & Volet, 2015; Sorić, Burić, Slišković, & Macuka, 2015; Sutton & Wheatley, 2003). Moreover, it seems that teachers' emotions may be shaped by the quality of the relationship between teachers and their students. For instance, Hagenauer et al. (2015) found that teachers who felt more connected to their students, also experienced higher levels of joy and lower levels of anxiety and anger.

However, it is important to emphasize that sources of teachers' emotions may go beyond students and their behavior in classroom. For example, anger as one of the most prominent negative emotion experienced by teachers (Burić et al., 2018; Chang, 2013; Frenzel, 2014) also results from factors related to

parents, colleagues, and features of educational system and policy. More specifically, teacher anger may be triggered by situations like parental accusations and verbal attacks, parental interference in teacher's job, parents who put pressure on teachers to assign good grades to their children, etc. In addition, unfair distribution of tasks among school staff, hostile and uncooperative colleagues, incompetent colleagues etc. may evoke teacher anger. Finally, issues like frequent changes in the curriculum, excessive paperwork, and degradation of public respect towards teaching profession are recognized as important triggers of teacher anger, too (Burić & Frenzel, 2019a).

According to the contemporary multicomponent definition, an emotion can be generally defined as a process which consists of five components: subjective feelings, cognitive appraisals, motivational tendencies, facial and bodily expressions, and physiological changes (Scherer, 2005; 2009). All these components also exist in emotions experience by teachers. For instance, in a qualitative study on phenomenology of teacher anger (Burić & Frenzel, 2019a), it was found that teachers used words like angry, frustrated, annoyed, irritated, and tense to illustrate subjective component of their anger. To describe their cognitive appraisal processes related to anger, teachers mentioned thinking about losing control, evaluating the situation as unfair, and having doubts in effort and energy invested in their job. Next, teachers spoke about urges to yell, hit something, leave the classroom or even quit their job to describe their motivational component of anger. Teachers were even aware of their expressive and physiological components of anger since they talked about blushing and frowning (i.e. facial expression of anger) and symptoms like sweating, headache, as well as rise in a blood pressure and heart rate (i.e. physiological component).

Assessment of teachers' emotions

There are many ways to assess teachers' emotions. Emotions in academic settings can be measured by sophisticated methods such as observational approach, neuroimaging technique, and peripheral physiological measures of emotion-related arousal (Pekrun & Linnenbrink-Garcia, 2014). However, self-report is still one of the most frequently used methods for assessment of emotions in academic context (Pekrun & Bühner, 2014). Despite its obvious lack of objectivity, measuring teachers' emotions via self-report questionnaires has several advantages. For instance, self-report method is economical and the most useful tool for measuring subjective and cognitive component of emotion. Moreover, since teachers are aware of other emotional components too (i.e. motivational, expressive, and physiological) (Burić & Frenzel, 2019a), self-report method can be used to efficiently access to the experience of an emotion as a whole. Therefore, in the last couple of years, self-report instruments aimed at measuring teachers' emotions have started to emerge. Teacher Emotions Scale (TES; Frenzel et al., 2016) is one such instrument with good psychometric properties that measures teachers' emotions of enjoyment, anger, and anxiety related to teaching and students. Teacher Emotion Inventory (TEI; Chen, 2016) contains five scales measuring joy, love, sadness, anger, and fear, which teachers may experience not only in relation to teaching and students, but also in relation to colleagues, family, school, and wider societal factors. However, it is important to note that TEI captures a mix of these sources under the umbrella of the same emotion, which may result in lack of necessary precision when predicting specific teachers' outcomes. Teacher Emotion Questionnaire (TEQ; Burić et al., 2018) is a multidimensional self-report instrument that encompasses six scales aimed to measure teachers' emotions in relation to teaching and interacting with students, namely joy (e.g. "I am joyful when the class atmosphere is positive"), pride (e.g. "I feel like a winner when my students succeed"), love (e.g. "I feel warmth when I just think about my students"), anger (e.g. "Some students make me so angry that my face goes red"), hopelessness (e.g. "I feel hopeless when I think about the achievement of some students"), and exhaustion (e.g. "When I finish my work, I feel drained"). TEQ was developed and validated through a series of five independent studies that included more than two thousands teachers and employed both qualitative and

quantitative data, as well as exploratory and confirmatory approaches. TEQ scales have high reliability coefficients and function equivalently in terms of measurement across different educational levels. In addition, TEQ scales are theoretically meaningfully related to emotional labor, well-being indicators, teacher self-efficacy, and more general measures of positive and negative affect (Burić et al., 2018). Finally, since students and teaching are obviously not the only sources of teachers' emotions (e.g. Sutton & Wheatley, 2003), a scale that measures teacher anger as one of the most frequent teacher emotions (Burić et al., 2018; Chang, 2013; Frenzel, 2014) was developed. Teacher Anger Scale (Burić & Frenzel, 2019a) assesses anger that emerges in relation to various contextual triggers: *students* (e.g. "I am joyful when the class atmosphere is positive"), *parents* (e.g. "I feel my pulse speeds up out of anger when a parent tells me how to do my job"), *colleagues* (e.g. "The anger I feel about unequal workloads among the school staff makes me want to quit my job"), and *educational system* (e.g. "It infuriates me to think about how little the government invests in education"). These different contextual facets of teacher anger exhibited good psychometric properties too and showed to be meaningfully related to external measures of teacher emotion regulation and well-being.

Regulating teachers' emotions

Despite their diversity and intensity, not all teachers' emotions are seen as appropriate to be experienced or freely expressed. Instead, the experience and expression of emotions while teaching and interacting with students are bounded by implicitly prescribed emotional display rules of the teaching profession (Hochschild, 1983; Winograd, 2003). In general, teachers are expected to experience and display positive emotions such as enjoyment or enthusiasm and to suppress or hide negative emotions such as anger and frustration. In addition, it is believed that teachers should keep their emotions at moderate level of intensity, that is, avoid expressing emotions that are too weak or too strong (Taxer & Frenzel, 2015; Yin & Lee, 2012; Winograd, 2003; Zembylas, 2003). It is important to note that teachers often view these emotional display rules as discretionary, non-obligatory, and voluntary elements of their teaching role (Oplatka, 2007). In addition, they believe that compliance to those rules makes them more effective in reaching their teaching goals and desired learning outcomes in their students (Sutton, Mudrey-Camino, & Knight, 2009; Taxer & Gross, 2018). Nonetheless, in order to align their emotional experiences with those that are expected from them, teachers oftentimes need to engage in emotional labour.

Emotional labour can be defined as a process in which an employees modify the internal and expressive component of emotion to match them with the emotional display rules of their profession (Hochschild, 1983). Two main forms of emotional labor can be distinguished: 1) deep acting or conscious management of internal feelings in order to consequently change the observable emotional expression, and 2) surface acting or modification of outer display of emotion by hiding it or faking a more desirable one (Brotheridge & Grandey, 2002; Brotheridge & Lee, 2003). For instance, when teachers engage in deep acting, they may really try to feel the emotions that are desirable and expected from them by stimulating thoughts and activities that foster such emotions (e.g. thinking about the steady progress of their students to foster enjoyment and satisfaction). Alternatively, when teachers engage in surface acting, they invest effort in suppressing and hiding the observable signs of undesirable emotion and faking the more desirable one (e.g. hiding the observable signs of anger and faking calmness instead).

It is believed that emotions and emotional labour are reciprocally related to each other. For instance, it was established that individuals who are high in positive affectivity trait (i.e. a general tendency to be energetic, active, alert, and enthusiastic), are more prone to deep acting, while individuals who are high in negative affectivity trait (i.e. a general tendency to feel anxious, fearful, or guilty), are more likely to engage in surface acting (Kammeyer-Mueller et al., 2013). In return, engaging in certain emotional labour strategy affects the kind of emotion a person would experience. Empirical evidence indicates that surface

acting generally results in experiencing negative emotions while deep acting consequently increases positive affective experiences (Hülshager & Schewe, 2011; Scott & Barnes, 2011).

Even though it has been widely acknowledged that teachers perform emotional labor (e.g. Chang, 2009; Sutton, 2007; Taxer & Frenzel, 2015; Yin & Lee, 2012), there are not many studies that linked emotional labor to specific emotions. One exception is a panel study conducted by Burić, Slišković, and Penezić (2019b) which showed that teachers' emotions experienced while teaching and interacting with students and emotional labour strategies are indeed reciprocally related to each other over time. More specifically, it was found that teacher love positively predicted deep acting while teacher anger positively predicted surface acting (i.e. hiding feelings and faking emotion). On the contrary, teachers who more frequently engaged in deep acting, consequently experienced higher levels of joy, while teachers who more frequently hid their true feelings at work, consequently experienced higher levels of hopelessness. In addition, Burić & Frenzel (2019b) found that teachers who more frequently perform surface acting also experience higher levels of different facets of teacher anger, that is, anger experienced in relation to students, their parents, colleagues, and educational system in general. However, deep acting was negatively and weakly associated only to anger that teachers experience in relation to students. It is important to note that when it comes to employees' well-being, surface acting has adverse and deep acting has positive or neutral consequences; however, surface acting may have positive effects on organizational performance indicators (Grandey & Gabriel, 2015; Hülshager & Schewe, 2011).

Despite the fact that emotional labour is an unavoidable mechanism through which teachers regulate their emotions at work, its conceptualization is rather narrow. In other words, it is reasonable to assume that teachers engage in strategies to regulate their emotions that go beyond deep acting and surface acting. The process model of emotion regulation (Gross, 1998; 2015; Gross & John, 2003) may be used as a useful wider theoretical framework for understanding teachers' emotion regulation. According to this model, five families of emotion regulation processes can be distinguished: situation selection (i.e. taking actions that alter the likelihood of ending up in a situation that will trigger certain emotion), situation modification (i.e. modifying the characteristics of a situation that will trigger certain emotion), attentional deployment (i.e. redirecting attention from a stimuli that evokes certain emotion), cognitive change (i.e. cognitively re-appraising the situation in order to modify subsequent emotion), and response modulation (i.e. employing strategies like suppression to change physiological, experiential, or behavioral emotional responding). It is important to note that first four families of emotion regulation strategies are antecedent-focused, that is, they are used before an emotion is activated, while the response modulation is used to alter the components of emotion once it is already fully developed (Gross & Thompson, 2007).

The knowledge regarding teacher emotion regulation strategies is still scarce. However, in a qualitative study on a sample of middle-school teachers, it was found that teachers regulate their emotions in classroom both in order to act professionally (i.e. to experience and display emotions that are expected from them as teachers) and to avoid subjectively disruptive and unpleasant emotions (Sutton, 2004). The richness of strategies that teachers mentioned in this study fitted well into the process model of emotion regulation (Gross, 1998; 2015). Teachers used antecedent-focused strategies such as modifying the situation (e.g. good preparation for class), attentional deployment (e.g. changing attention direction towards more pleasant content), and cognitive change (e.g. changing the view on the situation through self-talk), but also the response-focused strategies (e.g. suppressing the external signs of emotion, deep breathing, etc.) in order to regulate their emotions in classroom. Similar results were obtained in a descriptive study of Taxer and Gross (2018) as well as in a qualitative study conducted on Croatian sample of middle-school teachers (Burić, Penezić, & Sorić, 2017). Teachers in the latter study reported to use a wide variety of emotion regulation strategies to regulate emotions experienced at work. These strategies could be grouped into the five broader families proposed by the process model of emotion regulation (Gross, 1998; 2015) as well. Among

the antecedent-focused strategies, Croatian teachers mentioned strategies such as avoiding conflicting or emotionally disturbing situations and interactions in the classroom (i.e. avoiding the situation); developing professional skills and competences, seeking solutions to problems, and adapting teaching techniques and methods (i.e. active modification strategy); fantasizing and thinking about something else (i.e. attentional deployment); and positive thinking, prioritizing, taking another perspective of the situation etc. (i.e. reappraisal). Teachers in this study also talked about a variety of strategies that are response-focused. More specifically, teachers reported to hide external signs of emotions and to ignore their subjective feelings (i.e. suppression); to deep breathe, count to ten before reacting, taking some fresh air (i.e. immediate tension reduction); to yell, cry, pour out problems to colleagues, family members, or friends (i.e. venting); and to use a wide set of other unspecific strategies (e.g. socializing with friends, engaging in hobbies and sport, reading, praying, etc.). Moreover, these emotion regulation strategies were related to teachers' discrete emotions – teachers who more frequently use active modification strategy and reappraisal, experience higher levels of joy and pride towards their students. On contrary, teachers who more often rely on suppression and tension reduction, experience anger, exhaustion, and hopelessness to a greater extent. Interestingly, strategy of avoiding the situation was positively associated both positive and negative teachers' emotions (Burić et al., 2017).

The importance of teachers' emotional processes for teachers' well-being and motivation

Considering their diversity and outspread, it is not surprising that teachers' emotional processes are important factors in explaining teachers' well-being and motivation. For instance, teachers' negative emotions have been acknowledged as important for predicting teacher burnout and even for an increased risk for dropout from the teaching profession (Carson, 2006; Chang, 2009; 2013; Day & Gu, 2000). In addition, it seems that higher levels of initial teacher burnout are also predictive of higher levels of negative emotions of anger and hopelessness experienced at subsequent assessment (Burić, Slišković, & Penezić, 2019a). Moreover, teachers' anger is not only related to their emotional exhaustion; it also stimulates teachers to engage in emotional labor, which is of great importance for developing burnout symptoms (Keller, Chang, Becker, Goetz, & Frenzel, 2014).

Emotions experienced at work are relevant factors in shaping job-related attitudes (Ashforth & Humphrey, 1995; Weiss & Cropanzano, 1996). Indeed, teachers who experience higher levels of negative emotions seem to be less satisfied with their job (Burić, Cvijetović, & Macuka, 2017; Burić & Frenzel, 2019a; Burić et al., 2018; Frenzel et al., 2016). On contrary, experience of positive emotions is positively related to greater level of teachers' job satisfaction (Burić et al., 2018; Macuka, Burić, & Batur, 2017). Finally, teachers' negative emotions experienced in relation to students, parents, and educational system were found to be related to an increased risk for impaired mental health, that is, to symptoms of depression, anxiety, and somatization (Macuka, Burić, & Slišković, 2017). However, heightened levels of psychopathological symptoms also resulted in elevated levels of negative emotions of anger and hopelessness among teachers (Burić et al., 2019a).

Besides emotions, emotion regulation is also related to teacher well-being indicators. For example, emotion regulation strategies such as active modification strategy and reappraisal are positively related to teachers' job and life satisfaction (Burić et al., 2017; Yin, Huang, & Wang, 2016). Next, suppression used by teachers to regulate their emotions seems to be related to higher levels of anxiety and depression, while reappraisal is found to be positively related to teachers' levels of enthusiasm and contentment (Yin, Huang, & Lv, 2018). Moreover, research indicate that these two emotion regulation strategies may play an important role in explaining teachers' emotional exhaustion – emotional exhaustion is found to be positively related

to suppression, but negatively to reappraisal (Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010; Yin et al, 2016). Lastly, the existing findings indicate that teachers' use of surface acting is positively related to burnout, but negatively to job satisfaction, while for the use of deep acting, the opposite pattern of relationships was found (Macuka et al., 2017; Philipp & Schüpbach, 2010; Slišković, Burić, & Bubić, 2017).

Teachers' emotional processes are not only relevant in predicting teacher well-being, but are also of great importance for explaining their motivation. It was empirically established that teachers' emotions and work engagement are reciprocally related to each other over time – teachers who experience more joy, love, and pride while teaching and interacting with students, consequently experience higher levels of vigor, dedication, and absorption at their work. On the contrary, teachers who experience higher levels of anger, exhaustion, and hopelessness in relation to their students, are consequently less engaged in their work. The opposite direction of causation was also confirmed – highly engaged teachers consequently experience more positive and less negative emotions (Burić & Macuka, 2018). Teachers' emotions are also associated with their sense of efficacy, which is considered to be one of the most important motivational constructs that explain teaching behavior (Tschannen-Moran & Woolfolk Hoy, 2001). Results of the existing studies that explored the relationship between teachers' emotions and self-efficacy demonstrated that teachers who experience positive emotions to a greater extent, also have higher levels of self-efficacy. On the contrary, teachers' negative emotions seem to be negatively related to teacher self-efficacy (Burić & Frenzel, 2019a; Burić & Macuka, 2018; Burić et al., 2018).

The importance of teachers' emotional processes for teachers' instructional behavior and student outcomes

Students' relationships and interactions with teachers are of crucial importance for their academic engagement and healthy development. A widely used theoretical framework of classroom processes refers to Teaching Through Interactions (TTI; Hamre & Pianta, 2007) according to which classroom interactions between teachers and students can be organized into three major domains – emotional support, classroom organization, and instructional support. Interactions between teachers and students are proposed to be influenced by students' emotional processes. For instance, according to the reciprocal model on causes and effects of teachers' emotions (Frenzel, 2014), emotions influence teaching quality, that is, cognitive and motivational stimulation, classroom management, and social support they provide during teaching. Furthermore, these aspects of instructional behavior have effects on students' cognitive growth, motivation, social-emotional behavior in class, as well as on the quality of teacher-student relationship. Indeed, available research shows that teachers' reports of their enjoyment experienced while teaching are positively related to students' ratings of various aspects of teaching practices (i.e. monitoring, elaboration, comprehensibility, autonomy support, teacher enthusiasm etc.; Frenzel, Goetz, Lüdtke, Pekrun, & Sutton, 2009; Frenzel, Goetz, Stephens, & Jacob, 2009; Kunter, Frenzel, Nagy, Baumert, & Pekrun, 2011). In addition, there is evidence showing that teachers' emotions are directly related to students' outcomes. For instance, positive teachers' emotional experiences such as enjoyment and enthusiasm are found to be positively related to students' affective and motivational outcomes (Burić, 2019; Frenzel, Becker-Kurz, Pekrun, Goetz, & Lüdtke, 2017; Frenzel, Taxer, Scwab, & Kuhbandner, 2018; Keller, Becker, Frenzel, & Taxer, 2018). Lastly, scattered existing findings show that teachers' emotional labour strategies are also important in explaining their instructional behavior and students' outcomes. More specifically, hiding feelings was found to be negatively related to class-perceived teacher enthusiasm, while faking emotions had positive associations with both class-perceived teacher enthusiasm, and with class levels of intrinsic motivation and positive affect, implying that teacher enthusiasm mediates the relationship between teacher emotional labour and students' outcomes (Burić, 2019). Moreover, hiding feelings in class reported by teachers was associated with lower instruction-

al quality as perceived by the students; however, teachers' faking emotions was also positively linked with class-level of cognitive, behavioral, and emotional engagement (Burić & Frenzel, 2019b).

Directions for future research and practical implications

In spite of the fact that research on teachers' emotions has shown steady progress in the last several years, many unanswered questions remain. For example, much more research on individual, contextual, and situational antecedents of teachers' emotions and emotion regulation strategies is needed. More specifically, effects of teachers' personality traits, motivation, or cognitive appraisal patterns in predicting teachers' specific emotions need to be empirically established. Next, quantitative studies on the role of school leadership or school climate on teachers' emotional processes are practically non-existent. In addition, joint effects of personal and environmental factors on teachers' emotional processes are yet to be revealed. Finally, more research is needed to establish the effects of teachers' emotions and emotion regulation on their performance, namely the instructional quality they deliver, as well as their students' cognitive, motivational, and affective outcomes. Bearing in mind that contemporary theories emphasize the dynamic and malleable nature of emotion and emotion regulation (Gross, 2015; Kuppens, 2015), future research should be focused on extending and replicating the existing findings by implementing longitudinal designs and intervention studies and by relying on assessment tools other than self-report (e.g. students' perceptions of teachers' emotions and/or observing and videotaping teachers' emotional processes; Chang, 2009; Frenzel, 2014; Keller, Frenzel, Goetz, Pekrun, & Hensley, 2014).

Finally, the existing knowledge on effects of teachers' emotions and emotion regulation on teacher well-being, instructional practices, and students' affective and motivational outcomes, could serve as useful tools in creating education programs for pre-service teachers and professional development programs for in-service teachers. More specifically, teachers could be trained to use more beneficial emotion regulation strategies that would prevent the experience of intense and adverse emotions that, in the long run, can erode their well-being. Strategies that are generally related to positive emotions and adaptive outcomes are reappraisal and active modification strategy (Burić et al., 2017; Gross & John, 2003). On the other side, research indicate that suppression or hiding feelings likely leads to impaired well-being and suboptimal teaching performance (Burić, 2019; Burić & Frenzel, 2019b; Burić et al., 2017; Burić et al., 2018) and therefore, should be avoided. However, faking emotion, even though a component of less beneficial form of emotional labor in terms of employees' well-being (Hülshager & Schewe, 2011), actually may have positive effects when it comes to teacher effectiveness (i.e. their instructional quality and students' outcomes) (Burić, 2019; Burić & Frenzel, 2019b). Nonetheless, caution is needed when giving practical meaning to these results because of potentially undesirable and adverse consequences that faking emotion can exert on teachers' well-being.

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Big Data Between Technology and Science: Challenges for Psychology and Social Sciences

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Abstract

Among phrases that originated in the context of IT and have become virally immersed in everyday life is “big data”. Especially with the work of Kosinski and his colleagues, it has gained considerable attention in psychology and related disciplines, and following the Brexit and the US presidential election campaigns in 2016, has spread beyond the sphere of strict science. In the article we question whether big data research represents a distinctively new endeavour in the empirical sciences. From a methodological and analytical perspective, the three Vs of big data, volume, velocity and variety – represent challenges that foster new (interdisciplinary) strategies to handle them properly, but from the more traditional psychological perspective, a fourth V – veracity, addressing the importance of data truthfulness – raises additional questions. However, from the perspective of psychology and the social sciences, ethical considerations, addressing questions of privacy, anonymity and autonomy are even more important.

Keywords: big data, psychology, ethical considerations, privacy

Big Data in Social Sciences and Psychology: A Recent Endeavour?

In recent years many phrases from the world of information technology have gained special attention from the professional and general public, and with the immersion of social networks into our everyday life, one of these phrases is definitely “big data”.

Following Harlow and Oswald (2016), “big data involves the storing, retrieval and analysis of large amounts of information” (p. 447). To put it more simply, it involves work with large data sets.

Some authors have ascribed the origin of the concept to a computer scientist from Silicon Valley, John Mashey in the late 1990s (Diebold, 2012; Lohr, 2013). At first, big data research received considerable interest in the fields of computer science, business and statistics, the latter especially in the domain of government, medicine and public health.

According to the results of search engines in the most distinguished scientific databases, most of the scientific work relating big data to the social sciences (and psychology) dates from recent years (or even months). Could we thus make an assumption that big data studies are relatively recent in the research field of social sciences, and psychology in particular? Or could we even call it a new endeavor in the social sciences and psychology?

If we interpret the definition of big data as merely a huge amount of data, the answer would be definitely no. Two classic examples from the domain of psychology, with a prominent influence on the broader (social) sciences, could be quite useful in providing an answer to the previous question.

In the late 1960s and early 1970s, Hofstede conducted a study on a huge sample of more than 110,000 workers in a global multinational company (the company was later revealed to be IBM). From the data gathered, he elaborated his model of cultural value dimensions, and his most popular value dimension, individualism versus collectivism, made an enormous impact on future research in diversity among social science fields (e.g. Hofstede, 1980, 2001).

In the late 1980s, a new model of personality structure was proposed, which claimed to be universal. It comprises the personality traits of Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism. The era of the Big Five model (later also known as the OCEAN model) was on the rise (e.g. Goldberg, 1981). Studies of the model in different demographic and sociocultural groups (gender, age and culture) used samples as large as 11,000 or 23,000 participants (e.g. Costa, Terracciano, & McCrae, 2001; McCrae, Terracciano et al., 2005a, 2005b).

However, both examples represent research where data sets have a limited (manageable) number of items (i.e. constructs in the analysis); the large quantity of data is thus a consequence of the enormous number of cases (subjects or participants in the study). In the analytical sense, these data with relatively simple structures and consequent straightforward (statistical) analysis does not represent any serious challenges.

However, if we interpret big data as a mixture of data size and complexity at the same time, a better example is the World Values Survey project (WVS). WVS is a worldwide research project, conducted on representative samples from all parts of the world, in more than 100 countries and with almost 400.000 respondents (WORLD VALUES SURVEY, 2017). It explores a variety of concepts, from values and beliefs, to specific attitudes, and through relatively structured and stable questions and items, addresses these issues in different time sequences, with the first wave between 1981 and 1984. Wave 6 is currently available, covering data from the surveys between 2010 and 2014 (WORLD VALUES SURVEY Wave 6 2010-2014).

In our opinion, the above-mentioned interpretations and examples do not fully represent the modern definition of big data. With the advent of the web and online social network sites (OSNs), the meaning of big data changed to incorporate the changing nature of the number of (online) participants

and incorporated constructs, indicators or other information about participants. Modern-day big data are very dynamic systems, incorporating more and less structured information: to analyse everything that someone is online, together with everything that someone does online, and possibly executing this in real time.

Leskovec (2008), in his seminal work, claims that analysis performed on big data reveals otherwise invisible phenomena. In addition, the author points out an opportunity to analyse social phenomena like communication patterns, using anonymized datasets without compromising individual privacy.

Big Data and Psychology on OSNs: Case Kosinski

The digital age can best be illustrated with the phrase “datafication of everyday life”, which is a product of the extent to which people use digital and online technologies, as well as the extent to which digital technologies have replaced older ways of life (Chen & Wojcik, 2016, p. 458).

As Kosciejew first quoted Wolf from *The New York Times*, “And yet, almost imperceptibly, numbers are infiltrating the last redoubts of the personal. Sleep, exercise, sex, food, mood, location, alertness, productivity, even spiritual well-being are being tracked and measured, shared and displayed” (Wolf, 2010), he later added:

The individual and (ideas of) individuality are being transformed into quantifiable, statistical, and objective data points that can (allegedly and supposedly) help reveal new possibilities, novel insights, and hidden facts about ourselves. A data-driven life, in other words, is datafying the individual (Kosciejew, 2013, p. 47).

To estimate the size of the Internet and the quantity of transactions on the web is an almost impossible mission. To illustrate it, Amin (2017) in the Big data overview 2013-2014, collected the following information: Google processes 100 petabytes per day on 3 million servers; Facebook has 300 petabytes, processes 500 terabytes per day and has 35% of the world’s photographs; YouTube has 1000 petabytes of video storage and 4 billion views per day; Twitter processes 124 billion tweets per year. The importance of big data (for different purposes) is thus quite obvious – as is any elaboration of the definition of big data.

According to Laney (2001), big data can be described with three Vs or three dimensions: Volume, Velocity and Variety. Volume is related to the large size of the dataset, velocity to the high speed of data acquisition and processing and variety to the diversity of data types, being often an unstructured mixture of texts of speeches, photographs, videos and numbers (e.g. Chen & Wojcik, 2016; Cheung & Jak, 2016). Especially from the perspective of psychology, some authors add a fourth V – Veracity, addressing the importance of data truthfulness (e.g. Cheung & Jak, 2016; Saha & Srivastava, 2014). In more psychological or psychometric language, this V is related to the question of the data validity and the consequent conclusions based on data analysis. As a simple rule of thumb, big data refers to datasets that cannot be adequately processed by traditional IT and its tools (Chen, Mao, Zhang, & Leung, 2014).

This new dynamics and understanding of big data in the domain of psychology can be quite illustrative, as seen in the work of Michal Kosinski.

Kosinski (e.g. Kosinski, Stillwell, & Greapel, 2013) shows that using a very few, easily accessible indicators of human behavior, for example Facebook likes or Twitter followers and reactions (Quercia, Kosinski, Stillwell, & Crowcroft, 2011), can accurately predict many personal attributes of a user. For example, it is relatively possible to predict reliably some highly sensitive personal data like “sexual orientation, ethnicity, religious and political views, personality traits, intelligence, happiness, use of addictive substances, parental separation, age, and gender” (Kosinski, Stillwell, & Greapel, 2013, p. 5802), using just FB likes. The likes significantly correlate with the above-mentioned personal attributes. Ko-

sinski developed this algorithm correlating public FB data with the results of traditional personality assessment questionnaires, like the well-known personality questionnaire NEO-PI-R (Kosinski, Stillwell, & Graepel, 2013).

Among Twitter users, just by reading their three publicly available data points – “followers”, “following” and “listed counts” – it is possible to predict personality traits according to the well accepted OCEAN (BIG5) model. This means personality can be effectively and easily predicted from public data (Quercia et al., 2011). In addition to simple online gestures, language pattern analysis could reveal transient personal states like emotions and also trait characteristics like personality (Schwartz et al., 2013).

This could be of great value for people when the findings support the needs of a given user. However, as Kosinski (2016) points out, one can also imagine that other people could use those algorithms to reveal attributes a person does not want to reveal, along with those attributes which could pose a threat to an individual. Another problem could be that other people could reach inappropriate conclusions about a person when the algorithm is wrong.

These examples show that even the most cautious users of social networks who protect access to their published content can easily be analysed and users have no insight into how this information will be used. Additionally, reliability of those assessments can be improved by integration of data from different sources. Finally, the data shared on social networks can be purchased from companies owning the systems and reused for unknown purposes.

From Big Data and Psychology: Mere Application or Manipulation?

One recent example of the above-mentioned activities is revealed by claims from Cambridge Analytica (Persily, 2017) about successful social influence involving political propaganda based on psychographics, which is the exploitation of psychological profiles created from available digital data, like Facebook data in the first place and other (legally) bought consumer datasets (e.g. from magazine subscriptions, to airline tickets).

Are all these claims realistic?

Several authors (like TED speakers Goldbeck, 2013; Kohn, 2014; Nolan, 2012; Kaliouby, 2015; Lupi, 2017) in the field of information technology and big data have expressed concerns about the integration of information sources in an individualized form, because psychological profiles can be developed from these. Since widespread social networks, with their ubiquity and pervasiveness, could lead to important social implications, they suggest how to reestablish privacy. The commonly suggested solutions are naive, such as “we should pay attention to what we click online”, or to resolving problems with technology by demanding even more technology. Despite these warnings, there are no scientific publications reporting how this knowledge about user personality can be (or has been) effectively used for manipulation.

As an active participant in US presidential campaign in 2016 helping first Ted Cruz and then Donald Trump, Cambridge Analytica is the most (publicly) salient case of using targeted communication based on psychometrics for social influence, even though there are still doubts about how factual these claims really are.

At first glance, such thinking could be supported by scientific research in psychology in the area of personality and attitudes. It is well known that cross-situational studies show that personality traits do not significantly predict behavior (Mischel, 1968). Similarly, behavior is often inconsistent with attitudes expressed by a person (especially more general attitudes) (Wicker, 1969; Ajzen & Fishbein, 1977). However, personality traits and attitudes, in combination with contextual influences, do affect behavior. With regard to the BIG 5 (OCEAN) personality model, research shows that low neuroticism, high openness and extraversion correlate with good response to messages promising comfort, and agreeable and con-

scientious subjects respond better to messages presenting utility aspects of objects and activities (Chen & Lee, 2008; in Gerber, 2013). Subjects displaying anxiety trait usually respond better to more attractive messages. On the other hand, less anxiety correlates more with better response to threatening messages (deBono, 1994; in Gerber, 2013). The most consistent claim across research studies is that subjects respond better to messages delivered by persons whom they evaluate as similar regarding their personality (Gerber, 2013). Hence, when manipulation activity is delivered in a context prepared for a specific target subject and according to their personality traits and attitudes, there are grounds for success. This kind of reasoning can also be identified in statements from Cambridge Analytica, who claim that they did not create the content of the messages for their clients (the presidential candidates), but that they analysed or influenced the context and advised when and where specific message would be most effective, and that they formulated targeted messages for specific recipients using their personality profiles.

How does this work on social networks? The principle was described in detail by Eli Pariser in his book "What the Internet is hiding from you" (Pariser, 2011). The author introduced the term "filter bubble", which is a principle where users on social networks get biased information adjusted to their past behavior. The more often you click on a certain type of content, the more of it you will be offered. Pariser focused particularly on the content and relationships available in the network. For example, he noticed that the newsfeed on his Facebook profile was biased toward messages from users consistent with his preferred political view.

The impact size of the filter bubble is questioned by other researchers like Liao and Fu (2013), who claim that, even when all information is present, users preferentially select information that reinforces their views, and also by Facebook itself, which claims that bias in newsfeeds is very low. Nevertheless, if personality information is used for customization of messages and customization of the environment according to the above-mentioned research, we can speculate that such a bubble could establish an effective context for manipulation.

Initial research performed during election campaigns shows that such manipulation is possible. For example, Bond, Faris and Jones (2012) proved that it is possible to increase participation in voting with a quasi-experiment in natural setting. They targeted 61 million Facebook users in the USA during elections and demonstrated that "go to vote" appeals in the form of social mobilization (showing photos of the user's friend who had already voted) did actually increase participation in elections. Even though the effect was not large (they report 0.14% actual increase), this is important in the context of big data and social networks, because the number of targeted users is enormous.

Gerber (2013) added personality dimension to this body of knowledge. The author explores the efficacy of different types of messages delivered to people of specific personality types at the level of attitude change and behavior change in "go to vote" campaigns. The results show that subjects displaying high openness are susceptible to different kinds of messages, and that other OCEAN traits contribute to effectiveness of more specific types of persuasive messages in this context.

Big Data and Psychology: Pros and Cons

Harlow and Oswald (2016), in the Introduction to the special issue of *Psychological Methods*, highlighted the common themes that emerge in psychological research in the area of big data. First, there are the mutual benefits of collaboration among diverse of disciplines, such as those from social sciences, applied statistics and computer science. Second, the availability of large data sets from different OSNs provides a psychological window into the attitudes and behaviors of a broad spectrum of the population, and, in a methodological sense, there arises the opportunity for and also the necessity of testing the diversity of predictive models in big data. However, in the process of acquiring and processing large data sets

from public or private sources, there are important ethical considerations.

Since psychologists remain mostly suspicious about big data movement, primarily because of widespread subjective perceptions about their impairment in the area of computer programming and related IT skills and lack of access to big data (e.g. Cheung & Jak, 2016); there is much less restricted optimism in the field of computer science. Montag, Duke and Markowetz (2016) promote the emerging research discipline Psychoinformatics, the interdisciplinary cooperation between psychology and computer science in handling large data sets derived from a range of heavily used IT devices.

However, Cheung and Jak (2016) argued that psychologists equipped with the knowledge, skills and capacities of psychological and behavioral theories, psychometrics and statistics, are valuable in understanding and processing big data. Specifically, this is the case in the phase of data collection (which data are collected and how), whether the data have adequate psychometric properties, and in subsequent phases of construction and testing the hypotheses and models, to explain behavior(s) with advanced statistics, such as multilevel modelling, structural equation modelling and meta-analysis. Additionally, what psychology can contribute to big data science is a strong theoretical background, which broadens the meaning of the findings. As Kosinski & Behrend (2017) pointed out, the data can only predict the future if it is consistent with the past.

There are numerous advantages of big data in psychological research. Besides classical psychological research techniques such as questionnaires and experiments conducted online, there is an unrestricted opportunity for the third fundamental technique: observation of human-computer interaction on a very large scale (Montag et al., 2016). Data can be divided into a large spectrum of samples, encompassing distinct groups, socio-structural groups, subcultures and cultures. Moreover, a (cross-)cultural perspective can even be analysed in a historical manner (for how big data can trace cultural change over time with Google Books Ngram Viewer, see Pettit, 2016). Because data on human-computer interaction represents directly recorded behavior(s), some biases or drawbacks of standard psychological techniques and measures are omitted - such as the tendency to produce socially desirable answers on self-report measures or, despite tracking of real behavior, tracking only behavioral intention or perception of behavior from past experience.

As an example, research in clinical psychology shows that psychopathology or related risks could be identified and dealt with in very early stages, reducing the cost of interventions and preventing severe outcomes. Also, the patients could better monitor their condition and the therapists could adjust medication in response to the present situation (Markowetz, Błaszkiwicz, Montag, Switala, & Schlaepfer, 2014). Luhmann (2017) reports that using big data one could successfully analyse the current state of subjective well-being on individual and social levels and predict changes in subjective well-being over time, especially in cases of rare events like natural disasters or terrorism where traditional research methods are not very useful.

In general, big data from OSNs represents a shift of research focus from subjective internal states or psychological constructs to objective, observable behaviors or results of behavior(s). By omitting subjective internal states, such as personality traits, emotional states, mood, intentions, interests and attitudes, this new research endeavor (i.e. psychoinformatics) can be seen as new form of behaviorism – cyberbehaviorism – the interrelation of digital behaviors without the necessary awareness of the individual (human).

Again, we face the question, whether digital or virtual behaviors (clicking or tapping) truly or authentically represent the individual. Or, can we adequately infer internal processes from these behaviors? Or vice versa? From the case of Kosinski et al., the answer would be affirmative.

However, to these questions, we can add three important (contextualized) issues. First, social

interaction through computer-mediated communication (CMC) represents a significant part of our everyday lives, but is still a specific kind of interaction. Fullwood (2007), from the work of McKenna et al. (2002), summarized the factors that set apart online spaces from the offline world: a greater propensity for anonymous interaction; a reduction in the importance of physical cues or appearance; a higher degree of control over time and space of the interaction; relative ease of finding similar others, and the additional factor of control over the content that is generated online. These characteristics have a significant impact on our self-presentation to others in the online world and its social relations. The question of whether our online self is authentic, or if we are the same online as offline, is still debated. It is hard to predict the future, but the idea that our real-life selves will in the future move in the direction of our online selves would probably gain a considerable number of votes from the professional or scientific public.

Second, from the methodological viewpoint, the data are collected and aggregated from multiple sources. This implies the data come from different contexts, using diverse data collection procedures, time spans, and error rates, which could all lead to incorrect statistical inferences. Consequently, Fan, Han & Liu (2014) call for new statistical methods in scientific research using big data.

Third, OSNs represent the complexity of social interaction. They do not merely serve as platforms for self-presentation by demarcated individuals, but are important place(s) of social influence, thus having a significant effect on someone's thoughts, feelings and behaviors and consequently her/his self-definition and identity. For example, the number of friends, number of likes, number and nature of comments can have a tremendous informative (i.e. what is right) or/and normative (i.e. what is consensual) impact on the individual, and consequently influence her/his future decisions and behaviors.

These issues address some of the theoretical or conceptual dilemmas, but probably the most important source of inconvenience that psychologists face in the context of big data can be attributed to ethical concerns. There is an established code of conduct in classical psychological research; however, in the context of big data, there are some potentially ambiguous situations. As, for example Montag et al. (2016) illustrate, a researcher or research team can deduce personality features of a user from his/her online behavior and hence have the potential to deny him/her a particular contribution. Or, in the analysis of big data, the characteristics of people that were primarily not in the scope of the particular big data sample can be processed (e.g. see article Webb, 2013).

This leads us to the major ethical concerns of big data processing: the issues of privacy, anonymity and autonomy. How should researchers deal with private information in the phase of collecting, processing and disseminating the data? Is the anonymity of research subjects preserved? Are participants informed about the research, and do they have a right to opt out of it? In sum, how is respect for persons (i.e. ICT users) addressed?

According to the previously mentioned cases of big data research in psychology and its application, these answers are generally not so clear-cut. In the context of big data health research, Rothstein (2015) argued that traditional research regulations should apply, and among essential things, individuals "...ought to be consulted and asked for permission before their specimens and data are collected, analysed, stored, and used for research" (p. 427), or, in other words, individuals "...ought to have the ultimate right to decide whether to participate in research" (p. 426). In this regard, researchers would be obliged to seek and obtain informed consent from the research subjects.

In summary, Kosinski et al. (2015) from various sources extracted that, since social scientists are relatively slow in embracing research on big data from OSNs, data-driven research has increasingly been left to computer scientists, who unfortunately, often lack the appropriate theoretical background and ethical standards relating to personal data protection. This is probably also a reason for psychologists (and other experts from the social sciences and humanities) to take a more active role in this interdisciplinary field.

Conclusion

In The Global Information Technology Report 2008-2009, Pentland (2009) proposed a “new deal on data”, which will, according to the author, be the first step towards open information markets. In reference to Old English Common Law, he postulated the three basic principles of ownership:

1. Rights of possession: You have a right to possess your data – e.g. you can open an account and remove your data whenever you’d like.
2. Full control over use: You must have full control over the use of your data – e.g. everything must be opt-in, but with regular reminders that you can optout.
3. Right to dispose of or distribute your data: You have a right to dispose of or distribute your data. If you want to destroy it or remove it and redeploy it elsewhere, this is your call.
(from Pentland, 2009, p. 79)

However, Pentland (2009) added one more principle, which addressed the combination of massive amounts of anonymous data to promote the common good. Aggregate and anonymous data can dramatically improve society: for example, people’s movement could be used for early identification of infectious disease outbreaks, for protection of the environment and public safety. A step towards the regulation of the processing of personal data, which addresses these principles in practice, is recently implemented general data protection regulation (GDPR; Regulation, 2016) in the European Union.

On the other hand, there are new endeavors promoting the common good, which are based on massive amounts of data that is NOT anonymous. Recently, at a national level, China started several experiments on how to build “social credit system that covers the whole society” (Hvistendahl, 2017). The aim of the system is to rate the reputations of individuals, businesses and government officials, using data from public and private sources. Initially, people can join the system voluntarily, but it is foreseen that it will mandatorily include all citizens by 2020. In parallel to this state-led project, there is a private credit system initiative by China’s largest marketing group Alibaba, named Zhima Credit. There are some indications that both systems will eventually merge or at least share data. Both systems use not only personal data but also a person’s social networks to calculate a credit score.

In conclusion, we see that the balancing dilemma between individual privacy, autonomy and personal benefits from available data, on the one hand, and collectively driven benefits, on the other, remains unsolved. The source of this problem lies in the process of mutual influence between a person and society. As much as a person and her/his life is influenced by society, society and its values are dependent on individuals that form the society. When looking from the perspective of an individual, it seems that active participation and emancipation of a vast number of IT users in the context of monitoring and responding to potential misuse of IT platforms and environments could resolve the problem of coercion and misuse of personal data. However, social forces go beyond the reach of any single person’s strength or influence. The person is a part of the broader society and is always influenced by the culture of the society that strives constantly to remain in existence.

Within big data research where new phenomena and patterns are revealed only when analyzing very large data sets (Leskovec, 2008), we can perhaps find empirical proof for social phenomena that could not be reduced to or explained on the personal or group level. Hence, most probably, proper answers regarding the use of big data, privacy protection, autonomy of individuals and the common good should also be sought in the interaction between psychological factors, as well as social and cultural factors. Looking for technical solutions, however artificially intelligent, for these problems would be naïve.

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3

Stress among Humanitarian Deminers: the Role of Family Support, Work-to-Family Conflict and Factors Related to Mental Help-Seeking

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Abstract

After the Croatian War of Independence, Croatian humanitarian deminers were left to deal with the consequences of warfare -- minefields and explosives. Due to the harsh nature of their work (e.g. frequent separation from family; work-related fatalities), there is an apparent need to determine the factors contributing to the level of stress among humanitarian deminers. The aim of this research is to investigate the role of family support and work-to-family conflict in coping with stress, as well as factors related to the seeking of professional psychological help among members of this group. An online questionnaire containing the scales Perceived Stress, Perceived Stigma, Barriers to Care, subscales Social Support, Work-Family Conflict, and the question of probability of mental health help-seeking in time of need, was constructed. The final sample consisted of 58 humanitarian deminers, aged 21 to 55, employed in the Croatian Army and private demining companies. Correlation analysis showed a moderate positive correlation between subjective stress and work-to-family conflict, while the correlation between subjective stress and family support, as well as work-to-family conflict and family support, was not significant. Furthermore, it was shown that humanitarian deminers who perceive less stigma have a higher probability of mental health help-seeking. In addition, by conducting regression analysis, work-to-family conflict proved to be a significant predictor of subjective stress among humanitarian deminers. The results point to the need for reducing stigmatization of professional psychological help-seeking, and demonstrate the importance of strengthening family support for individuals who are in need of professional psychological help.

Keywords: humanitarian deminers, subjective stress, family support, work-to-family conflict, mental health help-seeking

Introduction

After the Croatian War of Independence, those parts of Croatia affected by combat were left to deal with severe consequences -- minefields and explosives (Mine Aid, 2016). Today, a large number of humanitarian deminers employed by private companies, as well as humanitarian deminers of the Croatian Army and those employed by the Ministry of the Interior, are currently engaged in the process of demining and cleansing war-affected areas (Mine Aid, 2016). Altogether there are 67 cities and municipalities in 7 counties still suffering from consequences of war (Mine Aid, 2016). A National Mine Action Program was launched in 2009 with the goal of finally clearing Croatia of land mines. Humanitarian demining includes demining activities, but also those related to security, reconstruction and integration of war-affected areas, ecology, and protection from natural disasters (Mine Aid, 2016). As a result of their work, many deminers are dealing with stress and loss of psychological and physical health without professional psychological support. They spend days away from their families, have to meet unrealistic quotas and are always in danger of work-related fatalities (Torkington, Larkins, & Gupta, 2011). In addition, frequent absences from home are often the cause of marital conflicts, whose effects on the mental health of humanitarian deminers are yet to be investigated (Sibbel, 2010). Considering that Croatia is one of 24 countries with the highest number of work-related deaths among humanitarian deminers, there is an evident need for support, assistance and protection of those who continue to work in this field (Mine Aid, 2016). So far, however, no studies have been conducted in Croatia to investigate potential barriers to care (e.g. reasons for avoiding professional help among humanitarian deminers), as well as possible protective factors for coping with stress.

Taking into account the working conditions of humanitarian deminers, it is highly likely that they are experiencing large amounts of stress every day (Sibbel, 2010). Apart from the obvious effect stress has on them, the demanding nature of their work also affect their relationship with their families. Although work and family play a crucial role in a person's identity (self-actualization, success, satisfaction, security, etc.), they can often be at odds with each other (Čudina-Obradović & Obradović, 2001). This phenomenon is known as a *work-family conflict* and its disruptive impact on family life is recognized by Selvarajan, Cloninger and Singh (2013). This conflict can grow in two directions, work-to-family and family-to-work. By increasing the perceived level of stress at work, the possibility of satisfying family needs and duties is reduced (Nart & Batur, 2014). Therefore, work stress is recognized as the most important factor for intensifying the strength of work-to-family conflict (Čudina-Obradović & Obradović, 2001). On the other hand, social support in the family is another important factor which helps reduce the intensity of conflicts, along with good organization of work, experienced autonomy and social support at work (Čudina-Obradović & Obradović, 2001). People with higher levels of family social support will experience less destructive impact of work on their family lives, meaning they will be more successful in dealing with everyday family expectations (Selvarajan, Cloninger, & Singh, 2013). According to Adams, King, and King (1996), family emotional support is of great importance to life satisfaction.

Studies where participants differed in age, occupation, and other sociodemographic characteristics have shown that social support has enormous positive effect on individual health (Kim, Britt, Klocko, Riviere, & Adler, 2011). Research conducted on retired US soldiers showed that those who perceived stronger social support suffered from depression and PTSD less and were more adapted when facing psychosocial difficulties (Pietrzak et al., 2010). Another study conducted on British military personnel deemed social support to be a protective factor in the development of PTSD (Iversen et al., 2008). Given these results, it is likely that the psychological well-being of people working high-risks jobs will worsen in case of inadequate social support.

Although societal attitudes towards people in need of psychological help are growing more and more approving, many people still pay much attention to "what society thinks" when considering seeking

professional psychological help (Angermeyer & Dietrich, 2006). By internalizing societal attitudes, many individuals develop negative attitudes towards seeking professional help, which directly influences their behaviour (Vogel, Wester, & Larson, 2007). American soldiers hardly ever seek professional psychological help if they harbor negative feelings towards therapy, but the question remains whether those negative attitudes stem from suspicion towards its effectiveness or preference for other types of aid, such as social support (Kim et al., 2011). Lindsey, Joe, and Nebbitt (2010) approached this problem by surveying African-American adolescents suffering from depression. With increasing social support, the link between individual attitudes towards seeking professional psychological help and depression increases in such a way that those with greater social support have been shown to have more negative attitudes. A possible explanation for this finding is the lessened need for professional psychological help when social support is present. Interviews with adolescents, on the other hand, revealed that the perception of social consequences for people seeking professional psychological help is the most important factor in forming attitudes towards it (Chandra & Minkovitz, 2006). These results clearly illustrate the importance of social support, especially when it comes to facilitating and encouraging people to seek professional help.

Barriers to care include anything that limits or prevents people from receiving adequate health care. There are many possible reasons why adults avoid seeking professional help. These include negative attitudes towards help-seeking in general, concerns about cost, transportation, inconvenience, confidentiality, while the actions of some are guided by confidence in their ability to handle the problem on their own or, in some cases, suspicions towards the efficiency of treatment. Similar concerns regarding these kinds of attitudes are that the care will be unavailable when needed, that they would be treated unkindly, or that they would not know where to go for help (Britt et. al, 2008). Considering that the majority of humanitarian deminers are male, it is unknown how gender affects people's willingness to seek help. There is a growing body of research in the United States that suggest that men are less likely to seek help from health professionals for problems like depression, substance abuse, physical disabilities and stressful life events than women. A prominent theme among men is that traditional masculine behaviour (e.g. inhibition of emotional expressiveness) keeps them from seeking help when experiencing psychological problems (Galdas, Cheater, & Marshall, 2005).

After the Croatian War of Independence, psychosocial assistance networks were established as a starting point for the National Program of Psychosocial Aid for War Victims, from which a pyramidal model of providing psychosocial help to victims during and after the war originated (Kozarić-Kovačić, Kocijan-Hercigonja, & Jambrošić, 2002). This data clearly shows the importance of psychosocial help in dealing with traumatic events. It is also important to emphasize the need to investigate possible war-related psychological and social factors affecting those who are still struggling in the aftermath of the war. It is important to explore the possible correlation between factors such as social support or work-to-family conflict to stress levels and to ascertain whether social support, perceived stigmatization and barriers to care play a role when humanitarian deminers are deciding whether to seek professional psychological help or not.

The aim of this research is to explore and determine the relations between the level of subjective stress, family support, work-to-family conflict, perceived stigma, barriers to care and probability of mental health help-seeking in times of need among humanitarian deminers in Croatia. This research tried to determine the role of work-to-family conflict, family support and variables related to mental help-seeking in the subjective stress perception of deminers.

In line with previous findings, we formulated the following hypothesis:

- (1) We expect subjective stress, family support and work-to-family conflict to be intercorrelated, in such a way that humanitarian deminers who experience less family support and more

- work-to-family conflict perceive more subjective stress.
- (2) We expect family support to be correlated with probability of mental health help-seeking.
 - (3) We expect that humanitarian deminers who perceive more barriers to care and stigma have less probability of mental health help-seeking.
 - (4) We expect family support, work-to-family conflict, barriers to care and stigma to be significant predictors of subjective stress among humanitarian deminers.

Material and methods

Participants

Participants ($N = 58$) were male humanitarian deminers between the ages of 21 and 55 ($M = 38.43$). At the time of data gathering, all the participants worked as deminers either in the Croatian Mine Action Center ($n = 9$) or in one of the private companies specializing in demining operations throughout Croatia ($n = 49$). The majority of the samples are married ($n = 41$), the rest being in a relationship ($n = 9$), single ($n = 5$) or divorced ($n = 3$).

Measures

The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) was used to measure the degree to which individuals experience different life situations as stressful. For the purpose of adapting the scale to the Croatian language, we employed the method of double translation. The scale consists of 10 statements pertaining to the feelings and thoughts the participant had had in the past month (e.g. In the last month, how often have you been upset because of something that happened unexpectedly?). The participants had to estimate how often they experienced such situations on a scale of 1 (*never*) to 5 (*very often*). The result is formed as the sum of all responses. Higher scores indicate a higher level of stress experienced in the last month. The reliability of the scale was $\alpha = .879$.

Family support was assessed by one of the subscales of the Scales of Perceived Social Support, constructed by Macdonald (1998) and later adapted for Croatian research (Ivanov, 2010). The subscale used for this study consists of 28 items (e.g. There is at least one family member who helps me cope with life's everyday problems). Participants estimated their level of agreement with individual statements on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). The results are formed as the sum of all responses, with higher results indicating better family support. The reliability of the scale was $\alpha = .96$.

The work-to-family conflict subscale from the Work and Family Conflict Scale (Netemeyer, Boles, & McMurrian, 1996) was used to examine the disruptive impact of work on the participants' family lives. We used a version of this scale adapted to Croatian (Šimunić, Proroković, & Ivanov, 2014). The subscale consists of 6 items (e.g. The amount of time my job takes up makes it difficult to fulfil family responsibilities), which participants evaluated on a seven-degree scale (1 = *strongly disagree*, 7 = *strongly agree*). The overall result is obtained by computing the average estimate on the corresponding items. The higher results reflect a greater degree of Work-to-Family conflict. The reliability of this subscale was $\alpha = .815$.

The scales Perceived Stigma and Barriers to Care for Psychological Problems (Britt et al., 2008) were used to assess the participants' perception of stigma and barriers for receiving psychological help. Both scales were translated and adapted to Croatian using the double translation method. The Perceived Stigma scale consisted of 6 items concerning the participants' belief about being stigmatized when seeking help from mental practitioners (e.g. My peers might treat me differently, I would be seen as weak), while the

Barriers to Care scale consisted of 5 items relating to the degree to which participants experienced difficulties getting the help they need (e.g. It is difficult to schedule an appointment, Getting treatment costs too much money). Participants rated each of these items on a scale of 1 to 5 (1 = *strongly disagree*, 5 = *strongly agree*). The overall results on both scales represent the average estimate of agreement with all particles. Higher results on the Perceived Stigma scale indicate a greater feeling of stigmatization, while higher results on the Barriers to Care scale indicate a greater perception of barriers to getting psychological help. The reliability coefficient for the Perceived Stigma scale was $\alpha = .901$ and $\alpha = .79$ for the Barriers to Care scale.

According to the theory of planned behavior (Ajzen, 1991), attitudes toward specific behavior can be used to predict behavioral intentions with a high degree of accuracy. In order to determine the probability of deciding to seek mental health help, we used the particle which asks: "If you had any personal or emotional problems, how likely is it that you would seek professional psychological assistance?". The participants responded on a seven-degree scale, with 1 indicating *very unlikely* and 7 *very likely*.

Procedure

An online questionnaire was conducted for the purpose of this study. Apart from the scales mentioned above, the questionnaire consisted of various socio-demographic questions assessing gender, age and general information regarding the participants' current work and relationship status. In the beginning of the questionnaire, participants were informed about the purpose of the study and were guaranteed anonymity. Our e-mail addresses were also listed in order to allow the participants to ask further questions if needed. The questionnaire was then posted in Facebook groups and sent via e-mail to various demining companies throughout Croatia. The duration of the questionnaire was about 20 minutes.

Results

Table 1 shows the descriptive data for all scales used in this survey. According to the average results on the Perceived Stress Scale, the participants reported medium-level stress one month prior to data collection. Average results on the family support scale suggest that the participants perceive a relatively high level of support from their families. On the work-to-family conflict scale, the average results of the sample is higher than the scale's medium value. Given the seven-degree range of the subscale, the results suggest a moderately high level of work-to-family conflict among humanitarian deminers. Furthermore, participants in this sample perceive medium-level stigma and barriers to care for psychological problems, with a tendency towards lower values on both scales. As for the probability of seeking professional psychological help in times of need, the responses indicate medium probability of mental health help-seeking.

Table 1. *Descriptive statistics of the variables related to the subjective stress among humanitarian deminers*

	<i>M</i>	<i>SD</i>	Min	Max	Skewness		Kurtosis	
					<i>Statistic</i>	<i>Std. Error</i>	<i>Statistic</i>	<i>Std. Error</i>
Perceived Stress Scale	2.329	0.832	1.20	4.50	0.744	0.314	-0.332	0.618
Family Support	119.862	19.222	56.00	140.00	-1.295	0.314	1.660	0.618
Work-to- Family Conflict	4.523	1.446	1.00	7.00	-0.446	0.314	-0.401	0.618

Perceived Stigma	2.077	0.977	1.00	4.33	0.670	0.314	-0.546	0.618
Barriers to Care	1.937	0.955	1.00	5.00	0.921	0.314	0.491	0.618
Probability of mental health help-seeking	4.210	2.150	1.00	7.00	-0.190	0.314	-1.351	0.618

Results of the correlation analysis shown in Table 2 indicate that greater levels of stress among humanitarian deminers are associated with greater levels of work-to-family conflict and stigma regarding mental health help-seeking. The perceived stress, however, is not connected to their perceived family support and barriers to care. Furthermore, the perceived family support did not correlate significantly with work-to-family conflict in this sample. It seems that family support and work-to-family conflict can both play a role in mental health help-seeking since there is a significant association between greater levels of family support and lower levels of work-to-family conflict with lower levels of stigma and barriers to care. As expected, the correlation analysis showed that stigma and barriers to care correlate negatively with mental health help-seeking.

Table 2. *Pearson correlation coefficients among the variables related to the subjective stress among humanitarian deminers*

	1.	2.	3.	4.	5.	6.
1. Perceived Stress Scale	1	-.152	.559**	.310*	.215	-.168
2. Family Support		1	-.190	-.491**	-.523**	.417**
3. Work-to-Family Conflict			1	.324*	.386**	-.250
4. Perceived Stigma				1	.547**	-.316*
5. Barriers to Care					1	-.342**
6. Probability of mental health help-seeking						1

* $p < .05$; ** $p < .01$

To test whether family support, work-to-family conflict and variables regarding mental health help-seeking can predict levels of stress experienced by Croatian humanitarian deminers, we conducted a multiple linear regression (Table 3). This model turned out to be significant, with mentioned variables accounting for 27.3% of variance of subjective stress among humanitarian deminers. However, only work-to-family conflict turned out to have significant individual contributions to predicting subjective stress in this sample.

Table 3. *Regression analysis testing the individual contribution of variables in predicting subjective stress among humanitarian deminers*

Predictors	Unstandardized Coefficients		Standardized Coefficients	R	Adj. R ²
	b	Std. Error	β		
Work-to-family conflict	0.307	0.072	.534**	.580**	.273**
Perceived family support	0.000	0.006	-.008		

Perceived stigma	0.157	0.122	.184
Barriers to care	-0.086	0.131	-.099
Mental health help-seeking	-0.003	0.049	-.007

* $p < .05$; ** $p < .01$

Discussion

Since demining is a physically and psychologically specific and demanding job, the aim of this study was to explore the relations between the level of subjective stress, family support, work-to-family conflict, perceived stigma, barriers to care and probability of mental health help-seeking in the situation of need among Croatian humanitarian deminers.

This study has shown that the participants did not achieve high scores on the perceived stigma and barriers to care scales, though they did show only medium-level readiness to seek help if faced with mental health issues. One possible explanation for this finding could be inferred from the gender of the participants. According to Vogel (2016), it is possible that the restrictive ideals of traditional masculinity (e.g. strength and stoicism) contradict the emotional vulnerability and communication needed to access and fully engage in effective psychological treatment. The results of this show that work-to-family conflict is present among humanitarian deminers. A possible explanation for this may lie in the very nature of their work. Considering that they spend most of their career separated from their families due to constant fieldwork, which makes it harder for them to excel in their family roles, it is not surprising that the conflict between their work and family roles is high. An increase of the perceived stress level at work is connected to the reduced possibility of satisfying family needs and duties (Nart & Batur, 2014). The results of this study have shown that the distinctive and perilous nature of the work of humanitarian deminers, which includes dealing with high-stress situations on an everyday basis, can have a large impact on family life.

Another finding of this study has shown that high levels of stress are accompanied by higher levels of work-to-family conflict. Workers dealing with higher levels of stress experienced more severe consequences on their family relationships. Such results were expected since similar findings were also found in populations working less dangerous jobs (Nart & Batur, 2014). The expectation that a lower level of work-to-family conflict is connected to better family support (Selvarajan et al., 2013) was not confirmed by this research. It is possible that the deminers, due to the specific demands of their work, are less likely to control the negative interference of work and family relations despite the amount of family support they receive. This might indicate a need for providing workers with better methods of dealing with stress. Such results also go along with other findings about the relationships between work-to-family conflict and factors related to mental help-seeking presented in this study. The results show that those deminers whose family relationships were more affected by their work were more inclined to perceive stigmatization and deem psychological help more difficult to access. Such data suggests that high-risk jobs can disrupt the balance between work and family life and harm the personal integrity of individuals.

Furthermore, the correlation analysis did not confirm our hypothesis about the significant correlation between family support and perceived stress, which is not in line with previous research (Pietrzak et al., 2010). These results could be explained by comparing them to findings obtained from police officers, whose jobs also fall into the category of high-risk occupations. It is shown that police officers often use emotional detachment from their families as a strategy for coping with stress (Glavina & Vukosav, 2011). For this reason, it might be possible that humanitarian deminers employ the same stress-coping strategy, ultimately showing that family support does not play a role in perceiving work-related stress. On the other hand, as the

results of this study have shown, family support could have a role in the maintaining of personal psychological well-being. Humanitarian deminers who received more support from their families also perceived less stigma and barriers to care, which consequently leads to a higher possibility of mental health help-seeking (Clement et al., 2015).

So far, perceived stress was rarely associated with stigmatization for seeking professional psychological help. The reason for the statistically significant correlation between these two variables found in this study could be explained by the identity threat model of stigma by Mayer and O'Brien (2005). According to their model, people who consider themselves stigmatized for seeking professional psychological help estimate that such an act could endanger their social identity, which inevitably affects stress reaction. Based on this model, it can be concluded that, in case of perceived stigmatization, a person will be more stressed when the need for psychological assistance is greater. Another explanation for these results is the increased sensibility of individuals who need psychological help the most when it comes to stigmatization for seeking psychological help (Hoge et al., 2004).

As some findings have shown before (Britt et al., 2008), there are some distracting factors which prevent people from seeking necessary psychological support. This study has shown that, among humanitarian deminers, one such factor is perceived stigmatization. Those deminers who reported greater levels of stress had more internalized negative attitudes towards their own psychological problems. Considering that this way of thinking can directly affect behavior (Vogel et al., 2007), it is not surprising that those who perceived greater stigmatization were less willing to look for it. These findings point to a need for the destigmatization of psychological issues, both in the general population and among humanitarian deminers. Additionally, the role of masculine beliefs could affect the deminers' willingness to seek professional help. In fact, there is evidence that men not only consult mental health professionals less often than women but also that their methods of help-seeking are different. Möller-Leimkühler (2002) found that, although minor emotional symptoms increase the probability of consulting a general practitioner, physical symptoms were the determining factor for help-seeking by men. Corney (1990) also found that, in contrast to women, men are less likely to report psychosocial problems and distress as a reason for consulting.

Finally, as the regression analysis has shown, the only predictor of subjective stress among deminers was work-to-family conflict. For this reason, it is of great importance to both employers and psychologists who work with deminers to address this problem in practice.

The sample used in this research is necessarily purposive, which could also indicate greater motivation among the participants in contrast with those who were unwilling to take part in the study. It should be emphasized that, regarding their workplace, the participants of this research are not homogenous. Taking that into consideration, the participants employed by the Croatian Army could differ from those employed by private companies in their responses, especially when examining the level of perceived stress or work-to-family conflict. Therefore, we suggest that future studies examine whether there are any differences between the humanitarian deminers employed at various workplaces. It is possible that the gathered data could better describe the reality of their work and private lives. Furthermore, future research should investigate the nature of relationships between variables more closely using analyses other than correlation. It could also be beneficial to investigate whether there are any differences in seeking professional psychological help, perceived stigmatization and barriers to care between deminers who have already sought such assistance and those who have not. Since significant correlation between family support and the level of perceived stress was not found (except for that between family support and decision to seek psychological help, which was evident in this study), it would be useful to further study occasions in which family support is expressed and consider its relationship with stress-coping strategies. Contrary to expectations, there was no significant correlation between family support and work-to-family conflict and we deem it necessary to further investigate the reasons behind this outcome. Since there is a presumption of accumulated

stress among employees of similar professions (Atkinson, Guetz, & Wein, 2009), we suggest that research on retired humanitarian deminers be conducted, which could further explain the role of family support in that population.

In order to improve future research, there should be better cooperation between researchers, the Croatian Army and private demining organizations. In doing so, larger samples and more detailed information could be gathered, which could help in expanding research related to this issue. This research is only the beginning of scientific interest for this area of military psychology in Croatia, which also has direct practical implications. There is an obvious need for increasing the visibility of people dealing with high-risk jobs and for reducing the stigmatization and barriers they are facing while seeking professional psychological help.

Conclusion

This research has given insight into the perception of stress, family support, work-to-family conflict and factors related to mental health help-seeking among Croatian humanitarian deminers. The correlation analysis showed significant correlation between subjective stress and work-to-family conflict, while correlation between subjective stress and family support, as well as that between family support and work-to-family conflict, did not prove to be significant. Among the factors related to the seeking of professional psychological help, perceived stigma significantly correlated to subjective stress, while both perceived stigma and barriers to care correlated significantly with family support and work-to-family conflict and were recognized as distracting factors in seeking professional psychological help. Regression analysis has shown significant role of work-to-family conflict in predicting level of subjective stress, while family support, stigma, barriers to care and probability of mental health help-seeking did not turn out to be significant predictors of subjective stress among humanitarian deminers.

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4

Preliminary Findings of a Single Session of Non-Invasive Brain Stimulation over Parietal Lobe and Performance on Spatial Memory Task

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Abstract

Spatial memory relies on efficient encoding, storage and retrieval of spatial information, which enables us to remember paths or locations of objects in everyday life. Moreover, this type of memory has been shown to decline with age and various neurodegenerative disorders. Parietal cortex has been shown to play an important role in the formation of short-term representations of spatial information. The aim of the current study was to test the possibility of immediate and long-term spatial memory enhancement, by increasing excitability of parietal posterior cortex. We used transcranial direct current stimulation (tDCS) over posterior parietal cortex in a placebo-controlled cross-over study. Participants received anodal (1.5 mA) or sham tDCS stimulation over P4 site (10-20 EEG system) for 20 minutes in two separate sessions. Immediately after stimulation, participants completed a spatial maze task, which consisted of learning block, 2D recall, and 3D recall. Spatial memory performance was tested 24 hours and 7 days after stimulation, to assess potential long-term effects. We found no significant effects of anodal stimulation on spatial memory performance either on immediate or delayed recall. This was the case with both, 2D and 3D spatial memory recall. Our results are in line with some studies that suggest that single brain stimulation sessions do not always produce effects on cognitive functions.

Keywords: spatial memory, posterior parietal cortex (PPC), noninvasive brain stimulation, transcranial direct current stimulation (tDCS), spatial cognition

Introduction

Spatial memory involves the encoding, storage, and retrieval of spatial information, which is crucial for everyday life functioning (Allen, 2004). Efficient spatial memory use enables us to remember paths, locate objects in our environment, use maps, etc. Spatial memory is not unitary and it includes many specific cognitive mechanisms for processing different aspects of spatial information e.g. object recognition, spatial orientation, spatial navigation, object location binding, etc. It is important to distinguish between memory for spatial layouts, such as involved in object location memory, and sequential processing of spatial information like a path learning (Schachter & Nadel, 1991). In terms of spatial representations there is a traditionally accepted distinction between allocentric and egocentric spatial frames. During allocentric framing, objects and their locations are being processed in reference to other objects, while egocentric framing includes self-referential processing of spatial information (Burgess, 2006). It is also relevant to differentiate spatial memory from spatial navigation which represents a complex ability to find and maintain a route from one place to another (Allen, 2004).

Neural basis of spatial cognition is highly investigated and there are two brain regions consistently showing substantial role in spatial information processing. The first one is hippocampus which plays a crucial role in all memory processes. Lesion studies showed crucial contribution of hippocampal activity for processes like path learning, accuracy metric in allocentric framing, and object location encoding (Kessels, De Haan, Kappelle, & Postma, 2001). Several theories have been linking hippocampus with spatial memory, assuming hippocampal function as allocentric cognitive map (O'Keefe & Nadel, 1978) or a binding device (Eichenbaum & Bunsey, 1995) integrating different contextual features of information in the environment. The other neural structure involved in spatial memory processes is posterior parietal cortex (PPC). It has been shown that PPC has a crucial role in generation of short-term representations of spatial information (LaBar, Gitelman, Parrish, & Mesulam, 1999; Roy, Sparing, Fink, & Hesse, 2015). PPC is also taking important part in egocentric framing (Bird & Burgess, 2008; Byrne, Becker, & Burgess, 2007), as it has a function of integrating multiple sensory information (Andersen, 1997).

In addition, it has been traditionally suggested that spatial memory functions are strongly lateralized, and that right hemisphere has a key role in spatial processing. Namely, there is evidence that right hippocampus is involved in spatial locations recall (Milner, Johnsrude, Crane, Trans, & Lond, 1997; Smith & Milner, 1989) as in allocentric and egocentric framing in spatial navigation through computerized environment (Antonova et al., 2009). On the other hand, empirical findings about PPC lateralization in spatial memory functions (Baciu et al., 1999; Kessels, Kappelle, Haan, & Postma, 2002; van der Ham, Raemaekers, van Wezel, Oleksiak, & Postma, 2009) reveals bilateral PPC activity, considering two types of spatial relations processing. Although the data are not always consistent it seems that categorical spatial relations are processed mostly in left hemisphere, while right hemisphere seems to be more dominant in coordinate spatial relations processing.

In last two decades, development of non-invasive brain stimulation techniques has enabled targeted enhancement of different cognitive and motor functions in both healthy and clinical populations. The main advantage of this methodology is the possibility to safely (Antal et al., 2017; Grossman, Woods, Knotkova, & Marom, 2019) conduct controllable experiments which can provide causal evidence about neural basis of cognitive functions, unlike correlational neuroimaging techniques and less-controllable lesion studies. In this study, we used transcranial direct current stimulation (tDCS), which is widely used in scientific and clinical purposes (Berryhill & Martin, 2018). This procedure assumes generation of electrical field over the targeted brain area which changes ions distribution of nerve cells in targeted brain region and gives an outcome of few millivolts change of the neuronal resting potential (Stagg & Nitsche, 2011). Thus, application of tDCS gives possibility of increasing cortical excitability of the neurons in specified brain area which leads

to higher probability of neural “firing” of targeted region (Nitsche et al., 2008). Anodal tDCS tends to induce increase of excitability of the underlying neural tissue (Nitsche & Paulus, 2000), which is usually linked with better performance on cognitive measures (Brunoni & Vanderhasselt, 2014; Summers, Kang, & Cauraugh, 2016). It is assumed that physiological mechanisms of tDCS effects lay in modulation of synaptic plasticity of GABA and glutamate systems.

The aim of the study was to investigate the effects of parietal tDCS on spatial memory performance. We tested whether the single-session anodal tDCS over right PPC would enhance spatial memory performance immediately after the stimulation. Furthermore, we performed assessments 24 hours and 7 days later to test for potential long-lasting after-effects.

Methods

Participants

The sample consisted of twenty-two healthy right-handed University students (12 female and 10 male, aged 20-28). Participants were preselected in line with tDCS inclusion criteria (Antal et al., 2017) and all of them were native speakers, with normal or corrected-to-normal vision. None of them reported previous history of head trauma, neurologic or psychiatric disorders. Study was approved by the Institutional ethics board and all participants gave their written informed consent.

Instruments

Transcranial direct current stimulation

The tDCS was delivered by STMISOLA (BIOPAC Systems, Inc., USA), controlled by CED1401 Plus using Signal software (Cambridge Electronic Design, Cambridge, UK), via rubber electrodes (5×5 cm) encased in a pair of saline-soaked electrode sponge pockets. To modulate PPC activity, anode was placed over P4 site of the International 10-20 system of EEG electrode placement, while reference electrode was placed over the contralateral cheek. P4 has been commonly used for targeting right PPC in different tDCS studies (Ghanavati, Nejati, & Salehinejad, 2018; Roy et al., 2015; Wright & Krekelberg, 2014). In the active condition, the 1.5mA constant current was delivered for 20 minutes, with a gradual ramp up/down over first and last 60 seconds, respectively. This procedure conformed to contemporary safety standards and produces no significant adverse effects as shown in multiple studies (e.g. Brunoni et al. 2011; Matsumoto and Ugawa 2017; Nitsche & Paulus, 2011). The sham condition followed the same routine except for the current being administered for only 60 seconds at the beginning and at the end of the treatment (gradual ramp-up/down), making it indistinguishable from the real stimulation (Nitsche et al., 2008). The order of stimulation conditions was counterbalanced across participants (i.e. half of participants first received anodal stimulation, while the other half first received sham).

Spatial memory task

To assess spatial memory performance, we constructed two parallel forms of spatial maze task which consisted of learning block, two-dimensional recall block (2D) and three-dimensional recall block (3D). In the learning block, participants were instructed to memorize three sequentially presented paths on a 7x7 grid, resembling street map. The paths were presented on the computer screen separately and gradu-

ally step-by-step, from starting to the final point, with a one second per step rate. Step was defined as a part of the path which lay between two “crossroads” on the grid. Three paths differed on color (green, purple and blue) and number of the steps (10, 6, 14 respectively). Both forms used the same coloring and number of the steps for each path, but differed regarding to starting and final points. After the third path had been presented, all three paths were simultaneously shown on the screen for three seconds (Figure 1). Before continuing with the next block, a visual noise picture was presented on the screen for two seconds. In the beginning of the 2D recall block, participant was shown a starting point on the grid and instructed to reproduce (step by step) each path by pressing arrow keys on the keyboard. One step of the path or the red letter “X” would appear as a feedback after every correct or incorrect response, respectively. In the 3D recall block participant was presented a computerized 3D maze environment and a color cued starting point to indicate which path was required to reproduce (Figure 2). Participant was moving through the maze by pressing arrow keys on the keyboard. At the moment when participant faced the “crossroad”, red question mark would appear on the screen, forcing him to choose one of three sides of the path. If responded correctly, participant would continue to move through the maze. Conversely, red “X” would appear as a mistake feedback. Final 2D and 3D scores were calculated as a sum of all correct responses that were given without mistakes for all three paths. The highest possible raw score for each condition was 30.

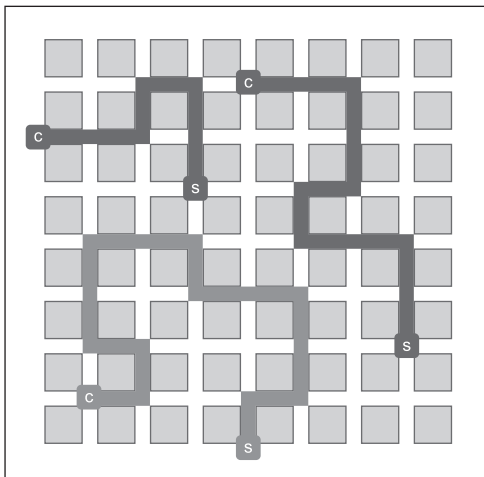


Figure 1 Depiction of three paths in our spatial memory tasks.

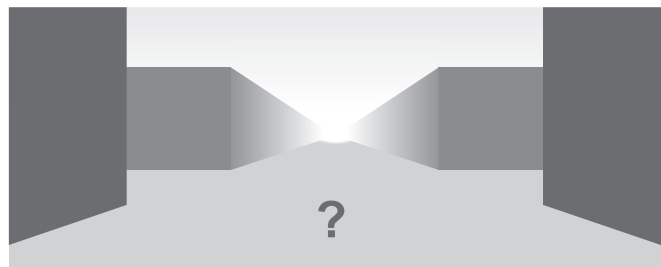


Figure 2 3D spatial memory task computerized environment.

Procedure

Considering type of stimulation, our experiment had two experimental conditions repeated across all participants in the counterbalanced order. For every participant there was a time gap of at least 7 days between the 7-day follow-up test following the first session and the next session, so every tDCS session had the status of a single stimulation session. In one session participants received real stimulation while in the other they received sham stimulation. To assess immediate effects of tDCS treatment, we administered to participants 2D and 3D spatial memory tasks in duration of 15 minutes right after the stimulation. To assess potential long-lasting effects participants performed the same spatial memory task retest 24 hours and 7 days after the stimulation. Learning block was omitted in retest versions of the spatial task. Participants had a quick opportunity to remind the paths before each retest, when all three paths were showed together on the screen for three seconds.

Results

Immediate tDCS effects

Average (both conditions together) raw score of 2D recall immediately after the stimulation was 22.61 (75.4% accuracy), while average raw score of 3D task was 15.30 (51% accuracy). Descriptive statistics of spatial memory performance for each of the experimental conditions are presented in Table 1. Results of 2x2 repeated measures ANOVA (anode / sham; 2D / 3D) showed that 3D recall task was significantly harder ($F(1, 21) = 198.547, p = .00$) than 2D recall task. However, there was no significant effect of tDCS ($F(1,21) = 2.08, p = .164$), nor the significant effect of the task – tDCS interaction ($F(1,21) = 0.152, p = .701$).

Long-term tDCS effects

In order to assess possible long-term effects of tDCS we conducted 2x3 repeated measures ANOVA (anode / sham ; immediate / 24 hours / 7 days) on 2D and 3D scores separately. No significant effects of tDCS were obtained on either 2D recall task ($F(1,21) = 0.012, p = .914$)¹ or 3D recall ($F(1,21) = .159, p = .694$). In spite of slight trend of the average data to show an improvement of the results after 7 days in both 2D and 3D scores following tDCS (while they remained more or less the same in all three measurement following sham), the effect of time did not reach significance level for either 2D task ($F(2,42) = 2.945, p = .064$) or for 3D task ($F(2,42) = 1.202, p = .311$) Finally, there were no significant effects of interactions: $F(2,42) = 2.595, p = .087$; $F(2,42) = 0.780, p = .465$ for 2D and 3D tasks respectively.

Table 1 *Spatial memory performance for all experimental conditions*

Experimental situation	<i>M</i>	<i>SD</i>	ZSk	ZKt
Anodal 2D immediate	22.50	2.65	-2.87**	1.81
Anodal 2D 24 hours	22.18	3.17	-2.58**	2.24*
Anodal 2D 7 days	23.23	3.16	-0.93	-0.30
Sham 2D immediate	23.64	3.05	-0.24	-0.41
Sham 2D 24	21.91	2.56	0.87	0.17
Sham 2D 7 days	22.23	2.74	0.18	-1.06
Anodal 3D immediate	14.50	3.45	-1.92	1.31
Anodal 3D 24 hours	15.59	3.74	0.68	-1.56
Anodal 3D 7 days	16.09	4.15	0.35	-0.27
Sham 3D immediate	15.14	5.04	0.43	-1.18
Sham 3D 24 hours	15.14	4.24	-1.08	0.21
Sham 3D 7 days	15.32	3.76	1.11	-0.22

*= $p < .05$, **= $p < .0$, ZSk = Standardized Skewness, ZKt = Standardized Kurtosis

1 Since two variables used in this analysis (Anodal 2D immediate and Anodal 2D 24 hours) showed non-normal distribution, we additionally conducted Friedman test which also resulted with non-significant differences between all experimental conditions in 2D task ($\chi^2(5) = 4.709, p = .452$). In order to keep uniformity of reporting in this paper we presented results of ANOVA in the main text.

Discussion

In this experiment we examined whether tDCS over right PPC can enhance spatial memory performance in two-dimensional and three-dimensional computerized environment. Additionally, besides immediate effects, we investigated possible long-term effects of tDCS after 24 hours and 7 days. No significant tDCS effects on spatial memory were observed in any of the three time points. This was the case with both 2D and 3D spatial memory recall measures.

Even though tDCS is a promising technique for drawing causal conclusions about the role of distinct brain regions in different cognitive functions there are studies challenging its effects. A recent meta-analysis (Horvath, Forte, & Carter, 2015) suggested that there was no convincing evidence for reliable effects of single session tDCS on cognitive functions in healthy adults. Still, there are several studies reporting significant cognitive enhancement by tDCS (Brunoni & Vanderhasselt, 2014; Hill, Fitzgerald, & Hoy, 2016; Summers et al., 2016). Results of our study do not provide evidence in favor of single session tDCS inducing relevant cortical functional change to affect performance on spatial memory.

On the other hand, there may be other reasons for the lack of tDCS effects in our study. There is consistent evidence about aging related decline in spatial memory functions, especially in allocentric framing. This was confirmed by results of meta-study (Colombo et al., 2017) that showed consistent decline of allocentric framing in healthy older adults. Potential explanation for this phenomenon is attenuated hippocampal activation, both at encoding and retrieval (Antonova et al., 2009). Thus, it is possible that we did not have appropriate sample for tapping these effects. It would be reasonable to repeat this study on a sample of older participants. Another reason of possible attenuation of the effects in this study is the complexity of spatial memory task that has been used. Namely, if performance on that task has been dependent on multiple cognitive processes, it is likely that electrode montage over P4 did not affect all neural structures that have substantial role in performance on our task. Finally, it should be considered that there is stronger empirical evidence about hippocampal role in spatial memory than it is for PPC, and that, due to its sub-cortical anatomical position, hippocampus is practically inaccessible for direct stimulation by non-invasive brain stimulation methods. Nevertheless, there is evidence that noninvasive stimulation of PPC can affect excitability changes in hippocampus by activating cortical-hippocampal brain network (Wang et al., 2014; Wang & Voss, 2015). Thus, it is not clear whether the lack of effects obtained in this study were due to not-strong-enough stimulation of hippocampus or due to the complexity of measure derived from spatial memory tasks that we used, or the combined effect of both. Finally, in the literature that has been published so far not only that there is lack of empirical evidence about effects of non-invasive brain stimulation techniques on human spatial memory, but there are neither many consistent studies about tDCS effects over P4 on cognitive performance in general. Therefore, at present, it is hard to discuss further the meaning of our results. Some of the previous findings reported lack of positive effects of single session anodal tDCS over P4 on working memory (Berryhill, Wencil, Coslett, & Olson, 2010). On the other hand, there is evidence (Bjekić, Čolić, Živanović, Milanović, & Filipović, 2019) for memory performance enhancement by tDCS application over P4. Within this empirical background, our results remain unclear for now; there is certainly a need to reconsider our spatial memory measures and possible different electrode montage in further studies.

Conclusion

To conclude, this study revealed no significant effects of single session tDCS over right PPC on spatial memory performance. Moreover, we did not observe any significant long-lasting effects (after 24 hours and 7 days) of a single tDCS treatment to spatial memory performance. The plausible explanation of the

results we obtained remains unclear. Future studies should focus on using another multiple spatial memory measures and consider alternative electrode montages.

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5

Life Satisfaction Determinants in Older Adults: Do Different Living Arrangements Count?

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Abstract

Life satisfaction is a person's global assessment of subjective quality of life, and an indicator of successful psychological adaptation to the changes and losses a person usually experiences in later life. The study aims to explore the contribution of psychosocial factors to the interpretation of life satisfaction in older persons residing in retirement homes in comparison to the community dwelling older adults. There were 202 participants, of whom 101 were retirement homes' residents in Zagreb, Croatia, 81 years old on average, and 101 were community dwelling persons, on average 79 years old. Participants were mobile and not diagnosed with dementia. The measured variables were the following: sociodemographic, self-perceived health, functional ability, social participation, sleep quality, and life satisfaction. Participants in both groups reported high levels of life satisfaction. No statistically significant differences were observed in life satisfaction nor in self-perceived health between participants' groups. Significant differences were found in sociodemographic variables, functi-

onal ability, sleep quality, and social participation, with retirement homes participants scoring worse than the community dwelling participants, except for better social participation score. Regression analyses confirmed that the observed predictor variables contributed significantly to the explanation of 37% and 30% of life satisfaction variance in retirement homes participants and community dwelling participants, respectively. Different structure of life satisfaction predictors was observed in two participants' groups. The study findings point to the potential improvement of older adults' quality of life, providing psychosocial interventions to enhance the potential of older persons to adapt to challenges of well-being.

Keywords: life satisfaction, older adults, self-perceived health, functional ability, social participation, sleep quality

Introduction

With the prolonged life expectancy in old age, the quality of life becomes an important issue at the individual, family and social policy levels. There is suggestive research evidence that well-being is relevant to health and quality of life as people age (Steptoe, Deaton, & Stone, 2014). Quality of life has become an important concept for the planning of health care and social practices regarding older adults, especially those experiencing diminished control over their lives and the loss of functioning. In addition, some research findings suggest that the older adults living in institutions may be at risk for lower quality of life in comparison to older adults living in community (Mitchell & Kemp, 2000).

Life satisfaction is defined as a person's global assessment of subjective quality of life, or evaluative well-being component (Diener, Emmons, Larsen, & Griffin, 1985; Kaliterna Lipovčan & Prizmić Larsen, 2006; Penezić, 2006; Shin & Johnson, 1978). Lawton's (1991) definition of quality of life for older adults includes components of behavioural competence, such as health, function and social involvement; psychological wellbeing; subjective impression of quality of life, such as life satisfaction; and environmental factors. Life satisfaction is considered one of the indicators of successful psychological adaptation in later life, when a person is usually faced with changes and losses: in health, physical and cognitive functioning, social engagement, and productive activities (Allerhand, Gale, & Deary, 2014; Berg, Smith, Henry, & Pearce, 2007; Smith & Ryan, 2016; Schaie, 2016). Ageing related losses do not seem accompanied by reduced life satisfaction in many people, a phenomenon known as *the paradox of well-being*. However, when the relationship between age and life satisfaction was analysed by combining both individual- and country-level effects, this paradox was only observed in high income countries (Swift et al., 2014), while in the transition European countries, Croatia included, and in low-income countries subjective well-being seems to be decreasing with age (Kaliterna Lipovčan, Brkljačić, Prizmić Larsen, Brajša-Žganec, & Franc, 2018).

Two theories provide a framework for interpreting the findings on life satisfaction in later life. One is the socio-emotional selectivity theory (Carstensen, Fung, & Charles, 2003), according to which people, as they age, accumulate emotional wisdom that leads to selection of more emotionally satisfying events, friendships, and experiences. Thus, despite age related losses, older people may maintain and even increase self-reported well-being by focusing on a more limited set of social contacts and experiences. The other theoretical framework to understand life satisfaction in old age is the selection, optimization and compensation (SOC) model (Baltes, 1997), which regards life satisfaction as the indicator of psychological adaptation in ageing, or as the potential indicator of successful ageing. SOC can be seen as strategies of psychological gains and losses management. Older adults maximize the positive affects related to gains, and minimize the negative affects related to losses by selective investment in achievable, optimal goals and thus they compensate for their losses and limitations. By maintaining the growth-related goals, older adults enhance their life satisfaction, rather than focusing on losses (Gerstorf, Ram, Röcke, Lindenberger, & Smith, 2008; Riediger, Li, & Lindenberger, 2006).

Among the psychosocial variables related to satisfaction with life in older persons, social engagement, self-perceived health, social support, perceived control, depression, and functional ability have arisen as significant factors (Berg, Hassing, McClearn, & Johansson, 2006; Tomas, Sancho, Gutierrez, & Galiana, 2014). Among lifestyle factors, physical activity seems to be the most important link between life satisfaction and health (Steptoe et al., 2014). There is a growing research evidence suggesting that life satisfaction may even be a protective factor in health maintenance, reducing the risk of chronic physical illness and promoting longevity, by way of positive emotions which promote a more active lifestyle and a motivation toward self-care (Carver, Scheier, & Segerstrom, 2010).

Self-perceived or self-rated health measures an individual's perception of their general or age-comparative health using a single question rated on a three- to five-point scale, and providing strong prediction

on disease outcomes and even life expectancy in older adults (Benyamini, 2016). Self-perceived health has often been confirmed as a significant and positive predictor of life satisfaction in older persons (Burton-Jean-gros & Zimmermann-Sloutskis, 2016; Gutierrez, Tomas, Galiana, Sancho, & Cebria, 2013; Reyes Fernández, Rosero-Bixby, & Koivumaa-Honkanen, 2016; Tomas et al., 2014), but not in all research (e.g. Berg, Hoffman, Hassing, McClearn, & Johansson, 2009), so this association still needs to be investigated. In our previous research on life satisfaction predictors in retirement homes' residents in Zagreb, Croatia, the strongest and the only significant predictor of better life satisfaction in the observed set of psychosocial variables was better self-perceived health (Lučanin, Despot Lučanin, Koščec Bjelajac, & Delale, 2017).

Functional ability is a measure of physical independence in performing activities of daily living - self-grooming and chores inside and outside of home (Bowling, 1995). It is also strongly determined by psychological factors (Idler, 1992). The ability to perform daily activities independently may be more important for an older adult's health self-rating than the presence of chronic disease which may not affect their functional ability (Ikegami, 1995). Functional ability enables people to work, socialize, and perform their social roles, which is all important for life satisfaction in older adults (Siedlecki, Salthouse, Oishi, & Jeswani, 2014; Vagetti et al, 2014). Functional dependency has been confirmed to have a significant and negative effect on life satisfaction (Gutierrez et al., 2013; Tomas et al., 2014).

Sleep is one of the fundamental human behaviours. When normal developmental changes in sleep-wake regulation are coupled with developmentally specific medical and psychosocial conditions, many older adults experience impairments in sleep quality (Landry, Best, & Liu- Ambrose, 2015). The usual indices of sleep quality show that sleep in older adults is less consolidated, the frequency and duration of night-time awakenings is increased, there are more problems in initiating and maintaining sleep, daytime sleepiness is increased, there is more daytime napping, and subjective estimation of sleep quality is lower (Bloom et al., 2009; Gadie, Shafto, Leng, & Kievit, 2017; Li, Vitiello, & Gooneratne, 2018; Ohayon, Carskadon, Guilleminault, & Vitiello, 2004). Between 50% and 65% of older adults report poor sleep quality (Li et al., 2018; Neikrug & Ancoli-Israel, 2009; Martin, Fiorentino, Jouldjian, Josephson, & Alessi, 2010). In case of necessity of institutional care, sleep problems can be further exacerbated due to additional environmental factors such as night-time noise and light, nursing activities or roommate's habits and needs (Neikrug & Ancoli-Israel, 2010; Ye & Richards, 2018). The results of our previous study in retirement homes showed that 71% of very old adults reported clinically impaired sleep quality as assessed by the Pittsburgh Sleep Quality Index (Koščec Bjelajac, Despot Lučanin, Lučanin, & Delale, 2019). The preliminary results of our other study indicated that community dwelling older adults estimated their sleep quality significantly better than the retirement home residents (Koščec Bjelajac, Despot Lučanin, Lučanin, Delale, & Štambuk, 2018). However, the elaborate data on the relationship between sleep quality and measures of daytime functioning, including life satisfaction, in Croatian older adults are still lacking.

The association of life satisfaction with social participation, as one of the aspects of social engagement, has been often researched. Social participation is defined as the frequency of one's participation in social, leisure and productive activities, and has been associated with positive emotional and physical outcomes (Berg et al., 2007) in older adults living in institutions and in community (Inal, Subasi, Ay, & Hayran, 2007; Johannesen, Petersen, & Avlund, 2004). Research findings suggest that active engagement with others is beneficial for older adults' life satisfaction to a different degree. Gutierrez et al. (2013) found the active engagement with others to be a key factor strongly associated to life satisfaction in older adults, while Ponce, Rosas, & Lorca (2014) confirmed the social participation association with high levels of subjective well-being in old age, although the strength of this association was moderate and not greater than that with other factors related to life satisfaction, including health status and income. Variations in findings are usually attributed to differences in the researchers' conceptualization and operationalization of the social participation and the life satisfaction.

Regarding sociodemographic factors, research findings point out the inexistence of significant differences in life satisfaction between older men and women (Tomas et al., 2014). The better educated older men were more likely to report satisfaction with income and higher life satisfaction, in the study by White, St. John, Cheverie, Maryam Iraniparast, & Tyas (2015), while Burton-Jeangros & Zimmermann-Sloutskis (2016) found that high education, satisfaction with income, and living with a partner were all positive and significant predictors of life satisfaction in older women.

Changes in demographic situation, social and family structure, and economic status are opening new challenges regarding the care for older people, in most societies. As a result, different institutions for older people have become a significant care option.

Studies have directly compared psychosocial determinants of life satisfaction in older persons living in different environments - in retirement homes and in their own homes. Some studies confirmed lower life satisfaction (Loomis & Thomas 1991), increased depression (Grayson, Lubin, & Van Whitlock, 1995), and higher mortality rates (Stones, Dornan, & Kozma 1989) in older adults living in long-term care institutions compared with community-dwelling older adults, while other studies found higher life satisfaction among frail older adults in nursing homes compared with those receiving home health care in their own homes (Mitchell & Kemp, 2000). Psychosocial variables observed in the present study are the domains of potential loss in old age associated to adaptive functioning. The objective of this study is considering the potential of older persons living in different environments to adapt to well-being challenges.

The aims of the present study were to examine the contribution of psychosocial factors to the interpretation of life satisfaction in older persons residing in retirement homes compared to the community dwelling older adults. First, we intended to test the differences in life satisfaction, self-perceived health, functional ability, social participation, sleep quality, chronic illness, and sociodemographic characteristics of older persons with regards to their living arrangements. Based on the inconsistent findings of other research studies, we expected the differences between participants with regards to their living arrangements would be found in predominantly health-related variables (functional ability, sleep quality, chronic illness) and sociodemographic variables, and no differences would be found in predominantly psychological variables (life-satisfaction, self-perceived health, social participation). Second, we intended to determine the psychosocial predictors of life satisfaction in older persons with regards to their living arrangements. Based on other research findings, we expected that different structure of significant life satisfaction predictors would be determined with regards to participants' living arrangements.

Method and Participants

The research sample consisted of 202 participants. Of those, 101 were residents of 10 retirement homes in Zagreb, Croatia, aged 70-91 years, on average 80.97 years ($SD = 4.420$) and 101 were community dwelling - living in their own home, aged 70-91 years, on average 78.91 years ($SD = 4.152$). Women prevailed in both groups, with 81% women living in retirement homes and 61% women living in their own homes. In retirement homes majority, 55%, were widowed, 17% were married, and 28% were never married nor divorced. Among community dwelling participants, 50% were married, 46% were widowed and 3% were never married nor divorced. In both groups, 50% of participants completed elementary education, greater proportion of retirement homes participants (38%) than community dwelling ones (26%) completed high school, and the proportion of participants with higher education degree was 12% in retirement homes participants, and 24% in community dwelling ones. The majority of participants in both groups reported being diagnosed with chronic illness or condition, 97% in retirement homes participants, and 81% in community dwelling participants. All participants were mobile, and without diagnosis of dementia.

Social workers or head nurses assisted in the participants' selection in retirement homes. They were instructed to approach approximately 10 or more residents, approximately equal number of men and women (if possible), from the following age groups: 65-70, 70-75, 75-80, 80 and older. When approached, the residents were provided with the information on the research procedure and invited to participate, if they accorded with the predetermined criteria: that they were ambulatory, and without diagnosis of dementia. Community dwelling participants were recruited by the snowball method. Trained students were instructed to recruit in their families, neighborhood, and their friends' families, older persons aged 65 years and older, both men and women, who lived at their own home, were ambulatory, and without diagnosis of dementia. When approached, older persons were informed of the research procedure and invited to participate.

Procedures

Data were collected at retirement homes and at participants' own homes, individually by trained interviewers, in the form of a structured interview. The participation was voluntary, and all participants signed their consent to participate in the research. The study was designed and carried out in accordance with the Code of Ethics of the University of Zagreb (2007), Code of Ethics of the Croatian Psychological Chamber (2004) and the Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects (The World Medical Association, 2013).

Instruments

The questionnaire on sociodemographic characteristics comprised general questions, multiple choice and open ended questions, on the participant's age, gender, marital status, education, and health (chronic illnesses and conditions).

The Life Satisfaction Scale (Defilipis & Havelka, 1984) was used to assess global life satisfaction. The scale consists of 8 items measuring the degree of satisfaction with different aspects of life (e.g. "Do you miss company?" or "Are you satisfied with your current life?"), on three-point response scales (1 = *often/mostly no*, 2 = *sometimes*, 3 = *never/mostly yes*). Higher score (total range 8-24) indicates higher life satisfaction. Internal consistency of this scale, measured by Cronbach's alpha, in different samples of older persons in Croatia varied between .73 and .80 (Despot Lučanin, 2003, Lučanin et al., 2017), and in the present study, the scale demonstrated good reliability ($\alpha = .78$).

Self-perceived health was measured by two linearly added items designed for the purpose of this study. Participants rated their general health on five-point response scale (from 1 = *very bad*, to 5 = *excellent*), and compared their subjective health to that of their age peers on three-point response scale (from 1 = *worse*, to 3 = *better*). Higher score (total range 2 -8) indicates better self-perceived health. Pearson's correlation coefficient between the two items in the present study was $r = .48$.

Functional ability was assessed by the Activities of Daily Living Index (Defilipis & Havelka, 1984; Despot Lučanin, 2003). The scale consists of 14 items measuring the degree of independence in performing daily activities (personal care, walking inside and outside of home, basic domestic chores) on four-point response scales (from 1 = *totally dependent*, to 4 = *totally independent*). Higher score (total range 14-56) indicates better functioning. Cronbach's alpha internal consistency coefficient of this scale for older persons in different research in Croatia varied between .91 and .96 (Despot Lučanin, Lučanin, & Havelka, 1997, Lučanin et al., 2017), and in the present study, the scale demonstrated excellent reliability ($\alpha = .94$).

Sleep quality was assessed by means of the Pittsburgh Sleep Quality Index (PSQI) (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). The PSQI measures seven aspects of sleep quality over the previous

month (subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medication, and daytime disturbances), with response values ranging in each domain from 0-3. In this study, we used only the overall measure of sleep quality as indicated by the total PSQI score. Higher score indicates more impaired sleep quality (total range 0–21), and the total PSQI score greater than 5 discriminates poor from good sleepers. The details about the PSQI translation procedure into Croatian language are presented elsewhere (Koščec Bjelajac et al., 2019). Cronbach's alpha internal consistency coefficient of the PSQI on the population of older adults in previous research varied from .67 (retirement homes residents; Koščec Bjelajac et al., 2019) to .69 (community dwelling older men; Spira et al., 2011) or .78 (community dwelling older women; Beaudreau et al., 2012). In the present study on a mixed sample of retirement home residents and community dwelling older adults Cronbach's alpha was .71.

Social participation was rated on the 5-item scale (Despot Lučanin, 2003). The scale measured the frequency of participation in different social activities (cultural, religious, etc.) on three-point response scales (1 = *never*, 2 = *sometimes*, 3 = *often*). Higher score (total range 5–15) indicates more social participation. Cronbach's alpha internal consistency coefficient of this scale for older adults in different research in Croatia varied between .51 and .61 (Despot Lučanin, 2003, Lučanin et al., 2017), and in the present study, the scale demonstrated relatively low reliability ($\alpha = .51$).

Results

Different data analyses were performed: descriptive statistics, testing of group differences' statistical significance by chi-square, t-tests, and one-way analyses of variance, bivariate correlations and multiple regression analyses to determine the associations between observed variables.

Descriptive statistics

The retirement homes participants' group was significantly older than the community dwelling participants' group, by two years on average ($t(200) = 3.41, p < .001$). In retirement homes participants, there were observed statistically significant greater proportions of: women ($\chi^2(1, N = 202) = 9.12, p < .01$), participants with lower and middle education levels ($\chi^2(2, N = 202) = 6.43, p < .05$), participants diagnosed with chronic illness or condition ($\chi^2(1, N = 202) = 13.44, p < .001$), as well as widowed, never married or divorced persons, and smaller proportion of married persons ($\chi^2(2, N = 202) = 37.78, p = .001$), in relation to the community dwelling participants.

No statistically significant differences in life satisfaction were found in relation to retirement homes and community dwelling participants' gender ($F(1,100) = .41, p > .05$, and $F(1,100) = .01, p > .05$, respectively), education level ($F(2,99) = .58, p > .05$, and $F(2,99) = .68, p > .05$, respectively), marital status ($F(2,99) = .18, p > .05$, and $F(2,99) = 3.30, p > .05$, respectively) and health status ($F(1,100) = .81, p > .05$, and $F(1,100) = 2.00, p > .05$, respectively).

The majority of variables' distributions were significantly skewed, confirmed by the Kolmogorov-Smirnov test (all at $p < .01$), except for the sleep quality variable in the retirement homes' participants. Normalization of distributions was not performed since there were no extreme skewness cases, and it would interfere with further interpretation of the associations among variables (Tabachnick & Fidell, 2007).

Table 1 Descriptive statistics for the observed variables (retirement homes $n = 101$, community dwelling $n = 101$)

	Living arrangement	<i>M</i>	<i>SD</i>	Min	Max	<i>t</i>
Life satisfaction	Retirement home	19.12	3.67	8	24	0.90
	Community dwelling	19.57	3.53			
Self-perceived health	Retirement home	5.11	1.40	2	8	-1.94
	Community dwelling	5.48	1.28			
Functional ability	Retirement home	41.49	9.77	14	56	-7.71**
	Community dwelling	50.85	6.91			
Sleep quality	Retirement home	8.53	4.28	0	21	3.44**
	Community dwelling	6.52	4.01			
Social participation	Retirement home	8.19	2.37	5	15	2.13*
	Community dwelling	7.55	1.80			
Age	Retirement home	80.97	4.42	70	91	3.41**
	Community dwelling	78.91	4.15			

Note. ** *t*-test is significant at the .01 level (2-tailed); * *t*-test is significant at the .05 level (2-tailed).

On average, participants in both groups reported rather high life satisfaction (Table 1). In both groups, the majority of participants, 82%, of both retirement homes participants and community dwelling participants, rated their life satisfaction higher than theoretical scale average. No statistically significant differences were observed in life satisfaction ($t(200) = -.90, p > .05$) between retirement homes participants and community dwelling participants.

Participants from both groups on average perceived their health as good, with 71% of retirement homes participants and 81% of community dwelling participants, rating their health higher than theoretical scale average (Table 1). No statistically significant differences were observed in self-perceived health ($t(200) = -1.94, p > .05$) between retirement homes participants and community dwelling participants.

In retirement homes participants, more than half (54%) were quite independent in their daily functioning, but 12% could function in most daily activities only with others' assistance (Table 1). In community dwelling participants, 92% were quite independent, and only 2% depended on others' assistance. Retirement homes participants' mean scores indicated their statistically significant lower independency in daily functioning compared to community dwelling participants ($t(200) = -7.71, p < .001$).

Overall sleep quality in participants was on average impaired (Table 1). There were 73% of retirement homes residents and 50% of community dwelling participants who reported serious difficulties with their sleep quality (i.e. score greater than 5). Retirement homes participants' mean scores indicated their statistically significant more impaired sleep quality in comparison to community dwelling participants ($t(200) = 3.44, p < .001$).

Participants' social participation frequency was low in both groups: 74% of retirement homes residents, and 87% of community dwelling participants rarely participated in different social activities (Table 1). Retirement homes participants' mean frequency of social participation was statistically significantly higher in comparison to community dwelling participants ($t(200) = 2.13, p < .05$).

In summary, our results showed rather high life satisfaction and good perceived health in both groups of participants with no statistically significant differences. However, retirement homes participants reported lower independency in daily functioning and more impaired sleep quality but more social

participation compared to community dwelling participants.

Prediction of participants' life satisfaction

Table 2 Correlation coefficients (Pearson's *r*) between the observed variables (retirement homes *n* = 101, community dwelling *n* = 101)

	Life satisfaction	Self-perceived health	Functional ability	Sleep quality	Social participation	Age
Life satisfaction		.50**	.28**	-.45**	.16	-.10
Self-perceived health	.50**		.43**	-.39**	.16	.00
Functional ability	.38**	.59**		-.35**	.23*	-.04
Sleep quality	-.31**	-.41**	-.24*		-.01	.11
Social participation	.40**	.43**	.41**	-.16		-.15
Age	-.01	.14	.04	.03	-.17	

Note. Above - the diagonal correlations for the retirement homes participants; below - the diagonal correlations for the community dwelling participants. ** Correlation is significant at the .01 level (2-tailed). * Correlation is significant at the .05 level (2-tailed).

Correlation coefficients between the observed variables were moderate, in both participants groups, ranging from $r = .23$ to $r = .60$ (Table 2). Participants' age did not significantly correlate with any of the observed variables.

Table 3 Summary of the hierarchical regression analyses results: Predictors of life satisfaction in retirement homes participants (*n* = 101) and in community dwelling participants (*n* = 101)

Predictor Variables / Regression coefficients	Retirement homes β	Community dwelling β
Age	-.06	-.01
Gender	.14	.05
Education	-.03	.06
Chronic illness	-.09	-.07
Self-perceived health	.37**	.28*
Functional ability	.00	.11
Sleep quality	-.35**	-.14
Social participation	-.08	.23*
<i>R</i>	.60	.54
<i>R</i> ²	.37	.30
<i>F</i> (8,96)	6.57**	4.28**

Note. ** $p < .01$, * $p < .05$. The table shows the second step results of the hierarchical multiple regression analyses.

Contribution of the observed predictor variables: participants' age, gender, education, chronic illness, self-perceived health, functional ability, sleep quality and social participation, to the prediction of life satisfaction, as the criterion variable, was determined by the hierarchical multiple linear regression analyses, for each of the participants' groups. In the first step, sociodemographic predictor variables: participants' age, gender and education, as well as the chronic illness variable were entered. In the second step, the remaining predictor variables were entered: self-perceived health, functional ability, sleep quality and social participation, while controlling for sociodemographic and chronic illness variables.

In retirement homes participants (Table 3), in the first step, there were no significant contributions of sociodemographic and chronic illness as predictor variables ($R^2 = .03$, $F(5,95) = .67$, $p > .05$). However, the set of variables entered in the second step accounted for 37% of the life satisfaction variance ($R^2 = .37$, $F(5,95) = 6.57$, $p < .001$). While controlling for sociodemographic and chronic illness variables, better self-perceived health and better sleep quality (lower score) predicted higher life satisfaction.

In community dwelling participants (Table 3), in the first step, there were no significant contributions of sociodemographic and chronic illness as predictor variables ($R^2 = .04$, $F(5,95) = .85$, $p > .05$). In the second step, the observed set of variables accounted for 30% of life satisfaction variance ($R^2 = .30$, $F(5,95) = 4.28$, $p < .001$). While controlling for sociodemographic and chronic illness variables, better self-perceived health and more frequent social participation predicted higher life satisfaction.

Discussion

In the present research, two groups of older participants – retirement homes residents and community dwelling older adults were compared in their life satisfaction with regards to other associated variables: self-perceived health, functional ability, sleep quality, social participation and sociodemographic characteristics.

Two groups of participants were significantly different in majority of sociodemographic variables, as expected. Retirement homes participants were, on average, two years older, and comprising a greater proportion of women, lower educated persons, widowed persons, and persons with chronic illnesses, in comparison with community dwelling participants. The profiles of these characteristics typically indicate that retirement homes participants were a more vulnerable group, and thus more at risk for lower well-being.

Regarding other observed variables, the findings confirmed our expectations that the differences between participants with regards to their living arrangements would be found in predominantly health-related variables (functional ability, sleep quality), and no differences would be found in predominantly psychological variables (life satisfaction, self-perceived health), but the expectation was not confirmed for the social participation variable (Table 1).

Retirement homes participants reported lower independency in their daily functioning compared to community dwelling participants, which is an expected finding because impaired functioning is one of the most important reasons for relocating to an institution in old age (Fornara & Manca, 2017). Moreover, sleep quality in retirement homes participants was significantly more impaired in comparison to community dwelling participants (Table 1). This finding is probably most related to their chronic health conditions that can be disruptive for sleep quality (Li et al., 2018), but may also be related to the institutional environment, e.g. night-time light, nursing activities or roommate's behaviour (Neikrug & Ancoli-Israel, 2010; Ye & Richards, 2018).

However, no significant differences in average life satisfaction were found between the two participants' groups – their self-rated life satisfaction was rather high, regardless of their sociodemographic

characteristics, and of their living arrangements (Table 1).

In a similar way, both participants' groups perceived their health on average as good, with no significant differences found (Table 1), regardless of the high proportion of chronically ill persons in both groups (97% in retirement homes participants, and 81% in community dwelling participants). Our results are in line with the other studies' results. Namely, self-perceived health is a well-known psychological phenomenon not strongly correlated to objective health status of older adults (Benyamini, 2016). Unless a chronic illness severely disrupts functional ability of older persons, they perceive their health as good, as well as their quality of life (Idler, 1992; Smith, Young, & Lee, 2004).

The average social participation frequency was rather low in both groups, even though they lived in the socially stimulating environments. Interestingly, retirement homes participants reported engaging in social activities significantly more frequently in comparison with community dwelling participants, probably because many different social activities were offered at their place of residence, and maybe also because of the greater proportion of widowed and never married or divorced persons in this group. These assumptions are in accordance with the Socio-Emotional Selectivity Theory by Carstensen (1995). The older adults in retirement homes may have more control of selecting social engagement that provides positive emotions and support, and thus they maintain and even increase their self-reported well-being.

Other studies comparing life satisfaction in older adults in different living arrangements have displayed conflicting findings. Mitchell and Kemp (2000) found that older adults living in long-term care institutions reported lower life satisfaction and increased depression, compared with community-dwelling older adults. Rodriguez-Blazquez et al. (2012) found significant differences between institutionalized and community dwelling older adults in most observed variables, except for the life satisfaction, similar to our findings. Although retirement homes participants in present research were a more vulnerable group (older, more functionally impaired etc.), institutions can often compensate for the loss of functional capacity (Asakawa, Feeny, Senthilselvan, Johnson, & Rolfson, 2009), and can provide a stable and supportive environment which is important for older persons' sense of subjective well-being.

Since life satisfaction in our research was similarly high in two participants' groups despite their differences in most observed variables, we were interested in analysing the structure of life satisfaction predictors in two different groups of participants.

The observed predictor variables significantly contributed to the explanation of life satisfaction in both participants' groups (30% in community dwelling and 37% in retirement homes participants) (Table 3). Somewhat different structure of life satisfaction predictors was observed in two participants' groups. In retirement homes participants, higher life satisfaction was predicted by better self-perceived health and better sleep quality, which indicates their focus on psychological and health related factors in their subjective well-being evaluation. Sociodemographic variables and the chronic illness variable were controlled for but did not display any significant effects in these multivariate associations in both participants' groups.

Since subjective well-being along with physical functionality are among major determinants of health outcomes in older people, these areas represent key targets for intervention (Ní Mhaoláin et al., 2012). Healthy sleep is an important aspect of healthy human functioning across the lifespan. The results of our study support the findings summarised by Li et al. (2018) that age related changes in sleep quality depend heavily on physical, social and environmental health status. In the present research, this relationship was manifested through different contribution of sleep quality to the prediction of overall life satisfaction in older adults living in different housing arrangements. The results of other studies showed that adults requiring different levels of professional assistance in daily living had more impaired sleep quality than fully independent community dwelling older adults (Kume et al., 2016; Martin, Alam, Harker, Josephson, & Alessi, 2008). Assistance in the activities of daily living is usually needed in older persons experiencing multiple medical conditions and the resulting multiple medication, as well as limited social support, which are all

factors contributing to sleep quality deterioration (Martin et al., 2010; Miner & Kryger, 2017). Residents of nursing homes are generally older than community dwelling older adults, and their functional ability (and health) are generally more impaired, which was also the case in our sample. In older adults, sleep problems and impairments do not necessarily have to be present, or if present, they can be experienced as normal and acceptable part of the aging process. Therefore, in relatively younger, healthier community dwelling older adults, factors other than sleep quality contribute to the experience of their life satisfaction.

In community dwelling participants, higher life satisfaction was predicted by better self-perceived health and more frequent social participation, which indicates their focus on psychological and psychosocial factors in the evaluation of their subjective well-being (Table 3). It has been confirmed by different research that active socialization and engagement in meaningful occupational activities contribute to life satisfaction (Dahlan, Nicol, & MacIver, 2010). Johannesen et al. (2004) found that in community dwelling older adults, complaints about growing old reflected their resentment at experiencing restrictions in their socially engaged life, and in nursing home residents, positive affect, which is also a component of subjective well-being, was associated with their involvement in different activities. They suggest it is valuable to measure whether it makes a difference for life satisfaction in older adults living in the community or in an institution if they are using available resources to engage in activities or not.

Age displayed no significant effects with life satisfaction in present research. This may be due to a small sample size, but it is also the usual finding in cross-sectional research (Gerstorf et al., 2008).

Older adults in this research attached more importance to those domains of functioning that would ensure higher life satisfaction in their specific living conditions – an institution or one's own home. Brown (1995) interprets the relationship of older adult's adaptive behaviour and subjective well-being in his urban ecological model of ageing. The older person's well-being is in "a state of balance" provided that their needs are met with respect to the demands from the surrounding environment. Studies have reported high inter-correlation between residential satisfaction and psychological well-being in the context of older persons' housing needs (Lawton, 1983; Phillips, Siu, Yeh, & Cheng, 2005).

The main contribution of the present research is that findings support the adaptive processes view of life satisfaction and its determinants, in accordance with the Selection, Optimization and Compensation (SOC) model (Baltes, 1997). The participants enhanced their life satisfaction by focusing on domains of functioning that would ensure higher life satisfaction in their specific living conditions, e.g. self-perceived health, sleep quality or social participation, rather than focusing on losses, e.g. in health, social network etc.

The implications of this study are in the potential for the improvement of older adults' quality of life, first by identifying the most vulnerable individuals or groups. Next, the provision of psychosocial interventions would enhance the potential of older persons to adapt to well-being challenges, adjusted to their living arrangements and taking into account their psychological, physical, and social resources. Although the majority of older adults usually express desire to remain in their own homes rather than relocate to an institution, described as the "ageing in place" concept by the current ageing policy (Wiles, Leibing, Guberman, Reeve, & Allen, 2012), interventions may improve their subjective well-being in both environments, based on their individual functioning and needs.

Some limitations of the present research should be acknowledged. This was a cross-sectional correlational study, which implies the impossibility of identifying causal relationships among the observed variables. The participants' samples were the convenience ones, so the generalization of findings to Croatian older population is limited. All assessment instruments were self-report measures, and it is possible that other forms of assessment would have led to different conclusions.

Based on the presented findings and potential limitations, future research needs have been highlighted. First of all, participants' samples should be enlarged, with wider age range, to explore the association of age and life satisfaction. Future research might combine mixed method approach, in order to explore

in depth how sleep quality associates with institutional routine and life satisfaction in residents. Moreover, the quality and quantity analyses of different social participation activities could be compared in retirement homes and participants' own homes, since it was differently associated with life satisfaction of participants in two living arrangements. Other psychosocial factors related to subjective well-being should also be explored, namely participants' social network and social support. Finally, raising the awareness of significant contributors to life satisfaction and needs of older adults living in institutions or community dwelling could promote the development of prevention and treatment plans, and interventions for older adults.

Conclusions

The present research aims were to examine the contribution of psychosocial factors to the interpretation of life satisfaction in 202 older persons, retirement homes' residents in Zagreb, Croatia, compared to community dwelling older adults.

Firstly, the differences in the life satisfaction level of older persons with regards to their living arrangements were determined. Participants in both groups reported rather high levels of life satisfaction. No statistically significant differences were observed in life satisfaction nor in self-perceived health between participants' groups. Significant differences were found in sociodemographic variables, in functional ability, sleep quality, and social participation, with retirement homes participants' scoring worse in comparison to community dwelling participants, except for better social participation score.

Secondly, the observed predictor variables contributed significantly to the explanation of 37% and 30% of the life satisfaction variance in participants with regards to their living in retirement homes or community dwelling, respectively. Different structure of life satisfaction predictors was observed in two participants' groups. In retirement homes participants, higher life satisfaction was predicted by better self-perceived health and better sleep quality, indicating their focus on psychological and health-related factors in evaluation of their subjective well-being. In community dwelling participants, higher life satisfaction was predicted by better self-perceived health and more frequent social participation, which indicates their focus on psychological and psychosocial factors in the evaluation of their subjective well-being.

The findings support the adaptive processes view of life satisfaction and its determinants, in accordance with the Selection, Optimization and Compensation (SOC) model (Baltes, 1997). The participants enhanced their life satisfaction by focusing on domains of functioning that would ensure higher life satisfaction in their specific living conditions.

The study implications are in the potential improvement of older adults' quality of life, providing psychosocial interventions to enhance the potential of older persons to adapt to well-being challenges, adjusted to their living arrangements, and based on their individual functioning and needs.

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6

Reading Habits of Croatian Citizens

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Abstract

The study aims to investigate reading habits of Croatian citizens. We are interested in how often people read books, where they like to read, and how often and what content they read on electronic devices. In addition, we are interested in how many people are enrolled in public libraries, and how often they borrow books from those libraries.

We conducted a field survey on a nationally representative random sample of 750 adult participants (18 years and older) (356 men and 394 women).

Our results show that almost one third of Croatian citizens never read books, and 6% of them read almost every day. Most often they read at home, but also out in the open – on the beach or in a park. Almost two thirds of participants own electronic devices that can be used for reading and what they most often read on them are daily newspapers, web portals, blogs and magazines, and only rarely electronic books. Only a third of participants are enrolled in public libraries, and fewer than half of those participants often borrow books from libraries.

As for gender differences, our results show that women read more often than men, and are also more often enrolled in public libraries. There are no age differences found in reading habits.

Keywords: reading habits, Croatia, books, e-books

Introduction

At its most simple level, reading can be defined as decoding of written language. It is an activity we can engage in anytime and anywhere. However, written language can be very different in terms of complexity – one can read a nutrition facts label on a can of beans, a Facebook status, a poem written by a 7-year old child or a novel by a world famous novelist. At a more elaborate level, reading can be defined as a process of deriving meaning from a written text. This process is described as a cognitive experience, but also as a communication and creative activity (National Strategy for Encouraging Reading, 2017).

Reading is a skill most often acquired in childhood, in the first grades of primary school. It is not a static skill that remains unchanged throughout life, but rather a skill that can be further developed at any life stage (Willms & Murray, 2007). Researchers who study reading focus on different aspects of this skill, such as the emerging literacy skills and their development, reading impairments or reading comprehension (Cunningham & Stanovich, 1991; Stanovich, 2000). Another way to study reading is through its impact on practically all aspects of our lives. Research shows that reading books affects one's empathy (Bal & Veltkamp, 2013), theory of mind (Kidd & Castano 2013) and personality (Yahaya, Mohamed, & Ismail, 2012). When we read fiction, we create mental simulations of social experiences described in the book, we get transported into the mental lives and emotional experiences of the characters, and such transportation is related to better empathy (our ability to understand or feel what another person is experiencing, from that person's perspective), as well as to better social skills in real life (Mar, Oatley, Hirsh, de la Paz, & Peterson, 2006). Furthermore, people who read fiction have better quality social networks (Billington, 2015), better mental health and improved well-being (The Reading Agency, 2015), they are less lonely (Toepoel, 2013) and less depressive (Billington, 2015). Interestingly, that is the opposite of how "book nerds" are usually perceived by the general public.

Reading also improves vocabulary size (Frijters, Barron & Brunello, 2000), verbal fluency (Stanovich & Cunningham, 1992), reasoning, concentration, as well as critical thinking skills (Stanovich, West, & Harrison, 1995; Stanovich & Cunningham, 1992; Wolf & Barzillai, 2009). One study even showed that elderly people who read an average of 30 minutes a day have a 20% survival advantage compared to people who don't read books, or read magazines (Bavishy, Slave & Levy, 2016). The authors explained those results through the effect of a cognitive mechanism.

Apart from reading benefits for an individual, there are also reading benefits for the society as a whole. Research shows that better reading literacy has a positive effect on engaging in higher education and life-long learning and, what's also important, on being an active member of the society. The level of literacy is related to family income and thus to economic growth of the country, quality of work, mobility and employment (Murray & Shillington, 2011). In addition, low literacy rates are linked to poverty and crime (Ivanova, 2011).

The question of how much people read is the basis of studying reading habits. In other words, research on reading habits most often entails reporting on reading frequency, reading amount, or reading activity (Schmidt & Retelsdorf, 2016). There are several ways to investigate this matter through self-report, the most elaborate one being the use of reading diaries (Allen, Cipielewski, & Stanovich 1992). Although this method is very informative, it is also very time consuming and often prevents researchers from reaching a larger number of participants. The simplest method is to ask the participants directly how many books they read in a specific period. This method, however, is not very reliable, because people sometimes have difficulties remembering the exact number of books they have read. Another thing we need to consider is the tendency to give socially desirable answers, since reading tendency is often related to intelligence and refinement (West, Stanovich & Mitchell, 1993). It was for that reason that Stanovich and West devised the Author Recognition Test (ART) to measure print exposure (Stanovich and West, 1989). Participants are

given a list of real and made-up names, and their task is to choose those that they recognize as the names of book authors. They are discouraged from choosing the ones they are not sure about because they are told there are negative points for wrong answers. This measure doesn't indicate the exact number of books a person has read, but it does give us information on the extent to which a person has been exposed to books and reading surrounding and this tendency is positively related to book reading (West, Stanovich & Mitchell, 1993). Another way to investigate reading habits is by the comparative reading habits method (Acheson, Wells & MacDonald, 2008). This method consists of asking participants how much time they spend reading, how much they enjoy reading, how fast they read and how complex their reading materials are compared to their peers. The logic of this comparison stems from research on social comparison, which shows that such self-reported comparative judgements can be more accurate than the ones that don't include such comparisons (e.g. Bandura, 1997).

Reading habits and their outcomes in adult population, especially regarding people's psychological well-being, have not been systematically investigated in Croatia, but their importance is becoming more recognized. In November 2017, the Croatian government adopted the National Strategy for Encouraging Reading, which aims to "develop the reading culture and allow for greater number of Croatian citizens to read with pleasure and understanding" (National Strategy for Encouraging Reading, 2017, p. 5). As for research on reading habits of Croatian citizens, most data come from a continuing research on reading habits and book sales rates conducted annually since 2011 by the Croatian branch of GfK (Growth from Knowledge) agency specialized in market research. The data show that approximately one half of Croatian citizens (from 47% in 2016 to 56% in 2011 and 2018) report reading at least one book in the past year (Book Market Research in Croatia, 2018). Although this research is conducted on a representative sample of Croatian citizens (N=1000), the information about the sample characteristics and the sampling procedure are scarce, since the data have never been published in a scientific paper.

One of the strategic goals of the Croatian National Strategy for Encouraging Reading is to establish an efficient social framework for reading support. We feel that the scientific data on reading habits of Croatian citizens are an important input for the development of specific strategies for achievement of that specific goal. This is precisely why this preliminary study aims to provide data that could be used to develop programs aiming at encouraging reading in the most vulnerable groups of citizens, in accordance with the Croatian National Strategy for Encouraging Reading.

In this research we aim to investigate the reading habits of Croatian citizens. We also aim to describe the group of participants who are frequent readers and the group of participants that report reading books very rarely or never, in terms of their age, gender, education level and the county they live in. We report the data from a survey on a nationally representative sample of Croatian citizens. To investigate reading habits, we have employed a self-report measure of reading frequency and the comparative reading habits method. Furthermore, we aim to investigate the use of libraries as means of providing easier access to reading material. Finally, we investigate reading habits as regards the use of digital media. This aspect is particularly important when it comes to creating strategies for encouraging reading, because we live in a digitally saturated world. If there are no well-developed reading habits in a population, reading is more in danger to be simply neglected due to digital media use.

Methods

Research questions

The research questions we want to answer are how often Croatian citizens read, where they read, whether they are enrolled in public libraries, whether they read from electronic devices, and, if yes, what content they read from such devices. We also look at the possible age and gender differences in regard to those research questions.

Procedure

The results reported here come from a larger study on the attitudes and opinions of Croatian citizens on social processes, named “Pilar’s Barometer of Croatian Society“, which was carried out by the Institute of Social Sciences Ivo Pilar, from 15 April to 15 May 2016, on a representative sample of 750 adults (18 years and over). The study was approved by the Ethics Committee at the Ivo Pilar Institute.

The sample was stratified in multiple stages, and units were randomly selected within each strata. It included all Croatian counties, and the settlements in the counties were classified according to the formal criteria of settlement types. The survey was conducted in 102 chosen settlements (143 sample points). At each sample point, the households chosen to be part of the survey were selected randomly from a list of addresses, and the respondent in each household was determined according to the next birthday method.

All the participants were assured of the anonymity and confidentiality of their responses. They were explained the manner in which they were randomly chosen as participants, the purpose of the study and the way the data would be used. After the survey was finished, the participants were given an opportunity to mix their questionnaire, which contained no personal information, with other questionnaires.

Participants

Participants were 356 men (47.5%) and 394 women (52.2%). Participants were asked to report the year of their birth, and based on that data we created the age groups that were later used for analysing the data. The number of participants in each age group is shown in Table 1.

Table 1 *Number and percentage of participants according to age*

Age in years	N (%)
18 to 30	168 (22.4%)
31 to 40	126 (16.8%)
41 to 50	141 (18.8%)
51 to 60	138 (18.4%)
61 to 70	87 (11.6%)
71 and older	90 (12%)
Total	750 (100%)

As for education levels, almost one quarter of the participants was low-skilled ($n=191$, 25.5%),

more than half of them were medium-skilled ($n = 418$, 55.7%), and high-skilled participants were least represented ($n = 141$, 18.8%).

Questionnaire

In order to investigate the research questions we were interested in, we constructed a series of questions about reading habits. The first question was how often participants engaged in different activities, one of which was reading (fiction, fine literature). Participants gave their answers on a scale from 1 – *never* to 8 – *every day*. The next two questions were intended for participants whose answer to the previous question indicated that they read at least on some occasions. We first asked them how much they enjoyed reading compared to other people they know. The answers were given on a scale from 1- *a lot less*, to 5 – *a lot more*, and there was also an option to choose the “*I don't know*” answer. The following question was where they most liked to read. Possible answers were: a) *at home*; b) *at work, school or university*; c) *in a library*; d) *outdoors (in a park, at the beach, on a field trip)*; e) *in a cafe or a similar surrounding*; f) *in public transportation*; g) *somewhere else*. As for enrollment in public libraries, the participants were asked if they are enrolled in a public library with possible answer options: a) *no*; b) *yes, but I rarely take out books*; c) *yes, and I often take out books*.

To investigate if and how often they use electronic devices (smartphone, tablet, computer, e-reader) for reading, we asked the participants whether they owned such a device. Those that did were then asked how often they used them to read electronic books (fiction), professional literature (for work or study), daily newspapers and web portals, blogs or magazines. Their answers were given using a scale from 1 – *never* to 4 – *regularly*, separately for each type of content.

We also collected data on the highest level of education obtained (low-skilled, medium-skilled or high-skilled education level) and on the county in which the participants live.

Analyses

All the analyses were done using the Statistical Package for Social Sciences (SPSS) for Windows, version 21 (IBM Corp., 2012). As the distribution of the results differed from normal and data were collected using ordinal scales, the Spearman rho correlation coefficients were used to calculate correlations between the measures and the Mann Whitney U-test was used to evaluate gender differences in those variables. χ^2 test was used for testing relationships between categorical variables.

Results

The first question that we wanted to answer was how often Croatian citizens read and what defines the readers subgroup. The results show that an alarming third of Croatian citizens never read (30.8%), while another third of them read once or a few times a year (30.3%). The remaining third of participants can be described as the readers subgroup, with 6.2% of participants reading almost every day, and 19.3 % and 13.4% reading on a monthly or weekly basis, respectively. There is a significant positive correlation between the reported reading frequency and how much participants enjoy reading (Spearman's $\rho = .501$, $p = .000$). The measure of reading enjoyment was used to explore the convergent validity of the self-report measure of reading frequency and the positive correlation between these measures confirms this validity.

When we look at the age of our readers subgroup (persons who read at least on some occasions), we notice that there are represented readers from all age groups (Table 2).

Table 2 Number and percentage of participants according to age who read at least on some occasions (reader subgroup), those who read at least once a week or more often (frequent reader subgroup) and those who never read

Age groups	Participants who read at least on some occasions <i>n</i> (%)	Participants who read at least once a week or more often <i>n</i> (%)	Participants who never read <i>n</i> (%)
18 to 30	124 (24%)	31 (21.2%)	44 (19.0%)
31 to 40	95 (18.4%)	27 (18.5%)	31 (13.4%)
41 to 50	99 (19.2%)	27 (18.5%)	42 (19%)
51 to 60	94 (18.2%)	30 (20.5%)	44 (19%)
61 to 70	55 (10.7%)	17 (11.6%)	31 (13.4%)
71 and older	49 (9.5%)	14 (9.6%)	39 (16.9%)
Total	516 (100%)	146 (100%)	231 (100%)

To further investigate the relation between the readers' age and reading frequency, we calculated non parametric Spearman rho correlation coefficients because the distribution of the results differs from normal (Kolmogorov-Smirnov test was .149 and .179, $p=.000$ for age and reading frequency respectively) and the data come from ordinal scales. Results point to a significant but low negative correlation (Spearman's rho=-.088, $p=.016$), showing that the older the participants are, the less often they read. Furthermore, there is a significant positive correlation between reading frequency and the level of education (Spearman's rho=-.211, $p=.000$) in the readers subgroup, with higher educated participants reporting that they read more often.

As for gender differences, the Mann Whitney *U*-test test shows that women read more often than men (Mean rankwomen=402.95, Mean rankmen=341.86, $M-W U=58183.500$, $p=.000$).

Who reads most?

We were particularly interested in the subgroup that can be described as frequent readers – people who read on a weekly basis or every day. There were 146 participants (19.5%) who read at least once a week or more often. Two thirds of them (63%) are women, 32.9% are high-skilled, and 39.7% are under 40 years of age. A more detailed distribution according to age is shown in Table 2. As for their education level, the participants are most often have medium-skilled (55.5%), a third of them are high-skilled, and only 11.6% are low-skilled as the maximum level of education obtained. Almost one third of frequent readers (28.8%) live in the capital city of Croatia – Zagreb. In terms of the number of frequent readers, Zagreb is followed by Split-Dalmatia County (9.6%) in the second, and Primorje-Gorski Kotar County (7.5%) in the third place. There are some counties that have no frequent readers at all, e.g. Šibenik-Knin, Koprivnica-Križevci and Bjelovar-Bilogora County.

Who doesn't read?

There are 231 participants who never read (30.8%). This group includes more men (58.4%) than women (41.6%). A more detailed distribution according to age is shown in Table 2, but all age groups are represented. When we look at the maximum education level obtained, nearly a half of participants who don't read are medium-skilled, 42.9% of them are low-skilled, and only 7.8% are high-skilled. Most non-readers

live in Zagreb (11.3%), Split-Dalmatia County (8.2%) and Zagreb County (8.2%), and the fewest non-readers live in Istria (3%) and Dubrovnik-Neretva County (1.7%).

Where do they read?

We were also interested in where people read the most, and the results show that 75.4% of participants who read at least on some occasions prefer to read at home. For 6.8% of participants the favorite reading place is out in the open – at the beach, in a park, on a field trip or alike. Around 2% or less say they most like to read at work or at university, in the library, in a café or in public transportation.

Public libraries

As for enrollment in the public libraries, a half of participants in the reading group is not enrolled in public libraries (52.1%). From the other half, 25.3 % rarely take out books and 115 participants or 22.3% of the reading subgroup take them out regularly. Gender analyses show that among those who read at least on some occasions, there are more women enrolled in libraries than men (Table 3).

Table 3 *Number of participants who read at least on some occasions and are enrolled in public libraries, according to gender*

		Not enrolled in libraries	Enrolled in libraries	
Gender	Male	136	82	$\chi^2=15.616, p=.000$
	Female	133	164	

To see how enrollment in public libraries is related to age, we created two age groups. The first one included all the participants from 18 to 50 years of age, and the second one included all the participants aged 51 and older. Results (Table 4) show that older participants are less often enrolled in public libraries compared to those younger than 51.

Table 4 *Number of participants who read at least on some occasions and that are enrolled in public libraries, according to age*

		Not enrolled in libraries	Enrolled in libraries	
Age	18 to 50	139	178	$\chi^2=23.231, p=.000$
	51 and older	130	68	

Reading and digital media

We had a special interest in the prevalence of reading on digital media, and our results show that 70.7% of all the participants in the sample own a device that can be used for reading (smartphone, tablet, computer, e-reader), but over half of them (53.7%) never use those devices to read e-books. Such devices are most often used for reading web portals, blogs and magazines (54.7% read such content regularly or often) or daily newspapers (47.1% read such content regularly or often). Only 13% of participants read e-books regularly or often and one quarter of them (25.2%) read professional literature for work or school.

To look at how access to electronic devices is related to age, we again grouped the participants in two age groups, with the first one including all the participants younger than 51, and the second one includ-

ing all the participants aged 51 and older. The results (Table 5) suggest that the older participants don't own electronic devices as often as the younger ones do.

Table 5 *Number of participants who do or don't own an electronic device that can be used for reading texts, according to age*

		Own an electronic device that can be used for reading texts	Don't own an electronic device that can be used for reading texts	
Age	18 to 50	381	52	$\chi^2=143.230,$ $p=.000$
	51 and older	149	162	

Discussion

The first aim of this study was to find out how often Croatian citizens read. Our results show that only one third of population older than 18 reads on a more regular basis (at least once a month or more often), while another third reads at least on some occasions, which taken together shows that 69.2% of Croatian citizens can be described as at least occasional readers. Other research on reading habits and book sales for the same year shows that 47% of Croatian citizens report reading at least one book in the past year, and this percentage rises to 53% and 57% for 2017 and 2018, respectively (Book Market Research in Croatia, 2018). The differences in the results stem from differently formulated questions that were used to assess the participants' reading frequency. Nonetheless, the research shows that a large part of population in Croatia does not read on regular basis. Unfortunately, it is difficult to compare those data to data from other countries because researchers use different methods to assess reading habits, and many of the cross-national comparative studies did not include Croatia.

The frequent reader group was composed of participants who reported reading on a weekly basis or every day. The type of question we used to assess reading frequency didn't allow us to make distinctions regarding the type of books (fictional, factual, scholarly), the reason for reading (studying, leisure, information) or the media used for reading (print or digital). Our data show there are more women than men in this group, that one third of them are high-skilled, and that 39.7% are under 40 years of age. Previous research also shows that those who read more than average are more often female, younger than 24 years of age, and are high-skilled (Book Market Research in Croatia, 2018). The same research also showed that frequent readers most often come from Zagreb and coastal counties, which is very similar to the finding from this research, which shows that frequent readers most often come from the capital and the coastal counties (Split-Dalmatia County and Primorje-Gorski Kotar County).

Gender differences

Our results point to gender differences in reading habits of Croatian citizens. Not only do women read more often than men, but there are also more women in the frequent reader group and more women enrolled in public libraries. These findings are not surprising, since previous research also points to gender differences in reading habits (Robinson, Zill, & Winglee, 1990; Logan & Johnson, 2010). Explaining the exact reasons for this gap is beyond the scope of this article and gender differences in reading habits in adulthood are an extension of gender differences evident at an earlier age. Girls outperform boys in reading achievement, but girls also enjoy reading more than boys (Chuy & Nitulescu, 2014). Research shows that in explaining the gender gap in reading, biological (differences in cognition and self-motivation), cultural

(the influence of childhood socialization and gender stereotypes), as well as family factors (the time parents spend with boys and girls at preschool ages) are to be taken into account (Baker & Miligan, 2016; Matthews, Ponitz, & Morrison, 2009; Tepper, 2010).

Where they read

Another matter we wanted to investigate is where people like to read. Research shows that reading cannot be excluded from the physical environment (Kuzmičova, 2016) and one's home, as well as the practices performed in it, represent the opposite of public space (Cieraad, 1999). Most participants in our research like to read at home. This is not a surprising finding, since home is where they are most likely to find the time, as well as peace and quiet they need to focus on reading (Burgess, 1985).

Public libraries

It is important to highlight the distinction between how much we read, and how well we read. For example, research shows that in the UK, reading skills are improving, but the reading frequency is decreasing (Massey, Elliot & Johnson, 2005). Still, there is a connection between reading frequency and reading skills and an important factor to consider in this relation is access to books. It was the early large-scale assessment studies of reading literacy that showed that the selected school variables, such as class size and teaching practices, had a relatively small effect on reading achievement compared to the family background variables (Thorndike, 1973). In particular, the number of books in one's home was found to be one of the best predictors of reading literacy. Book access was later investigated not only in the family context, but also in the community, specifically through public libraries (McQuillan, 1998; Krashen, 2004, Krashen, Lee, & McQuillan, 2012), showing there is a strong positive relation between the library quality and reading achievement in school children. The rationale behind this relation is that when people have easy access to books, they have a greater probability to read more often and reading then affects their literacy development (Krashen, 2004). Furthermore, previous research shows that Croatian citizens most often read books they borrow from libraries, compared, for example, to books they buy or borrow from friends. It is for this reason that we wanted to investigate how many Croatian citizens are enrolled in public libraries and how often they take out books. There are 261 public libraries in Croatia (Public Library Portal, 2018). Yet, our data show that only half of the citizens who read at least on some occasions are enrolled in public libraries, and only 22.3% of them take out books regularly. Our data did not allow us to analyse other aspects of library use, which also might affect reading habits. Libraries are often valued for their potential to bring cultural empowerment to society, which leads to social, political and economic changes in the community (Awoyemi & Yusuf, 2016; Itsekor & Nwokeoma, 2017). Therefore, being enrolled in a public library might facilitate the development of reading habits in ways that go beyond just providing access to reading material.

Reading and digital media

Another important aspect of research on reading habits is the impact of digital media on those habits. Digital media affect reading in different ways. Researchers worry that digital media interfere with reading because they take away our time that would otherwise be spent reading, and this might be particularly dangerous when there are no strong reading habits developed. Contemporary decline in reading skills most critically endangers the most complex narratives, which are often most difficult to read from digital devices (Wolf & Barzillai, 2009). However, digital media might also encourage reading by offering one a chance to read certain content in electronic mode, which might make the reading material more accessible and also

make the reading process more mobile.

Our results show that almost two thirds (70.7%) of all the participants in the sample own a device that can be used for reading (smartphone, tablet, computer, e-reader), which is almost the exact percentage obtained in other research from the same year that points to the fact that 71% of Croatian citizens over 15 years old have an opportunity to read books on electronic devices (Book Market Research in Croatia, 2018), but that opportunity is rarely used. Our data show that only 13% of participants read e-books regularly or often. In comparison, other research from the same period shows that only 9% of those who have access to electronic devices use them at least sometimes to read e-books (Book Market Research in Croatia, 2018). In our research, the participants most often use digital devices to read web portals, blogs and magazines or daily newspapers, and other research supports such findings, showing that 72% of participants at least sometimes read daily newspapers in digital format (Book Market Research in Croatia, 2018).

Limitations of the study and guidelines for future research

The main limitation of the study is that since it was part of a larger survey on attitudes of Croatian citizens on social processes in Croatian society, it was not able to focus on reading habits in more detail. Therefore, we suggest further research that would include different methods of assessing reading frequency, and also gather information on the number of books owned or bought in a specific period, on different reading rituals, different reading materials, information regarding the language people read in, as well as the information on reading motivation and possible barriers. Research on motivation for reading and particularly on the conditions surrounding one's home reading practices is particularly important because we need more information on what drives people to choose to spend their leisure time reading or doing something else. Additionally, it would be important to study how reading rituals are related to different types of literature being selected (fiction/nonfiction). Another important aspect that might motivate people to engage in reading is their perception of individual reading benefits, which also needs further exploration.

In addition, we suggest a more detailed investigation of preference of paper vs. print media when it comes to reading, as well as an investigation of the types of content which participants read on a specific digital device they own and for what purposes (study, work, leisure).

Furthermore, the data presented in this paper come from a study conducted in 2016, so we might expect a slight change in the results over several years. Still, based on similar research (Book Market Research in Croatia, 2018), we don't expect such changes to be significant, and we find it is important to report that data in a scientific manner, for future reference.

Conclusion

The importance of reading for emotional, social and psychological benefits is often neglected in psychological research. Still, it is well documented. For example, in the study conducted by Billington (2015) on 4,164 adults in the UK, who were divided into two groups – readers and non or lapsed readers, the results showed that those who read for pleasure for 30 minutes or more a week reported a number of benefits when compared to the non-readers. Some of those benefits include less frequent feelings of stress and depression and stronger feelings of relaxation from reading than from watching television or using social media, but also higher levels of self-esteem and a greater ability to cope with difficult situations. Furthermore, reading helped them to feel less lonely and closer to their friends and their community. Finally, readers had greater understanding and empathy for others, as well as stronger and more engaged awareness of social issues and of cultural diversity (Billington, 2015).

Our results show that only one third of Croatian citizens older than 18 read on a more regular basis (at least once a month or more often), another third reads at least on some occasions, and almost one third never reads books. Most often they read at home, and although almost two thirds of them own an electronic device that can be used for reading, they rarely read electronic books. Only a third of participants are enrolled in public libraries, and less than a half of those participants often borrow books from libraries. Furthermore, our results show that women read more often than men, and are also more often enrolled in public libraries. Based on these results, we recommend interventions that should aim at providing effective reading support and target all groups of Croatian citizens, particularly men with lower-skilled education and those over 51. If we could raise the awareness of the psychological benefits of reading for just half an hour a week, and investigate in more detail the motivation for reading or the problems related to the absence of reading in Croatian citizens, we might provide the foundation for better psychological well-being of our citizens in the long run.

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7

Does Art Expression Help Mood Regulation?

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Abstract

Artistic creation can be used to give meaning to experiences or to express emotions thus providing some kind of relief and way to regulate emotions. In the context of using art as mood regulation and emotion expression, it is important to emphasize emotion regulation strategies such as distraction (shifting attention to artistic activities) and venting (expression of negative emotions). The aim of this study was to determine the effect of different art tasks on mood. Participants in this study (N=64) were distributed into four groups. All of them were exposed to negative mood induction, by watching the video clip. After that, positive and negative mood levels were measured. Subsequently, the first group produced artwork on what they experienced while watching the video (venting), the second group produced artwork on what makes them happy (positive distraction), the third group drew a stopwatch (neutral distraction) and the fourth group solved a labyrinth task (control). Participants' mood levels were measured again. Results have shown statistically significant mood improvement in the positive affect within the positive distraction group as opposed to the expressive and non-art i.e. control group. Significant mood improvement in the negative affect was detected within the neutral distraction group in comparison to the control group. Qualitative analysis of art works produced in positive distraction and venting group has shown content differences. All participants in the positive distraction group depicted concrete content, while there was an equal amount of abstract and concrete content types in the venting group artworks. Artworks in the venting groups were evaluated as more mature in developmental level, while artworks produced in positive distraction group were estimated as those with higher line quality and that participants took more effort and paper space for their realization. The results of this research confirm that art expression, in this case visual, affects the emotional state of the individual, which opens the possibility of its use in clinical, but also everyday purposes.

Keywords: art expression, mood, emotion regulation, distraction, expression

Introduction

For many years, characteristics of art and its influence on mankind are surprising and still remain somewhat obscure. Whether it is by color, shape, stone, verse or sound, it evokes different responses. From the basic bodily reactions such as heartbeat acceleration and deceleration or blood pressure change to deep emotional experiences. Experiencing art is complex and specific and it includes primary anthropological sensitivity for colors and shapes. This includes elementary aspects of the work, such as position and line character, psychological influence of color, contrast etc., but basic emotions such as fear, joy, anger and sadness as well (Pivac, 2013).

Since art expression includes touch, smell and other senses within the artistic experience, it represents a natural and sensory way of expression (Malchiodi, 2003). Drawing and other artistic endeavors activate the expression of sensory memories in a way that cannot be achieved by methods such as verbal interviews. Malchiodi (2001) suggests that emotional experiences, especially traumas, are encoded in our limbic system as a sensory reality so they should be worked through. Since those experiences can be expressed through art using a diversity of materials, it can be used as a powerful intervention for people that are dealing with different emotional difficulties. The most frequently used tasks are drawing sessions, where a person can draw an event that provoked a strong emotional response. These and similar techniques of art expression (e.g. clay modelling) have shown great success in reviving sensory memories and verbalizing unconscious or difficult emotional experiences while reducing their long-term effects (Steele, 1997).

Like in any field it is important to define key dependent variables, which in this case are emotions, affect and mood. Emotions are short and conscious experiences defined by an intense mental activity with a high degree of pleasure or discomfort (Cabanac, 2002; Reeve, 2010), while mood is described as less specific, less intensive with longer duration and often with no apparent cause (Scherer, 2000). Beck (2003) states that mood is part of a larger category represented by affect, and accordingly, the terminology of affect in this research is related to mood.

According to Larsen and Prizmic (2004), people on a daily basis, in a variety of ways, try to influence their mood or affective states, whether they want to maintain or change them, most often increasing the positive mood or lowering the negative. Gross (1999) proposed a process model of emotion regulation which presents two elementary ways of regulation where the first is antecedent-focused (regulation before the emotional response) and the second is response-focused (regulation after the emotional response). Antecedent-focused regulation includes situation selection, situation modification, attention redirection and cognitive change while the response-focused regulation includes reaction modulation such as changing behavioral responses and subjective perception (Gross, 1999; Gračanin, 2005).

In the context of using art in improving mood and expressing emotions, it is important to emphasize the process of redirecting attention because artistic expression is what attention can be redirected to. At the core of this process is the ability to redirect attention to the desired aspect of the situation so that it is possible to change the emotional response even after the situation has been selected and modified (Gross, 1999). Distraction regulation strategy has proved to be useful in dealing with very intense emotional stimuli (Sheppes, Scheibe, Suri & Gross, 2011) and in lowering negative affect in depressive patients (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008). Focus as a type of attention redirection can also be used in the context of artistic expression, e.g. making artwork (Gross, 1999).

Venting (emotion expression) is another strategy that is crucial for artistic expression. This is the strategy on which the idea that art can help with emotional pain or discomfort is based (Dalebroux, Goldstein & Winner, 2008). Researchers Lischetzke and Eid (2003) suggest that venting strategies such as artistic expression can help in improving mood by lowering negative affect after a period of time. However, it

should be noted that this strategy may not work well for short-term mood improvement since the person venting is dealing with those negative emotions throughout the whole process.

Distraction and venting have been tested in various art and mood related research experiments (Dalebroux et al., 2008; Pennebaker & Beall, 1986; Balkie & Wilhelm, 2005; Chan & Horneffer, 2006). De Petrillo and Winner (2005) tested the effects of artistic expression on short-term mood improvement. Those participants who drew expressively had a significant mood valence improvement. In a similar research by Dalebroux et al. (2008), subjects used venting and distraction to deal with negatively induced mood, while the control group searched for symbols. Those who were in the venting group produced work typically expressing sadness by drawing storms, withered plants etc., while those who were using positive distraction drew sun and flowers, as typical examples of expressing happiness. However, results did not show a short-term mood improvement. The tasks did not lower or intensify negative affect, but effect was detected in mood valence. The authors suggested that, in short term, artistic expression is most effective in lowering negative affect when positive artwork content is created (positive distraction strategy). Creating positive content allows a person to escape to a more pleasant imaginary situation (Dalebroux et al., 2008). Cognitive strategies such as reinterpretation or situation re-evaluation in terms of a positive situation outlook, lead to positive outcomes (Gross, 1999), while negative outcomes can often be related to rumination - focused attention on the symptoms of one's distress (Dalebroux et al., 2008). Lischetzke and Eid (2003) propose that as long as we are competent in emotion regulation, attention redirection can perhaps be the most successful strategy, while ruminating (focusing on emotions) can prolong negative mood effect.

As previously implied, the effect of visual artistic expression on emotional state is more than apparent. Using findings in psychology of emotional experience and combining emotion regulation strategies with artistic expression, the research has shown a wide range of results. A common link to most research findings is that artistic expression can regulate emotional state under certain conditions. It can be effective as a distraction in short-term mood improvement, but has long-term beneficial effects as a part of a psychotherapy process.

Finally, shifting the attention towards a product of the artistic expression can give us better insight into person's emotional status. Nevertheless, this can be challenging since interpretations of such products are burdened with subjectivism. When it comes to products of visual expression several scales for their estimation have been constructed. One of the most commonly used is *The Formal Elements Art Therapy Scale* (FEATS, Gantt and Tabone, 1998). Analysing technique (Taylor, 2004), motive depiction (Dalebroux et. al., 2008; Malchiodi, 2003) or color prominence (Gladding, 1997) of artworks in general, and when used as a therapy method, can be used in an attempt to explain mechanisms by which creating visual art may serve as mood modulator.

Guided by previous methodological designs and their shortcomings, this study will try to differentiate effects of expression task (focusing on perceived emotions through artistic expression), positive distraction (focusing on generally positive emotions through artistic expression), neutral distraction (drawing default cases) and the control task (solving labyrinths, the only task that does not include visual expression) to mood change. The use of these tasks enables the differentiation of the effects that different functions of visual expression (in terms of (non) emotional orientation) have on the mood. Furthermore, in this study qualitative approach is also used for the purpose of exploring the relationship between artistic aspects of works (such as abstractness / content concreteness, line quality, maturity...) and the mood they represent.

Material and method

Participants

Participants in this study were sixty-four students from the University of Zadar that were assigned into four groups (sixteen in each group; half of them were man and half women). Their age ranged from 18 to 29 years and the analysis showed no significant difference in age between participants in all four groups ($F(3,60)=0.47, p=.72$).

Instruments

A seven minute-long video clip was used to induce negative mood. The clip was a part of an HBO documentary film from 1996 called *Letting Go: A Hospice Journey* and it showed an eight-year-old boy Michael Merseal Jr. dying from a brain disease in his hospital bed.

As a measure of mood, *The Positive and Negative Affect Schedule (PANAS, Watson, Clark & Tellegen, 1988)* was used. PANAS measures positive and negative affect where participants have to estimate to what extent twenty adjectives describe their current emotional state on a scale of 1 (*Very slightly or not at all*) to 5 (*Extremely*). The scale consists of ten adjectives for each affect type such as *interested* or *excited* for positive affect and *nervous* or *ashamed* for negative affect. Scoring is done by summing up the ten adjective estimates for the positive affect (PA), and the other ten for the negative affect (NA). A larger sum of estimates on the scale of a certain affect signifies higher levels of a particular affect, and vice versa, a smaller sum of estimates on the scale of a particular affect indicates lower levels of a specific affect. PANAS, used frequently in affect research studies, showed good psychometric properties such as high reliability (PA $\alpha=.73-.89$, NA $\alpha=.71-.85$; Crawford & Henry, 2004) and good construct validity (Crawford & Henry, 2004; Schimmack, 2003). In this research PANAS was applied two times. For the first use (before drawing or solving the labyrinths) Cronbach α for PA was .77 and for NA was .83. For the second use (after drawing or solving labyrinths) reliability was also high. Cronbach α for PA was .80 and for NA was .86.

Participants were also supplied with A3-size drawing paper, graphite pencils, erasers, colored pencils, pastels, acrylic paints, brushes, colored papers for collage, scissors and paper glue.

Depending on the group, participants were assigned with art or non-art tasks. The first three groups worked on art tasks. The venting strategy group had to artistically express experienced negative emotions induced by the video, the positive distraction strategy group had to draw what makes them happy, while the neutral distraction strategy group had to draw a neutral object (stopwatch). The fourth (control) group of participants had to solve twelve labyrinths on paper that were generated on www.mazegenerator.net. We chose solving labyrinths to represent control situation for few reasons. The control task certainly should not include artistic expression (of any kind, not just visual). Furthermore, during the performance of this task, the subjects were not allowed to be emotionally engaged. It would be best if the respondents were not doing anything, i.e. they were relaxed, but then it would be impossible to control the flow of their thoughts (which could include an emotional component). Considering these reasons, the choice fell on labyrinth tasks. It was decided to use simple labyrinths to eliminate possible frustrations that could occur if they were solving complex examples, which could undermine the participant's mood. The time for task completion in all four groups was not limited.

To assess the elements of the produced artwork in venting and positive distraction group *The Assessment Scale of Artwork Elements (ASAE)* was constructed. The scale consists of eight subscales based on *The Formal Elements Art Therapy Scale (FEATS, Gantt & Tabone, 1998)*. The original FEATS scale consists of fourteen subscales. Since it is applicable to works of art, not just artworks within art therapy, the authors

of the original scale propose its modification with regard to researchers' needs. For the purposes of this research, six subscales were selected from the original FEATS scale:

- a) *Prominence of color* – use of color in the artwork
- b) *Implied energy* – degree of effort involved in the making of the artwork
- c) *Line quality* – overall line quality and control the artist exercised
- d) *Developmental level* – maturity of the artwork and the way motifs were depicted
- e) *Details of object and environment* – artwork complexity based on the task
- f) *Space* – how much paper space is used while producing the artwork

Modelled by research findings on artwork content and emotion expression in art therapy domain (Malchiodi, 2003; De Zan, 2013), two more subscales were added:

- g) *Abstract/Concrete* – whether the content has more abstract or concrete elements
- h) *Emotion expression* – estimate of how well the emotion was expressed based on the task

Each subscale had one item. In the case of the *Abstract/Concrete* subscale the evaluator had to decide whether the artwork content was more abstract (A) or concrete (C) and for *Prominence of colour* had to write what colour was predominantly used in the presented artwork.

For all other subscales estimations are done on 5 point scale. A higher value indicates a higher expression of certain properties. For *Space* each value on 5 point scale has a precise description (1 - less than 25%; 2 - between 25% and 49%; 3 - between 50 % and 74 %; 4 - between 75% and 99%; 5 - 100%).

For others only the extremes are described: *Implied energy* (1 - artwork was produced with the least amount of effort, 5 - artwork was produced with a great amount of effort), *Line quality* (1 - lines are broken, damaged, rough and hasty, 5 - lines are fluid, strong, continuous and controlled), *Developmental level* (1 - very infantile and immature, 5 - very mature and sophisticated), *Details of object and environment* (1 - the artwork is very simple with minimal details, 5 - the artwork is very complicated with a large number of details), *Emotion expression* (1 - the artwork does not seem to convey any expressed emotions and/or task completion, 5 - emotions are fully expressed based on the task that was given).

Procedure

The research was conducted in June, September and October 2017 in the laboratory for experimental psychology of the Department of Psychology at the University of Zadar. The participants were randomly assigned into four groups (venting, positive distraction, neutral distraction and control group). The first part of the procedure, inducing negative mood by watching the video, was the same for all participants. They were informed about the nature of the video prior to watching and had the liberty to withdraw at any given moment if the content of the video affected them too much. None of the participants has given up on participating in the research. The Ethics Committee of the Department of Psychology at the University of Zadar has approved the conducting of this research. After watching the video clip, PANAS was administered to measure mood levels. This was followed by performing one of the tasks, depending in which group they belonged to. At the end, respondents filled the PANAS scale for the second time.

In second part of study 58 evaluators, fifty-eight psychology students from the Department of psychology at the University of Zadar qualitatively evaluated artworks produced in venting and positive distraction group using ASAE.

Results

Mood changes as a function of art

The first step in the data analysis was to check whether the participants were balanced in mood levels before task intervention. Two one way ANOVAs were used, one for positive affect ($F(3,60)=0.55, p=.647$), and the other one for negative affect ($F(3,60)=0.45, p=.715$). Since participants were randomly assigned to different groups we expected no differences which these analysis confirmed.

As the dependent variable we used mood change which was operationalized as improvement in mood, to emphasize the same direction (decrease in negative and an increase in positive affect). Improvement in positive affect is calculated as 'the mood level after the intervention task' minus 'the mood level before the intervention task'. Conversely, improvement in negative affect is calculated with the opposite sign. This means lower mood later implies greater improvement. Descriptive statistics of these two dependent variables are shown in Table 1.

Table 1 Descriptive statistics for differences in positive affect (PA) and negative affect (NA) for every group

Group	Mood change	<i>M</i>	<i>SD</i>	Max D	Skewness	Kurtosis
Venting	diff PA	5.25	5.59	0.118	0.029 (0.564)	-0.815 (1.091)
	diff NA	8.13	7.33	0.239	1.440 (0.564)	2.119 (1.091)
Positive distraction	diff PA	11.44	5.49	0.166	0.241 (0.564)	0.650 (1.091)
	diff NA	9.13	5.89	0.138	0.555 (0.564)	1.172 (1.091)
Neutral distraction	diff PA	8.06	6.44	0.146	0.283 (0.564)	0.033 (1.091)
	diff NA	11.06	4.55	0.112	-0.032 (0.564)	0.011 (1.091)
Control	diff PA	4.31	6.13	0.149	1.628 (0.564)	3.794 (1.091)
	diff NA	5.25	4.28	0.138	0.321 (0,564)	-0.444 (1.091)

Note. diffPA – difference between positive affect before and after intervention
 diffNA – difference between negative affect before and after intervention
 - in brackets are given standard errors of skewness and kurtosis

The values of the above parameters suggest that the assumptions for using parametric tests have been satisfied (Kline, 2011).

To check whether intervention of any kind i.e. no matter of type of task, led to mood levels change t-tests for one sample were used (Table 2). Results showed that there was a significant change in the mood in all four groups so the next question is related to magnitude of that differences.

Table 2 Results of t-tests of mood change in the four groups

Group	Mood change	<i>t</i>	<i>df</i>	<i>p</i>
Venting	diff PA	3.76	15	.002
	diff NA	4.43	15	.000
Positive distraction	diff PA	8.33	15	.000
	diff NA	6.20	15	.000

Neutral distraction	diff PA	5.00	15	.000
	diff NA	9.72	15	.000
Control	diff PA	2.81	15	.013
	diff NA	4.90	15	.000

Note. diffPA – difference between positive affect before and after intervention;
diffNA – difference between negative affect before and after intervention

Therefore, two one-way ANOVAs were conducted on mood differences, one for positive ($F(3,60)=4.68, p=.005$) and the other one for negative mood ($F(3,60)=2.95, p=.040$), taking into account the group of participants. The analysis confirmed the group i.e. the tasks effects on mood change, positive and negative. When it comes to enhancement in positive affect, greater improvement has occurred in the positive distraction group in relation to the venting and control group (Table 3, Figure 1). For negative affect significant mood improvement was detected in the neutral distraction group compared to control group (Table 3, Figure 1).

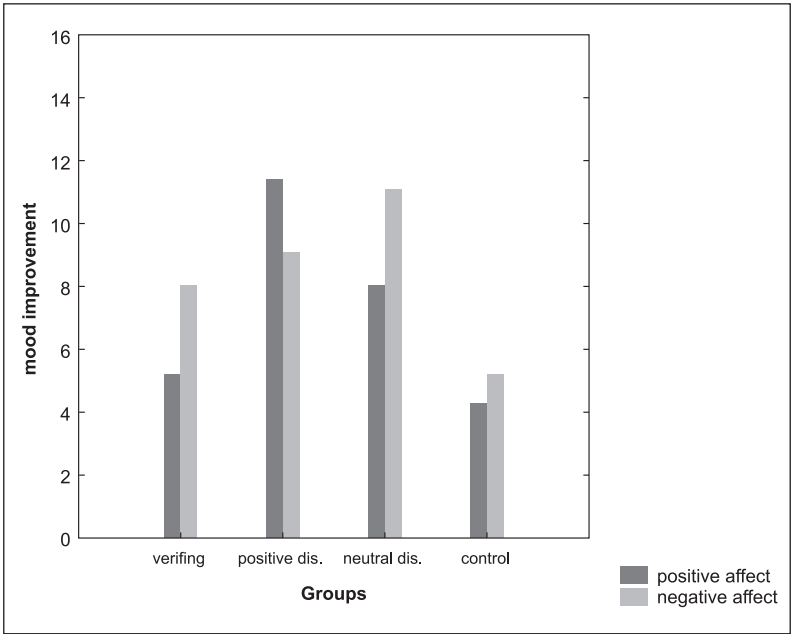


Figure 1 Mood change values in different groups

Table 3 Fisher LSD test of mood change in positive and negative affect

Group	Positive affect				Negative affect			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Venting (1)		.004	.185	.656		.618	.146	.155
Positive distraction (2)	.004		.112	.001	.618		.335	.057
Neutral distraction (3)	.185	.112		.079	.146	.335		.005
Control (4)	.656	.001	.079		.155	.057	.005	

Content analysis of the produced artwork

In the second part of the research a qualitative-quantitative analysis was conducted. There were fifty eight evaluators, psychology students from the Department of psychology at the University of Zadar. Thirty two visual products were rated, 16 from venting and 16 from positive distraction group. Products were rated on *The Assessment Scale of Artwork Elements*.

For six ASAE subscales, those which do not include nominal data, interrater agreements are calculated (Table 4).

Table 4 *Interrater reliability on ASAE subscales for produced artwork in venting and positive distraction group*

Subscale	Group	
	Venting	Positive distraction
Implied energy	.552	.546
Space	.809	.806
Line quality	.499	.451
Emotion expression	.307	.349
Developmental level	.406	.411
Complexity	.374	.391

There is a wide range in the degree of agreement, from poor (*Emotion expression and Complexity*) to excellent (*Space*). This is probably the consequence of the way each subscale is defined. *Space*, except the unambiguous definition (how much paper space is used while producing the artwork), has clearly defined description values on a scale from 1 to 5 (1 - less than 25%; 2 - between 25% and 49%; 3 - between 50% and 74%; 4 - between 75% and 99%; 5 - 100%). For scales that do not have so high reliability, this is not the case. It is quite possible that different evaluators imply different things when they are told to make estimates of how well the emotion was expressed.

For two subscales, *Abstract/Concrete* and *Prominence of colour*, which required nominal data, the authors made scoring on basis of the estimation of the majority of evaluators.

There is a significant difference between the frequencies of abstract and concrete content in two art task groups ($\chi^2=10,67$; $df=1$; $p=.0011$). All participants in the positive distraction group depicted concrete content, while there was an equal amount of both content types in the venting group artworks.

Dominant color frequencies are listed in Table 5.

Table 5 *Dominant colour frequency in the venting and positive distraction group*

Colour	Group	
	Venting	Positive distraction
Black	5	0
Red	4	1
Blue	2	3
Green	2	1

Yellow	1	3
Purple	0	1
Brown	0	2
Orange	0	1

Regarding color prominence, as seen in Table 5, the highest frequency of black was observed in the venting group, on five artworks, while no black was detected in the positive distraction group. Red was observed on four artworks in the venting group and on one in the positive distraction group while blue and green were equally prominent in the venting group. In the positive distraction group, yellow and blue were also observed on three artworks, and brown on two artworks. Purple, green and orange on one artwork each were observed, as well.

Furthermore, the differences in the results on the remaining subscales were also sought (Table 6) to explore the relationship between artistic aspects of the works and the mood they represent.

Since interrater reliability coefficients for two subscales (*Emotion expression* and *Complexity*) indicate unacceptable agreement among raters (<.40) they were excluded from this analysis. Subscale scores were averaged across estimations for artworks from two groups (16 in each group) to create one score for each subscale.

Table 6 *t*-test values obtained on ASAE subscale results – comparison of raters' (N=58) average scores

Subscale	venting		Positive distraction		<i>df</i>	<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Implied energy	3.10	0.45	3.30	0.53	57	-3.66	.000
Space	3.15	0.36	3.81	0.37	57	-20.32	.000
Line quality	2.97	0.47	3.12	0.56	57	-3.23	.002
Developmental level	3.07	0.52	2.91	0.66	57	3.09	.003

Raters evaluated that more effort, more paper space and higher line quality was within the artworks of the positive distraction group. Artworks in the venting groups were evaluated as more mature at the developmental level.

Discussion

Results obtained in this study contribute in many different ways to the idea of a relationship between emotional regulation and artistic expression, especially in terms of positive and negative affect. As mentioned before, participants were assigned to four groups. The first group expressed negative emotions in their artwork, the second one expressed positive emotions, the third group drew a stopwatch while the fourth group solved labyrinths. Participants who artistically expressed what happiness means to them (positive distraction group) experienced higher mood improvement in the positive affect than participants artistically expressing emotions experienced while watching the clip i.e. negative emotions. The results are consistent with previous research such as shown in Dalebroux et al. (2008) with his group of participants that expressed positive emotions in an artistic way. Similarly, Drake, Coleman and Winner (2011) discovered that using art expression as positive distraction is more effective in mood regulation than expressive writing.

Since venting is a type of art expression task that represents a strategy of coping with emotional distress, the results are also consistent with negative emotion expression strategies being non-effective in case of short-term mood improvement. Cognitive strategies such as reinterpretation/reappraisal are more beneficial if we see a distressing event in a more positive light (Gross & Thompson, 2006; Gross, 2002), at least short-term. Our attention is then shifted to more positive outcomes which leads to mitigating negative mood effects (Lischetzke & Eid, 2003).

The problem with venting and short-term mood improvement is timing. Although supported by clinical findings in the context of improving quality of life and emotional well-being, venting places negative emotions in the foreground which gives little space for sudden mood improvement, but is shown to influence positive outcomes in the long term (Bushman, 2002). This suggests that venting artistically would be least effective in lowering negative affect in short-term experiments like this one. However, no differences were detected in negative affect levels between the positive distraction, neutral distraction or venting group. What is then an appropriate technique to improve mood in the context of negative affect? People process positive and negative emotions differently while the latter demand a more immediate response. Negative emotions, such as fear, encouraged greater attention and caution of the individual in the ruthless environment of our early ancestors while positive emotions signaled safety and optimum state to be achieved (Hasselton & Ketelaar, 2005). Perhaps it takes more time and intensity to deal with such emotions, and their effect cannot be eliminated in a short time, either by visual expression or some other kind of distraction.

Solving labyrinths represents the only non-artistic task used in this research so it is interesting to compare mood differences evoked by this task and other, artistic tasks. For positive affect this task led to smaller mood improvement when compared to positive distraction task, while there was no difference when compared to neutral distraction and venting. Superiority of positive distraction have already been explained. Improvement in negative affect was better after neutral distraction task, while control task of labyrinth solving was equally efficient as negative and positive distraction. Neutral distraction task has one crucial similarity with labyrinth solving. While performing them, the participants are not focused on emotions. So the “only” difference between neutral distraction and control task is related to activity that is performed; drawing vs. passing through labyrinth. Nevertheless, drawing was more efficient in distracting from negative emotions than labyrinth solving. We put the word “only” in question marks because it is of course possible that there are some other differences, beside activity that is performed (for example in workload), which are not controlled. Some future research may give us a better insight in these relations.

The qualitative analysis showed that the artworks from two groups in which the subjects were focused on emotions, positive distraction and venting, differed in terms of abstractness. All participants in the positive distraction group depicted concrete content, while there was an equal amount of both content types in the venting groups’ artworks. Explanation for displaying abstractions in expressive group can be found in instruction and nature of the task. Participants had to focus on what they experienced during watching a video clip. As the culmination of the video clip is the boy’s death, they were most often focused on that. Participants generally took the perspective of the boy or the parents and created content related to death and sorrow in general, which is hard to express in concrete content. When it comes to the positive distraction group, the artworks were a representation of happiness. Perception of happiness is subjective and different for each individual, but mostly directed towards a goal whether it is family, success, health etc. (Tadić, 2009). One of the participants depicted happiness as *going to a larger city where he would have more opportunities* (Figure 2). All of these are concrete aspects of life so concrete artwork content is not surprising.

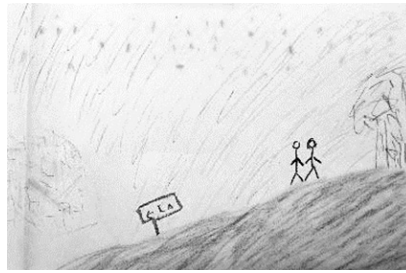


Figure 2 Concrete artwork content from the positive distraction group

Regarding colour use, black was most frequently used in the venting group ($f=5$). Black is generally a colour that culturally represents negative emotions, depression and sadness which aligns with the venting group task. Furthermore, blue was present in only two artworks from this group. Blue often represents sadness and melancholy in art therapy and in art in general, so the lack of it was surprising. However, the role of language should be mentioned. The English language has a specific idiom - feeling *blue* - which is used when someone is describing negative mood in terms of sadness. This could suggest that English speakers will use blue more frequently in depiction of sadness and depressive states as it was shown in the art therapy research on English speaking participants (Malchiodi, 2003). In the Croatian language, people are more inclined to use an idiom – *sve mi je crno* (literal translation: *everything is black*) when describing such emotion. This language specificity and how it effects mood perception is in accordance with Sapir-Whorf hypothesis of language which states that language affects thinking, emphasizing the important cultural aspect of language (Ciaccio & Bormann, 2013). In positive distraction group yellow was more prominent.

Level of implied energy, or the perception of the effort involved in the artwork, was perceived higher for works produced in the positive distraction group. It could be that the abstract content in the venting group was perceived less complex and hence easier to produce. This is compatible with the perception that abstract art is physically less demanding to produce, thus eliminating the importance of the inventiveness of the idea (Hackett, 2016).

More paper space was used in the positive distraction group which was also the result of the lack of abstract content in it. Perceived abstract content (lines and shapes) usually did not fill the whole paper, while the concrete content depicted elaborate scenes and stories which covered most of the space.

Gladding (1997) suggests that a lot can be learnt from aspects of how the lines on paper are drawn, such as some mood aspects. In regards to that, lines can vary in length, thickness and shape. Dotted and rough lines often symbolize anger and restlessness while fluid and continuous lines symbolize calmness and stability. Lower line quality found in venting group corresponds to the nature of the task and also the art therapy practice, where the negative and disturbing contents of someone's trauma reflect on the form of the lines they produce.

Higher developmental level in artworks was perceived in the venting group. This interesting finding may have been the result of the use of collage technique in the venting group considering the quality and creativity of both works. In addition, higher frequency of concrete content in the positive distraction group suggests that more participants drew concrete objects such as nature, people and animals what could be perceived more childish.

Given that there is still a lack of research on such topics, it is worth to highlight some shortcomings and recommendations for future research to improve their quality and encourage new researchers in this area. Primarily, the problem is certainly sample size. The participants were assigned into four groups, sixteen in each. It is suggested to use a larger sample in future research. Trends in mood changes are noticeable in the data obtained, but lower statistical power probably contributed to their insignificance. By increasing the sample size, this problem would be alleviated, and the statistical power increased, eventually confirming

or eliminating possible doubts. Furthermore, as time for task solving was unlimited, the participants spent a different period of time working. Considering that there were several people who artistically expressed up to thirty minutes, a reference to future research would suggest a precise measure of work time to test the intensity of mood changes based on the time spent working.

Finally, the artwork evaluation process should also include experienced art therapists and a more accurate scale of assessment that would cover all aspects that are not covered by this arbitrary scale. This applies in particular to the description of the values on 5 point scale. In an arbitrarily constructed scale in this research, only the extremes of the estimation value is described (except in the case of *Space* subscale which was defined by percentages) because the original scale is used in a clinical environment as a type of a projective test so the descriptions are adapting to the tests like FSA (*Face Stimulus Assessment*) (Gantt, 2015). For future research on a non-clinical sample, more detailed descriptions are proposed.

Conclusions

Several general conclusions can be drawn which can be the basis for future research and contribute to a better understanding of visual expression as a mood regulation method. The results suggest that visual expression is an effective way to improve mood instantaneously, especially as a distraction task, while the effectiveness of a venting task is questionable.

In addition to the importance of the process of visual expression itself, attention must also be paid to the product. Produced artwork content can provide a great deal of information about ways to deal with emotions, regardless of their valence. Colors, lines, and shapes may point to certain stereotypical aspects of the artistic process that could be generalized but retaining the individual's effort to present their unique inner state. All of this opens up new issues and problems that may be an incentive for further research.

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8

Testing the Fisher's Temperament Model on a Croatian Sample

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Abstract

According to Helen Fisher's theory of temperament, which is founded on a biological basis, there are four dimensions of temperament: Curious/Energetic, Cautious/Social-Norm Compliant, Analytical/Tough-Minded, and Prosocial/Empathetic. The aim of this research was to test the relationship of these dimensions of temperament to some socio-demographic characteristics and relationship characteristics in a sample of young adult subjects. The sample consisted of 846 participants who were in the age range from 18 to 40 years. Participants filled out online Fisher's Temperament Inventory and sociodemographic data were collected.

The results showed that men were more Analytical/Tough-Minded in comparison to women, whilst women were more Prosocial/Empathetic in comparison to men. Members of a particular religion, in relation to those who were not religious, were more Cautious/Social Norm Compliant. The better educated individuals did not differ from the less educated regarding the temperament dimension Curious/Energetic. As expected, more conservative participants were more Cautious/Social Norm Compliant and less Prosocial/Empathetic than the more liberal. Individuals who had a stronger opinion about sex as an essential part of a successful relationship, were more Curious/Energetic and Analytical/Tough-Minded and less Cautious/Social Norm Compliant compared to those who had a less expressive opinion about that. These results are in line with the initial hypotheses and further evaluation of the Fisher's temperament model is needed.

Keywords: temperament, Curious/Energetic, Cautious/Social Norm Compliant, Analytical/Tough-Minded, Prosocial/Empathetic

Introduction

Temperament traits are defined as the fundamental dispositions which appear early in the development in the domains of self-regulation, activity, affectivity and attention. They are the products of the complex interaction between genetic, biological and environmental factors, which act over time (Shiner et al. 2012). Quite a large number of temperament dimensions are inherited and remain stable throughout life. They are also linked to specific genetic paths, neurotransmitter systems and hormones (Fisher, Rich, Island, Marchalick and Silver, 2010b). There are many different theories and temperament models, but the focus of this research is the new model proposed by Helen Fisher. The author differentiates four broad dimensions of temperament, to which she adds characteristic traits and forms of behaviour, which stem from their biological basis. Specifically, the presumed biological bases of the fundamental dimension *Curious/Energetic* are the neurotransmitters dopamine and norepinephrine. On the basis of previous research into the links between dopamine and individual personality traits and patterns of behaviour, Fisher describes the *Curious/Energetic* temperament type. Earlier research, which is her starting point, shows that people with high levels of dopamine are prone to sensation seeking and novelty seeking (Zuckerman and Kuhlman, 2000). They are more likely to participate in risky activities such as smoking, gambling, or abuse of drugs or alcohol (Zuckerman, 2005). Higher levels of dopamine were also positively linked with curiosity (Braun Marvin, 2015), creative performance (de Manzano, Cervenka, Karabanov, Farde and Ullen, 2010), sexual drive (Melis and Argiolas, 1995) and impulsiveness (Dalley and Roiser, 2012). For the second dimension of temperament, *Cautious/Social Norm Compliant*, the presumed biological basis is the neurotransmitter serotonin. The personality traits that Fisher ascribes to people who express this dimension are based on previous research into their connection with serotonin. These are: numerical and visual creativity (Reuter, Roth, Holve and Hennig, 2006), lower levels of anxiety, greater sociability (Golimbet, Alfimova and Mityushina, 2004), better self-control (Bizot, Le Bihan, Puech, Hamon and Thiébot, 1999) and self-transcendence, that is, the personality trait from Cloninger's model which is linked with some aspects of religious behaviour (Lorenzi et al., 2005). Research has also confirmed the important role of serotonin in socially cooperative behaviour (Wood, Rilling, Sanfey, Bhagwagar and Rogers, 2006), and lower levels of its activity are linked with aggressiveness (Davidge et al., 2004). Fisher (2009) presumed that a *Cautious/Social Norm Compliant* person would be the least sexual of the four temperament types. The author bases this presumption on the results of research according to which higher levels of serotonin lead to a reduction in sexual desire and sexual function (Rosen, Lane and Menza, 1999). The presumed biological basis of the third dimension, *Analytical/Tough-Minded*, is the hormone testosterone. The traits and forms of behaviour which Fisher links to this dimension are based on earlier research, which reports on their connection with testosterone levels. Prenatal levels of testosterone were shown to be significant predictors of results achieved in cognitive tests examining focus on details (Auyeung et al., 2012). Prenatal testosterone is also negatively linked with empathy (Chapman et al., 2006) and the frequency of making eye contact (Lutchmaya, Baron-Cohen and Raggatt, 2002). Testosterone was shown to worsen verbal fluency (Wolf et al., 2000) and lead to a reduction in the use of words in social interactions (Pennebaker, Groom, Loew and Dabbs, 2004). Its positive connection was confirmed with social domination, and a negative correlation was found with socio-emotional engagement (Farrant, Mattes, Keelan, Hickey and Whitehouse, 2012). In terms of sexual motivation, higher levels of testosterone are linked to greater sexual desire (Meston and Frohlich, 2000). Finally, for the fourth and final dimension, *Prosocial/Empathetic*, the presumed biological bases are the hormones oestrogen and oxytocin. For oestrogen it was shown that it improves verbal working memory (Rosenberg and Park, 2002) and verbal fluency (Miller, Conney, Rasgon, Fairbanks and Small, 2002). It was confirmed for women that they are more emotionally expressive (Kring and Gordon, 1998) and that they remember emotions better (Canli, Desmond, Zhao and Gabrieli, 2002). The level of oestrogen is positively correlated with agreeable-

ness (Treleaven, Jackowich, Roberts, Wassersug and Johnson, 2013). On the basis of this research, Fisher et al. (2015) presume that *Prosocial/Empathetic* individuals have stronger mental flexibility and contextual thinking. Alongside oestrogen (Derntl, Hack, Kryspin-Exner and Habel, 2013), studies also report a positive correlation between oxytocin (Barraza and Zak, 2009; Shamay-Tsoory et al., 2013) and empathy. This hormone is also linked to social affiliation (Feldman, 2012) and altruism (Israel, Weisel, Ebstein and Bornstein, 2012), and it is also connected to trust, probably motivating cooperation (Zak, Kurzban and Matzner, 2004).

Since, as far as we know, only the author Fisher and her associates have dealt with empirical verification of the temperament model described, the aim of this research was to assess the relationship of the above mentioned temperament dimensions to some socio-demographic traits and relationship traits in a sample of young adult subjects. Based on previous research, it was to be expected that men would be more *Analytical/Tough-Minded* in comparison with women, and that women would be more *Prosocial/Empathetic* in comparison with men. It was also expected that members of a specific religious group would be more *Cautious/Social Norm Compliant* than individuals who are not religious. Better educated individuals should be more *Curious/Energetic* than those who are less educated. In terms of political orientation, it was presumed that more conservative individuals would be more *Cautious/Social Norm Compliant* than liberals, and less *Prosocial/Empathetic*. It is also to be expected that individuals with more strongly expressed feelings about sex as an essential part of a successful relationship would be more *Curious/Energetic* and more *Analytical/Tough-Minded*, and less *Cautious/Social Norm Compliant* than those individuals who have a less strongly expressed opinion about that subject.

Method and material

Participants

The convenience sample comprised a total of 864 participants (for details see Lucić, 2018). In this paper the results are shown for a total of 846 young adult participants (323 men and 523 women), aged from 18 to 40 years ($M=23.49$; $SD=3.82$). In relation to sexual orientation, people of heterosexual orientation dominated the sample ($N=820$), whilst 26 participants were of bisexual orientation. In relation to the level of education, most participants ($N=429$) had high school education. The largest number of participants ($N=429$) were also politically liberally oriented, and in terms of religion, members of a specific religious group were dominant in the sample ($N=560$) (Catholic, Orthodox, Protestant, Muslim, or other).

Measuring instruments

The Fisher Temperament Inventory

The Fisher Temperament Inventory, by Fisher et al. (2010a), measures four dimensions of temperament, as follows: *Curious/Energetic*, *Cautious/Social Norm Compliant*, *Analytical/Tough-Minded*, and *Prosocial/Empathetic*. The inventory consists of a total of 56 items. For each of these dimensions there are 14 items, to which answers are given on 4-degree scales (from *strongly disagree* to *strongly agree*). The *Curious/Energetic* scale comprises items such as: “*I am more enthusiastic than most people*” and “*I find unpredictable situations exhilarating*”. The *Cautious/Social Norm Compliant* scale consists of the following items: “*In general, I think it is important to follow the rules*” and “*My family and friends would say I have traditional values*”. The *Analytical/Tough-Minded* scale contains items such as: “*I am more analytical and logical than most people*” and “*I am tough-minded*”. Finally, the *Prosocial/Empathetic* scale includes: “*I am very sensitive*”

to people's feelings and needs" and "I have a vivid imagination".

Permission to use the Fisher Temperament Inventory was given by the author herself. The inventory was translated from English into Croatian language and then back from Croatian to English in order to identify possible discrepancies. Equivalence English and Croatian version was obtained by the authors of this study and an English language expert.

For more details about four-factor structure of the Croatian version Fisher Temperament Inventory see Lucić (2018). In the research, satisfactory values were also obtained for the Cronbach-alpha reliability coefficients, which were: 0.80 (the scale Curious/Energetic), 0.79 (the scale Cautious/Social Norm Compliant), 0.78 (the scale Analytical/Tough-minded) and 0.87 (the scale Prosocial/Empathetic).

Socio-demographic Data

For the purpose of the research a questionnaire was designed to collect socio-demographic data. The questionnaire consisted of 15 multiple-choice questions, or with filling in blanks, related to the gender, age, sexual orientation, level of education, occupation, political orientation and religiosity of participants.

In order to determine the education level, next categories were offered: high school, undergraduate university level, graduate university level, postgraduate level and *"other"*.

Furthermore, for determination of political orientation, five categories were offered, defined as: *very liberal*, *liberal*, *conservative* and *very conservative*, and a category defined as *"other"*. The subjects had to select the category that related to their political orientation. Religious (non)affiliation was defined by the following categories: belonging to a specific religion (Catholic, Orthodox, Islam, Protestant, or some other religion), Atheism, Agnosticism, Spirituality and Non-Religiosity, and Non-Religiosity. The subjects were also required to determine on a scale of one to four (in a range from *"I disagree entirely"* to *"I agree completely"*) to what extent they agree with the statement that sex is an essential part of a successful relationship.

The questions described here relating to political orientation, religious affiliation and to the importance of sex were defined in the same or a similar manner as in previous research by Fisher et al. (2015).

The Procedure

The research was conducted during the months of May and June 2017. The questionnaires took about 10 minutes to complete. A link leading to the online questionnaire was given through the Facebook social network and posted in various Facebook groups, and also using personal messages. As some participants expressed their will to further distribute questionnaire, e-mail was also used (snowball method). The anonymity was emphasized to potential participants in the research, as well as the fact that the data obtained would be used exclusively for scientific purposes.

Results

The results for all variables were first standardized and extremes were removed, that is, z-scores larger than 3.29 (Field, 2009), and their values were replaced by average values (23 cases i.e. less than 3%).

Descriptive parameters for dimensions of temperament are presented in Table 1. The normality of distributions were tested using Kline's criteria (2011), which includes calculation of the skewness index (SI) and the kurtosis index (KI). An SI value less than 3.00 and KI less than 8.00 meet Kline's criteria (2011), and enable the use of parametric statistical analysis.

Table 1 Descriptive parameters for dimensions of temperament

Dimension	<i>M</i>	<i>SD</i>	<i>SI</i>	<i>KI</i>
Curious/Energetic	24.85	5.43	0.36	0.42
Cautious/Social Norm Compliant	26.11	5.06	0.21	0.38
Analytical/Tough-Minded	25.40	5.25	0.30	0.54
Prosocial/Empathetic	26.20	6.96	-0.16	0.06

M-mean; *SD*- standard deviation; *SI*- skewness index; *KI*- kurtosis index

T-tests and one-way analyses of variance were performed. Before these analyses, Levene's tests were used to test the equality of variances. In case of unequal variances, Welch's analysis of variance was used. More specifically, it was used in the case of testing difference in the dimension of *Analytical/Tough-Minded* with regard to opinion about sex as an essential part of successful relationship.

Testing difference in the dimension *Analytical/Tough-Minded* between men ($n=323$) and women ($n=523$) has shown a significant difference ($t=-7.77, p=0.00$). As expected, men were more *Analytical/Tough-Minded* ($M=24.13, SD=5.14$) in comparison to women ($M=24.34, SD=5.03$). With regard to the dimension *Prosocial/Empathetic*, a significant difference is also found ($t=10.96, p=0.00$). In line with our expectations, women were more *Prosocial/Empathetic* ($M=28.12, SD=6.76$) in comparison to men ($M=23.08, SD=6.10$). For both dimensions of temperament the d value ($d=0.55$ for *Analytical/Tough-Minded* and $d=0.78$ for *Prosocial/Empathetic*) may be interpreted as the medium effect size (Kolesarić, 2006). Additionally, gender differences in other two dimensions of temperament (*Curious/Energetic* and *Cautious/Social Norm Compliant*) were also tested by t-tests and significant differences were not found ($p>0.05$).

In further analysis, a t-test was conducted to check if the members of a specific religion were more *Cautious/Social Norm Compliant* than those who are not. The group of "religious" participants ($n=560$) included those who indicated that they were members of a specific religion. Those participants who stated that they were atheists, agnostics, spiritual but not religious and the non-religious were in the "non-religious" group ($n=286$). In line with our expectations, religious participants had significantly higher results in the dimension *Cautious/Social Norm Compliant* ($M=26.90, SD=5.38$) than the non-religious ($M=23.88, SD=5.44; t=3.51, p=0.00$). According to Kolesarić (2006) the d value ($d=0.56$) may be interpreted as the medium effect size.

Further analysis included testing the difference in the dimension *Curious/Energetic* in relation to the level of education. Difference was tested between two groups, ie. the participants with high school education ($n=429$) and the participants with university education ($n=409$). This last group consisted of participants with undergraduate, graduate and postgraduate level. Participants with elementary school ($n=8$) did not include in this analysis. The difference in the dimension *Curious/Energetic* did not find between participants with high school and university level ($F=0.45, df=1, p=0.50, \eta^2=0.00$).

The following analysis verified the hypothesis about the differences between very liberal, liberal, conservative and very conservative participants in relation to the dimensions *Cautious/Social Norm Compliant* and *Prosocial/Empathetic*. A significant difference in the dimension *Cautious/Social Norm Compliant* was found ($F=20.43, df=3, p=0.00; \eta^2=0.08$). Fisher's LSD post-hoc testing confirmed significant differences between the following groups: very liberal ($M=24.81, SD=4.90$) and conservative ($28.12, SD=5.52$); very liberal ($M=24.81, SD=4.90$) and very conservative ($30.30, SD=7.11$); liberal ($M=25.42, SD=5.11$) and conservative ($28.12, SD=5.52$); and liberal ($M=25.42, SD=5.11$) and very conservative ($30.30, SD=7.11$) political orientation. In all these cases, the differences are significant at the level of 5% or lower. According to our presumption, participants with a more conservative orientation were more *Cautious/Social Norm*

Compliant.

Regarding the dimension *Prosocial/Empathetic*, there was also a statistically significant difference according to political orientation ($F=3.16$, $df=3$, $p=0.02$, $\eta^2=0.01$). Fisher's LSD post-hoc testing confirmed significant differences ($p<0.05$) between the following groups: very liberal ($M=27.51$, $SD=7.48$) and very conservative ($M=22.60$, $SD=8.67$); liberal ($M=26.42$, $SD=6.54$) and very conservative ($M=22.60$, $SD=8.67$); and conservative ($M=26.01$, $SD=7.36$) and very conservative ($M=22.60$, $SD=8.67$) political orientation. In all cases, the participants with more liberal political orientation were more *Prosocial/Empathetic*.

Further analyses related to testing the significance of differences in the dimensions *Curious/Energetic*, *Analytical/Tough-Minded* and *Cautious/Social Norm Compliant* between the four groups of participants who differed in their opinion about the importance of sex as a essential part of a successful relationship (completely disagree ($n=47$), disagree ($n=93$), agree ($n=386$) and completely agree ($n=320$)). Significant differences were obtained for all three these dimensions. For *Curious/Energetic* dimension significant difference is confirmed by analysis of variance ($F=9.39$, $df=3$, $p=0.00$, $\eta^2=0.03$). Post-hoc testing (Fisher's test) found significant differences ($p<0.05$) between the groups of participants who did not agree ($M=23.51$, $SD=5.21$) and who agreed completely ($M=26.05$, $SD=5.87$), as well as those who agreed ($M=24.17$, $SD=5.18$) and those who completely agreed ($M=26.05$, $SD=5.87$) with the opinion that sex is an important part of a successful relationship. The participants who agreed completely with this opinion were more *Curious/Energetic*.

Similar results are obtained for the dimension of *Analytical/Tough-minded*. Welch's analysis of variance also confirmed significant difference (Welch's $F=5.64$, $df=3$, $p=0.00$, $\eta^2=0.03$). Fisher's test showed significant differences ($p<0.05$) between groups of subjects who did not agree ($M=24.96$, $SD=5.21$) and who agreed completely ($M=26.37$, $SD=5.93$), as well as those who agreed ($M=24.73$, $SD=4.72$) and those who completely agreed ($M=26.37$, $SD=5.93$) with the opinion that sex is an important part of a successful relationship. The participants who agreed completely with this opinion were more *Analytical/Tough-Minded*.

Regarding the dimension *Cautious/Social Norm Compliant*, significant differences were also determined by analysis of variance ($F=3.94$, $df=3$, $p=0.01$, $\eta^2=0.01$) and post-hoc testing ($p<0.05$) between participants who did not agree completely ($M=28.13$, $SD=6.26$) and those who agree ($M=26.15$, $SD=4.87$) and those who agreed completely ($M=25.61$, $SD=5.88$) with the opinion that sex is an important part of a successful relationship. There is also a significant difference between the group who did not agree completely ($M=28.13$, $SD=6.26$) and the group who completely agreed ($M=25.61$, $SD=5.88$) with this opinion ($p<0.01$). These results showed that participants who agreed less with the opinion that sex as an essential part of a successful relationship were more *Cautious/Social Norm Compliant*.

Discussion

Based to the study of authors Fisher et al. (2015), in this research, the differences in some dimensions of temperament were examined. More precisely, differences in relation to the gender, religiosity, education levels and political orientation of the participants, and their opinion about the importance of sex as an essential part of a successful relationship. In line with the initial presumption, it was established that men are more *Analytical/Tough-Minded* than women, whilst women are more *Prosocial/Empathetic* than men. The results are in line with the research by Fisher et al. (2015). These differences the authors interpreted as indirect proof that the *Analytical/Tough-minded* scale measures some of the effect of the testosterone system, whilst the *Prosocial/Empathetic* scale relates to the effect of the oestrogen and oxytocin systems. Investigating neural correlates of Fisher's temperament dimensions, a brain-imaging study (Brown,

Acevedo and Fisher, 2013) also showed a significant relation between the results attained on the *Analytical/Tough-Minded* scale and neural activity in the parietal and occipital areas of the cortex. These areas are involved in spatial/mathematical thinking and basic visual functions. Those areas are also sexually dimorphic areas of the cortex. According to the authors, the positive relation between *Analytical/Tough-Minded* and neural activity in the occipital cortex is one more proof that this scale reflects aspects of behaviour which are related to testosterone. In terms of the dimension *Prosocial/Empathetic*, the results on this scale were significantly correlated with neural activity in the following areas of the cortex: anterior insula, inferior frontal gyrus and fusiform gyrus (Brown et al. 2013). These areas are rich in mirror neurons, which have been linked to empathy (Lamm, Batson and Decety, 2007), and the function of the oestrogen and oxytocin system is also linked to empathy (Brown et al. 2013). Although Fisher et al. (2015) connected gender differences in these two dimensions of temperament indirectly with biological differences in the functioning of hormonal and neural systems of men and women, the influence of various socialization processes could not be ruled out. Fisher's temperament model did not assume gender differences in other two dimensions of temperament. Additional analyses in this research did not show differences in *Curious/Energetic* and *Cautious/Social Norm Compliant* dimensions.

Furthermore, the results confirmed the hypothesis, according to which the participants who identified themselves as members of a specific religion achieved significantly higher results on the *Cautious/Social Norm Compliant* scale than those who are not. The results are in line with the research by Fisher et al. (2015), as by Borg et al. (2003) about the positive relationship between serotonin receptors and self-transcendence, which is one of the dimension of Cloninger's model of personality, and which is also linked to religious behaviour, subjective experience and a personal view of the world. The study by Lorenzo et al. (2005) confirms the influence of the serotonin system on this dimension of personality.

Regarding educational status, the results of the research carried out did not show any significant difference in the dimension of temperament *Curious/Energetic* between participants with different levels of education. This result may be explained by the structure of the sample itself. That is to say, the level of education of most of the participants was high school education.

The results related to political orientation turned out as expected. The more conservative participants were more *Cautious/Social Norm Compliant* and less *Prosocial/Empathetic* than the liberal ones. In the research by Graham, Haidt and Nosek (2009), more conservative individuals than the more liberal ones achieved higher results on the scales measuring respect of authority and tradition, which are traits linked with the dimension *Cautious/Social Norm Compliant* (Fisher et al. 2015). The more liberal participants, however, in comparison with the more conservative ones, had higher results on the scales measuring care and concern, which are characteristics linked to oestrogen (Smith et al, 2012) and oxytocin (Feldman, 2012). However, alongside biological factors, political orientation is also affected by a variety environmental factors such as the neighbourhood, family, religious affiliation and work experience (Marcus et al, 1995, according to Alford, Funk and Hibbing, 2005). In order to determine political orientation in this research, one item was used, as in the research by Fisher (2015). It may be assumed that there would be somewhat different results if more complex questions were used to measure political conservatism and/or liberalism.

Finally, in terms of the relationship traits relating to the opinion of the participants about the importance of sex as an essential part of a successful relationship, the expected results were obtained. The participants who had a stronger opinion about this, in comparison to those who had a less strongly expressed opinion, were more *Curious/Energetic* and *Analytical/Tough-Minded* and less *Cautious/Social Norm Compliant*. The results were in line with the results reported by Fisher et al. (2015). In the interpretation of the results, the authors emphasize the biological factors and earlier research on the basis of which the initial hypotheses were set. So, increased activation of the dopamine system, which is the bio-

logical basis of dimension *Curious/Energetic*, was shown to be positively correlated with increased sexual drive (Melis and Argiolas, 1995). The fact that dopamine can stimulate sexual desire has been also shown in animals and humans (Pfaus, 2009). Regarding the dimension *Analytical/Tough-minded*, Fisher et al. (2015) suppose that testosterone, which is the biological basis of this dimension, increases sexual desire (Meston and Frohlich, 2000; Simon et al. 2005). According to the Fisher's et al. (2015) hypothesis for the *Cautious/Social Norm Compliant* dimension, whose biological basis is serotonin, it was presumed that sex would be deemed to be a less important part of a successful relationship. Earlier research has also shown that higher levels of serotonin lead to a decrease in sexual desire and function (Rosen, Lane and Menza, 1999). Our research did not include measures of sexual desire and/or function in participants with different opinion about sex as an essential part of successful relationship, so the interpretations of results on the basis of earlier studies about relation between various hormones and/or neurotransmitters and sexual desire are not completely possible. According to the results of this study that participants with a less strongly expressed opinion about sex as an important part of a successful relationship were more *Cautious/Social Norm Compliant* could be explained by their religiousness and conservative political orientation.

In the undertaken research, the Fisher Temperament Inventory was used for the first time on a Croatian sample. The author herself (Fisher et al. 2015) emphasized its advantages as a supplement to five-factor personality questionnaires and/or use within a broader context, which in the end may contribute to insights in the field of personality. Although more recent, Fisher's Inventory is used in practice, in couples' therapy, staff training, when finding foster parents for children, and on a well-known internet site for finding life partners (Fisher et al. 2015). Its advantages should certainly be emphasized. That is to say, the inventory is constructed on the basis of brain architecture and physiology. Because of that, it may contribute to explaining the key aspects of temperament (Fisher et al. 2015).

According to η^2 and d values, the small and medium effect sizes in this research should also be mentioned, as and in the research by Fisher et al. (2015). It should also be emphasized that the temperament dimensions proposed by Fisher's model do not represent a complete representation of the four biological systems which function completely independently of each other. That is to say, they act in interaction with one another. They also interact with other biological systems and other environmental influences, and all together in the end may contribute to individual differences in temperament. In general, Fisher's model has still not been sufficiently researched. As far as we know, only a few studies have been published (more precisely three articles and two presentations at scientific conferences), and its proposed biological basis has only been confirmed in one fMRI study (Brown et al, 2013). Some of the author's presumptions, which were verified in this research too, were founded on the immediate results of several previous studies. For example, the positive relation between the dimension *Cautious/Social Norm Compliant* (with the proposed biological basis of serotonin) with religiosity, was proposed on the basis of findings of a correlation between serotonin receptors and self-transcendence, which covers some characteristics of religiosity. Although in this research the hypothesis and results of Fisher et al. (2015) were mostly confirmed, further research is necessary with more complex statistical analyses that will take into account the effects of gender, religiosity, political orientation and different relationship variables for all four dimensions of temperament. Further studies on representative samples are also required. Our sample was specific with most participants of female gender, religious affiliation, high school education and liberal political orientation. Future research dealing with this temperament model according to the propositions by Fisher et al. (2015) is being prepared. There is room for testing different hypotheses stemming from this biological model. Examples of possible future research are testing the temperament dimensions in persons with different sexual orientation, different age groups, cultures, occupations etc.

Conclusions

In conclusion it may be said that hypotheses about the differences between men and women, religious and non-religious, and conservative and liberal participants in relation to some temperament dimensions in Fisher's model were confirmed. Men are more *Analytical/Tough-Minded*, while women are more *Prosocial/Empathetic*. Religious participants had significantly higher results on the *Cautious/Social Norm Compliant* scale. The more conservative participants were also more *Cautious/Social Norm Compliant* and less *Prosocial/Empathetic*. The results did not show any significant difference between participants with different educational status. This research also included the opinion of the participants about sex as an important part of a successful relationship, and the results confirmed the initial presumption in expected directions. The participants who had a stronger opinion about this were more *Curious/Energetic* and *Analytical/Tough-Minded* and less *Cautious/Social Norm Compliant*.

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9

What is Humility and Do We Need It? Validating a Humility Questionnaire

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Abstract

This study aimed to validate the Values in Action Inventory of Strengths (VIA-IS) Humility-Modesty subscale (Peterson & Seligman, 2004) using a Croatian sample (N = 783; 71.6% women). In addition, we assessed the psychometric characteristics (e.g. internal consistency reliability and factor structure) of the measure, congruent validity using a correlation analysis with measures of humility (the Humility-Arrogance Semantic Differential and the Other Focus Scale), convergent validity using the Self-Compassion Scale, and discriminant validity (using the measure of narcissism from the dark triad). Multiple regression analysis was then conducted in order to assess whether humility statistically significantly contributes to the overall satisfaction with life. The factor analysis yielded two factors. The first factor represented modest self-presentation, while the second factor pertained to dispositional humility, an individual's view of oneself as humble. Both factors marginally, but significantly contributed to life satisfaction, suggesting that humility is an important asset. This study's results show the importance of validating constructs across different social settings and call for further research on humility in Croatia and internationally.

Keywords: humility, VIA-IS, Croatia, dark triad, life satisfaction

Introduction

Throughout history humility has been equated with humiliation and low self-regard (Tangney, 2000). Equivalently, descriptions of humility in the Croatian language include a lowly view of self, one's importance and value (Anić, 1998). Nevertheless, rather than a derogatory view of self, researchers are finding humility to be an important virtue related to well-being (Exline & Geyer, 2004). Tangney (2000) offered one of the first attempts at conceptualizing humility: as an accurate view of self, egalitarian values, openness to new ideas and contradictory information and a relatively low self-focus i.e. "forgetting of the self". This multifacetedness encouraged Davis, Worthington, and Hook (2010) to simplify the construct of humility by dividing it into accurate self-perception and modest self-presentation. Humble individuals are not only accurate in how they view themselves, but are honest in the way they present themselves to others. Wright, Nadelhoffer, Ross, and Sinnott-Armstrong (2016) strongly emphasized the importance of focusing on others instead of focusing on oneself. Consequentially, Worthington, Davis, and Hook (2016) posited that humility encompasses two broad domains, intrapersonal and interpersonal humility – the former pertains to individual and the latter to relational qualities. Intrapersonal humility corresponds to Tangney's (2000) accurate view of self, personal strengths, weaknesses and limitations and it refers to the individual. Interpersonal humility refers to the relational qualities, particularly modest self-presentation and an orientation towards others through regulating emotions in a socially acceptable way, others focused behaviour, showing respect and empathy and through a lack of superiority.

Clearly, apart from humility's connotative association with an inferior self-regard in the Croatian language, a major issue is a lack of consensus regarding the definition and operationalization of humility. Humility has been defined as an adaptive form of pride (Cheng, Weidman, & Tracy, 2018), a personality trait (Exline & Hill, 2012; LaBouff, Rowatt, Johnson, Tsang, & McCullough Willerton, 2012; Landrum, 2011), a set of relationship skills (Davis et al., 2011) and a range of metacognitive abilities (Thrive Center for Human Development, 2013). Despite this discord in defining humility, researchers seem to have found what determines it.

Determinants of Humility

Authors seem to agree that one of the key aspects of humility is an accurate view of self - the ability to accurately gauge one's place in the society, one's abilities and success, as well as shortcomings and flaws (Baumeister & Exline, 1999; Emmons, 1999; Rowatt, Ottenbreit, Naselroade, & Cunningham, 2002; Tangney, 2000). The ability to recognize personal limitations and flaws might suggest that a humble individual also has low self-esteem or is self-critical. However, this is inaccurate. Unlike those who are humble, people with low self-esteem (as well as those who are arrogant or narcissistic), have a pronounced self-focus and an unstable sense of worth (Tangney, 2009). Hence, they tend to overestimate how events may affect the self (Ryan, 1983). Their praise-seeking ego might perceive criticism as a threat and when they become aware of any misgivings or shortcomings, they might feel shame, humiliation and anxiety. Consequentially, people with low self-esteem tend to engage in defensive behaviours, such as shifting blame, reactive aggression, self-handicapping and defensive self-enhancement (Bushman & Baumeister, 1998). Humility, however, requires first knowing oneself and then overcoming oneself (Roberts, 1983). This is accomplished by removing oneself from one's own focus and instead focusing on others (Wright et al., 2016).

Orientation towards others (focusing on others) manifests in acknowledging others' needs, beliefs and values, even when they differ from one's own, and having a high interest in others' well-being (Worthington, Davis, & Hook, 2016). It is a sense of connection with others (Wright et al., 2016). A greater desire to

help and contribute to group well-being comes with it (Kunz, 2002). Humility, through focusing on others, enables respect, caring, equality and understanding (Sandage, 1999) and consequentially strengthens relationships with others (Davis et al., 2013). A low self-focus is also beneficial for interpersonal and romantic relations (Davis et al., 2011). When combined with accurate self-perception, low self-focus and high other focus clear the way to having a more open conversation about doubts and mistakes. In other words, humility facilitates an understanding between partners and keeps self-involved emotions such as shame, fear, resentment and the need to control others (Sandage, 1999), which induce aggressive or avoidant behaviours that damage relationships, at bay. Having overcome themselves, humble people no longer need validation or attention. Their self-presentation is modest, void of self-enhancement, self-deprecation and illusions. People who are humble believe that all human beings, including themselves, are inherently worthy, regardless of differences in culture, opinions, education etc. (Tangney, 2000).

Although the literature is not yet clear on which of these determinants constitutes the core of humility as opposed to being its correlates or consequences (Davis et al., 2016), the benefits of humility are clear and there are many.

Correlates and benefits of humility

One of the most obvious correlates of humility is modesty (Peterson & Seligman, 2004), with which humility shares only the quality of modest self-presentation. Other aspects that make humility an eclectic virtue, such as forgetting the self, other focus, egalitarian values, and accurate self-perception are not part of the construct of modesty (Tangney, 2007). In fact, although modesty could be consistent with an inner value of humility, it can also occur as a reaction to situational needs or pressures (Rowatt et al., 2006).

Humility also correlates with forgiveness (Exline, Worthington, Hill, & McCullough, 2003) and gratitude (Exline & Hill, 2012). Humility's low self-focus, and consequently a less self-involved and vulnerable ego, enables solving conflict through reconciliation and forgiveness. Humble individuals understand that anybody can err, and in situations of injustice view themselves as less innocent and those who wronged them as less culpable (Worthington, 2008). Humility is associated with helping others, even after controlling for agreeableness (LaBouff et al., 2012), and therefore relevant for prosocial behaviour (Davis et al., 2016). Positive relationship outcomes, relationship stability (Davis et al., 2013) and relationship satisfaction (Peters, Rowatt, & Johnson, 2011) are also associated with humility.

Based on the aforementioned descriptions of humility, it is not surprising that it negatively correlates with the propensity for exploiting, cheating, manipulation, entitlement, narcissism, Machiavellianism, psychopathy (Lee et al., 2013), revenge (Lee & Ashton, 2012) and exhibitionism (Rowatt et al., 2006), traits that are especially detrimental for organizations. In contrast to them, humility negatively correlates with counterproductive work behaviour (Lee et al., 2013) and benefits the work environment (Owens, Johnson, & Mitchell, 2013).

Higher levels of humility are associated with psychological and physical well-being (Jankowski, Sandage, & Hill, 2013; Krause, 2010; Krause, Pargament, Hill, & Ironson, 2016) whereas lower levels of humility, often associated with narcissism and an increased self-focus, might be a risk factor for developing heart-related problems (Scherwitz & Canick, 1998). With regard to psychological well-being humility is positively correlated with a higher subjective well-being, autonomy, self-acceptance, positive relationships with others, and a sense of purpose in life (Aghababaei, Wasserman, & Nannini, 2014) and it is negatively associated with depression (Sandage, Jankowski, Bissonette, & Paine, 2016) and anxiety (Quiros, 2008). There is, however, mixed evidence for the relationship between humility and self-esteem. Depending on which measure of humility was used, humility was either significantly positively related to self-esteem or the relationship between humility and self-esteem was not significant (Rowatt et al., 2006).

Humility and Life Satisfaction

Humility might, especially in these times of rapid change and high demands, represent an important determinant of life satisfaction and an important resource in creating and maintaining a purposeful life. Life-satisfaction, an assessment of one's own life as a whole (Diener, 2000), tends to be higher among those who report fewer psychological and social problems, for example depression and dysfunctional personal relations (Furr & Funder, 1998). Life satisfaction is also associated with gratitude (Kruse, Chancellor, Ruberton & Lyubomirsky, 2014), openness (Baron, 2000), a higher resilience to stress (Frisch, 2000), and forgiveness (McCullough, 2000). Given that humility is comparably associated with these constructs, it could be expected that humility is positively associated with life satisfaction. This relationship is, however, not as straightforward. Rowatt et al. (2006), for example, confirmed this association, whereas Pollock, Noser, Holden and Ziegler-Hill (2016) did not. There are very few attempts at studying the correlation between the two variables and humility has so far not been used to predict life satisfaction.

However, some questions remain unanswered: does humility function the same way in Croatia, a country in transition, as it does in western, more individualistic countries? Can humility predict life-satisfaction? In order to answer these questions and many more to come in the future, it is important to validate a humility questionnaire on a Croatian sample.

Study Aims

Firstly, the current study aimed to introduce humility, as it is a relatively unknown construct in Croatian psychological research and practice. Secondly, to validate the humility questionnaire Humility-Modesty subscale of the Values in Action Inventory of Strengths (VIA-IS HumilityModesty; Peterson & Seligman, 2004) in a Croatian sample; and thirdly to assess whether humility, due to its multiple benefits, contributes to life-satisfaction, especially given mixed results from previous studies. Given this goal, a humility questionnaire Humility-Modesty subscale of the Values in Action Inventory of Strengths (VIA-IS Humility-Modesty; Peterson & Seligman, 2004) was validated and its metric characteristics examined (convergent validity through correlations with other humility measures, self-compassion and self-esteem; and discriminant validity by analysing the correlations of the humility questionnaire with a dark triad measure). Using the validated questionnaire, it was estimated whether humility can explain life satisfaction variance above and beyond sociodemographic data, self-compassion, the dark triad and self-esteem.

Method and Material

Participants and Procedures

The data were collected in Croatia in the spring 2016 using an online survey tool LimeSurvey. The link to the study was distributed via social networks (private Facebook profiles, Facebook groups), private mailing lists, public forums and websites pertaining to psychological topics by the authors. In order to include a broader sample, personally known participants forwarded and publicly shared the link to the survey website. The time required to complete the survey was between 10 and 15 minutes.

Of the 978 persons who accessed the survey website 783 (71.3% women) individuals proceeded to complete the questionnaire and were included in the analytical sample ($M_{age} = 26.33$, $SD = 9.32$; range = 18-78 years). The missing values were missing completely at random (Little's MCAR $\chi^2 = 140.31$, $p > .52$) with no variable having more than 4% of missing values. The sample was somewhat heterogeneous regarding

the participants' education, with a majority of participants reporting to have completed at least some higher education or received a master's degree. The majority (57.5%) of participants lived in the capital city of Zagreb, 25.3% in other cities and 17.2% in smaller cities and villages. Two thirds of the participants were at the time of the survey still students (70.4%), 19.9% were employed, and 9.7% were unemployed. Most participants assessed their socioeconomic status as average (46%) or slightly above average (36%) (Table 1).

Table 1 *Sociodemographic characteristics*

Variables	Categories	Percentage (%)
Sex	M	28.4%
	F	71.6%
Highest degree of education attained	Primary school	1.3%
	High school	36.5%
	Vocational school	2.7%
	Bachelor's degree	34.4%
	Master's degree	22.0%
	PhD	3.1%
City size	Less than 5 000	11.0%
	5 000-10 000	6.2%
	10 000-100 000	16.5%
	100 000-500 000	8.8%
	More than 500 000	57.5%
Assessment of socioeconomic status	A lot below average	2.6%
	Little below average	11.0%
	Average	46%
	Little above average	36%
	A lot above average	4.5%

Measures

Humility scales

Following the most recent standard of translation (van de Vijver & Tanzer, 2004), questionnaires used in the survey — VIA-IS Humility-Modesty, Humility-Arrogance Semantic Differential Measure and Other Focus — were translated using tripartite translations (a psychologist, a linguist and a layperson) and focus group discussions.

The Humility-Modesty Subscale of the Values in Action Inventory of Strengths (VIA-IS; Peterson & Seligman, 2004) is reported to be a unidimensional 10-item measure of modest self-presentation and low self-focus. Items include statements such as "I never brag about my accomplishments" or "I rarely call attention to myself". Responses are anchored on a 5-point scale, ranging from 1 (*very much unlike me*) to 5 (*very much like me*).

Humility-Arrogance Semantic Differential Measure (Rowatt et al., 2006) is a semantic differential-type 7-item scale that measures humility in opposition to arrogance. Participants reported their answers on a 7-point bipolar rating scale consisting of the following end-labels: humble/arrogant, modest/immodest, respectful/disrespectful, egotistical/not self-centered, conceited/not conceited, intolerant/tolerant, and closed-minded/open-minded. Internal consistency of the scale in this study was at .70. The composite measure was calculated as the average of the responses to all items, with a higher result indicating a higher level of humility.

Other Focus (Wright et al., 2016) is a 5-item measure of focus on other people. The scale consists of items such as “My friends would say I focus more on others than I do on myself” and “My actions are often aimed towards the well-being of others”. The participants anchored their answers on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Internal consistency of the scale in this study was at .86. The composite indicator was calculated as the average of all item responses, with a higher result indicating a higher focus on others.

Other measures used in the study

Short Dark Triad (SD3; Jones & Paulhus, 2014) measures three facets of the dark triad: Machiavellianism, narcissism and psychopathy. Each subscale consists of nine items. Participants anchored their answers on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). In this study, the internal consistency of the Machiavellianism, narcissism and psychopathy subscales were at .82, .72 and .68, respectively. As per author instructions, composites were calculated separately for each subscale, with a higher result indicating a higher propensity for Machiavellianism, narcissism, and psychopathy respectively.

Rosenberg Self-Esteem Scale (Rosenberg, 1965) is a 10-item measure assessing the degree to which a person views themselves as a person of worth where 1 equals strongly disagree and 5 strongly agree. In this study, the internal consistency of the scale was .88. The composite was calculated as the average of all items, with a higher result indicating a higher level of self-esteem.

Self-compassion scale (Neff, 2003) is a 12-item measure of kindness and understanding towards oneself, especially in moments of turmoil, rather than engaging in harsh self-criticism and judgment (e.g. “I try to be understanding and patient towards those aspects of my personality I don’t like.”). In this study, Cronbach’s α was at .74. The composite measure was calculated as the average of all items, with a higher result indicating a higher level of self-compassion.

Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) is a 5-item measure of happiness and well-being (e.g. “I am satisfied with my life”). Answers are anchored on a 5-point response scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Internal consistency was .85. The composite was calculated as the average of all items, with a higher result on the composite variable indicating a higher degree of life satisfaction.

Results

Validating the VIA-IS Humility-Modesty Measure

As it was the case in previous studies (Rosenberg, 1965; Rowatt et al., 2006), both histogram analysis and the Kolmogorov-Smirnov test indicated a slightly negatively asymmetric distribution for life-satisfaction, self-esteem and humility measures (VIA-IS ($K-S = .04; p < .05$) and semantic differential scale ($K-S = .05; p < .05$)). Their residuals, however, followed a normal distribution, which is a prerequisite for making valid inferences from the regression analysis (Field, 2009). Therefore, said variables were not normalised, however, bootstrapping with 2000 resamples was still employed to provide more reliable estimates

of standard errors (Byrne, 2009). As a prerequisite for bootstrapping, missing values were estimated using model-based FIML regression imputation (Newman, 2003).

Prerequisites for factor analysis were met (KMO = .85, Bartlett’s test of sphericity is significant $p < .001$ with $\chi^2(45, N = 783) = 1745.92$). Exploratory factor analysis yielded a Geomin rotated two-factor solution with the correlation between the two factors being at .36 (Table 2). According to the fit indices the two-factor solution ($\chi^2(26) = 77.14, p < .01, TLI = .91, CFI .95, RMSEA = .068; 90\% CI = .051-.086$) fit the data better compared to the one-factor solution ($\chi^2(35) = 173.51, p < .01, TLI = .81, CFI .85, RMSEA = .097; 90\% CI = .083-.111; \Delta\chi^2(9) = 96.36, p < .01$). The same structure was attained on both men and women – there was no significant difference between how the data fit men and how they fit women ($\Delta\chi^2(7) = 5.88, p = .55$). The EFA model fit was evaluated by the standards proposed by Hu & Bentler (1999).

Given that the first factor was saturated with items pertaining to the behavioral manifestations of humility – modest self-presentation and a low self-focus - we named it modest self-presentation. The second factor was saturated with items related to the assessment of one’s own personality characteristics and it was named dispositional humility (Table 2).

In contrast to the unidimensional structure of the VIA-IS Humility-Modesty measure that was reported for the US sample (Peterson & Seligman, 2004), EFA yielded a two-factor structure of the measure in the Croatian sample. Therefore, congruent, convergent and discriminant validity for the Croatian version of the VIA-IS Humility-Modesty measure were evaluated separately for each of the two factors—modest self-presentation and dispositional humility.

Table 2 *Factor loadings for Exploratory Factor Analysis With Geomin Rotation of the VIA-IS Humility-Modesty subscale*

Items	Factor Loadings	
	Modest self-presentation	Dispositional humiltiy
3. I do not act as if I were a special person.	.73	
2. I do not like to stand out in a crowd.	.68	
7. I rarely call attention to myself.	.60	
4. I never brag about my accomplishments.	.61	
6. I prefer to let other people talk about themselves.	.56	
5. I am proud that I am an ordinary person.	.31	
10. People are drawn to me because I am humble.		.71
1. I am always humble about the good things that have happened to me.		.46
8. I have been told that modesty is one of my most notable characteristics.		.45
9. No one would ever describe me as arrogant.		.30

Note. Only saturations $>.30$ are shown in the t

Table 3 Summary of Intercorrelations, Means, and Standard Deviations for Scores on Relevant Variables and Sociodemographic Data

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	M	SD
1. Modest Self-Presentation (VIA-IS factor 1)	-										3.26	.79
2. Dispositional Humility (VIA-IS factor 2)	.63**	-									2.94	.84
3. Humility-Arrogance Semantic Differential Scale	.53**	.66**	-								4.85	.83
4. Other Focus	.24**	.35**	.38**	-							3.46	.84
5. Machiavellianism	-.16**	-.19**	-.33**	-.23**	-						2.70	.71
6. Narcissism	-.56**	-.34**	-.30**	-.10**	.32**	-					2.80	.71
7. Psychopathy	-.29**	-.25**	-.38**	-.17**	.60**	.41**	-				2.17	.74
8. Self-Compassion Scale	.01	.07*	.21**	-.03	-.14**	.15**	-.10**	-			3.10	.67
9. Rosenberg Self-Esteem Scale	-.16**	-.12*	.07	-.05	-.06	.36**	-.04	.60**	-		3.80	.82
10. Satisfaction with Life Scale	-.13**	-.04	.07	-.03	-.08*	.20**	-.07*	.41**	.58**	-	3.90	1.0
Age	.07*	.03	.10**	.09*	-.05	-.05	-.05	.08*	.12**	-.06	26.33	9.32
Sex	.02	.06	.11**	.08*	-.18**	-.08*	-.22**	-.10**	-.07	.01		
City size	-.16*	-.11**	-.04	.02	-.05	.13**	.03	.01	.04	.06		
Highest obtained academic degree	.03	.01	.04	.01	-.11**	-.01	-.20**	.10**	.15**	.08*	3.49	1.30
Socioeconomic Standard	-.06	-.09*	-.05	-.03	.03	.16**	.01	.06	.20**	.40**	3.30	.82

Note. For all scales, higher mean scores are indicative of more extreme responding in the direction of the construct assessed. * $p < .05$, ** $p < .01$.

Both VIA-IS Humility-Modesty subscales were positively correlated with other measures of humility (Table 3), confirming congruent validity of the measure in the Croatian sample. The subscales correlate with the semantic differential scale and with the Other Focus scale, which measures one of humility aspects (orientation towards others, focus on others). Suggesting good discriminant validity of the measure, as expected, both modest self-presentation and dispositional humility were negatively correlated with narcissism, psychopathy and Machiavellianism. Self-compassion correlated only with dispositional humility, although the two constructs were only weakly related. Moreover, both modest self-presentation and dispositional humility were negatively related to self-esteem. Finally, modest self-presentation negatively correlated with life satisfaction, whereas dispositional humility was not significantly associated with life satisfaction.

The results obtained indicate that participants deem themselves as moderately humble (Table 3) which is less humble compared to participants from the US (Rowatt et al, 2006). There are no statistically significant differences between men and women in their self-assessment on the VIAIS Humility-Modesty subscale ($M_{men} = 3.05$; $SD_{men} = .75$; $M_{women} = 3.12$; $SD_{women} = .69$; $t(781) = -1.216$; $p > .05$) which corresponds to the findings of Rowatt et al. (2006).

A hierarchical linear regression analysis was then conducted to assess whether the two VIA-IS humility subscales significantly contribute to life satisfaction while controlling for the contributions of socio-demographic characteristics, the dark triad, self-compassion and self-esteem (Table 4).

All predictor blocks had a statistically significant contribution in the explanation of the outcome variable. Sociodemographic variables in Step 1 explained 17% of variance. Step 2 with the dark triad, self-compassion and self-esteem added to the model explained an additional 29% of the variance. The two humility subscales included in Step 3 explained only about 1% of the variance in life satisfaction. The first VIA-IS factor, modest self-presentation, was a negative predictor of life-satisfaction ($\beta = -.13$, $t = -3.37$, $p < .01$), while the second factor, dispositional humility, positively predicted the outcome ($\beta = .10$, $t = 2.80$, $p < .01$). Self-esteem, as seen in the literature (Diener et al., 1985) had the highest individual contribution ($\beta = .50$, $t = 13.91$, $p < .01$). The analysis explained 47% of the life-satisfaction variance ($R^2 = .47$, $F(12,779) = 57.50$, $p < .01$).

Table 4 Hierarchical Regression Analysis Summary for Variables Predicting Life Satisfaction ($N = 783$)

Variable	Model 1				Model 2				Model 3			
	<i>B</i>	<i>SE B</i>	95% CI	β	<i>B</i>	<i>SE B</i>	95% CI	β	<i>B</i>	<i>SE B</i>	95% CI	β
Age	-.07	1.43	[-.12, -.02]	-.10*	-.09	1.76	[-.14, -.05]	-.14*	-.09	.03	[-.14, -.05]	-.14*
Sex	.08	.03	[-.78, .98]	.01	-.54	.03	[-.21, 1.26]	.04	.47	.39	[-.27, 1.18]	.04
City size	-.01	.46	[-.29, .29]	.00	.05	.39	[-.18, .29]	.01	.02	.12	[-.21, .27]	.01
Highest obtained academic degree	.38	.15	[.00, .77]	.08*	.02	.12	[-.29, .35]	.01	.03	.16	[-.27, .35]	.01
Socioeconomic standard	2.89	.18	[2.34, 3.38]	.39*	2.18	.16	[1.78, 2.59]	.29*	2.23	.21	[1.83, 2.63]	.30*
Machiavellianism					-.01	.03	[-.07, .04]	-.02	.00	.03	[-.07, .05]	-.01
Narcissism					-.03	.03	[-.09, .03]	-.03	-.07	.03	[-.14, .00]	-.07
Psychoopathy					-.03	.04	[-.10, .04]	-.02	-.03	.04	[-.10, .04]	-.03
Self-compassion					.09	.03	[.04, .14]	.12*	.09	.03	[.03, .14]	.12*
Self-esteem					3.62	.27	[3.12, 4.15]	.49*	3.68	.27	[3.18, 4.21]	.50*
VIA-IS Modest self-presentation									-.86	.28	[-1.42, -.27]	-.13*
VIA-IS Dispositional humility									.66	.26	[.18, 1.13]	.10*
R^2												.47*
ΔR^2												.01*
ΔF^2												6.26*

Note. CI = confidence interval for *B*.; * $p < .01$.

Discussion

This study aimed to validate the Croatian version of the humility questionnaire Humility-Modesty subscale of the Values in Action Inventory of Strengths (VIA-IS Humility-Modesty; Peterson & Seligman, 2004) and assess whether humility positively contributes to life-satisfaction. In contrast to Peterson and Seligman's finding that VIA-IS Humility-Modesty scale has a unidimensional structure (2004), the factor analysis yielded a two-factors structure in a Croatian sample— modest self-presentation and dispositional humility. In this discussion we will offer possible explanations for this discrepancy in factor structure.

We then assessed congruent validity (through correlations with the other two humility measures – the Semantic Differential Scale and the Other Focus scale), convergent validity (through correlation with the Self-Compassion Scale), and discriminant validity (through associations with the dark triad, with the emphasis on narcissism) of the two subscales of the Croatian version of the VIA-IS Humility-Modesty questionnaire.

The first factor, modest self-presentation, measures behavioral manifestations of humility and other focus, whereas the second factor pertains to dispositional humility. As expected, both factors are negatively associated with the dark triad (most strongly with narcissism) and they are positively associated with the other measures of humility. However, modest self-presentation was negatively associated with self-esteem and life satisfaction, and no significant relationship was found with self-compassion suggesting an overlap between modest self-presentation and self-esteem. Item content and correlation analyses pointed to a significant association between these two constructs. In other words, modest self-presentation items describe behaviors that may reflect both humility and low self-esteem. For example, the item "I prefer to let other people talk about themselves" or "I do not like to stand out in a crowd" could be interpreted differently depending on one's view of self. To a humble individual "I prefer to let other people talk about themselves" may mean that they don't have a need to talk about themselves because they are more focused on others (Elliot, 2010). In contrast, individuals with low self-esteem may not want to talk about themselves because they believe they are not interesting enough to be listened to. Similarly, unlike humble individuals who are not self-focused, people with low self-esteem may focus on others with the aim of receiving validation and acceptance. Therefore, both someone who is humble and someone who has low self-esteem might have a high result on the modest self-presentation subscale, although the underlying processes are fundamentally different between the two individuals. Although we did control for the contribution of low self-esteem in the regression model, the negative correlation between the modest self-presentation subscale and life-satisfaction may in part be explained by the conceptual overlap between this construct and self-esteem, at least in the Croatian language.

Dispositional humility consists of items that pertain to an individual's humility, modesty and lack of arrogance. Corresponding to both Tangney's (2009) and Van Tongeren, Davis and Hook's (2014) humility definition, Gregg, Hart, Sedikides, & Kumashiro (2008) define modesty as interpersonal agreeableness, caring for others, non-intrusiveness, and a reluctance to brag. As such the item "I have been told that modesty is one of my most notable characteristics" is a part of dispositional humility. Exline, Baumeister, Bushman, Campbell and Finkel (2004), similarly see humility in contrast to aspects of narcissism that include grandeur, entitlement, personal glorification and an overweening opinion of oneself. Narcissistic people score low on humility scales (Exline & Geyer, 2004) which is why the item "No one would ever describe me as arrogant" also constitutes a part of the dispositional humility subscale. Therefore, in accordance with previous literature, dispositional humility was in this study positively related to other humility measures (Rowatt et al., 2006; Wright et al., 2016) and self-compassion and negatively associated with narcissism, Machiavellianism, psychopathy (Lee et al., 2013) and self-esteem.

Finally, multiple regression analysis indicated a small, but significant contribution of VIAIS in ex-

plaining the life satisfaction variance, above and beyond sociodemographic characteristics and other psychological constructs. Although self-esteem and sociodemographic characteristics explain the largest proportion of variance in the model (Diener et al., 1985), the two humility subscales contributed marginally, but significantly to the explanation of the life satisfaction variance. Importantly, however, the contribution of modest self-presentation was negative, supporting the assumption that modest self-presentation measures both humility and behavioral manifestations of low self-esteem. Dispositional humility had a positive contribution in explaining life-satisfaction variance, although it was quite small.

Taken together, our results suggest that VIA-IS might not be an adequate measure of humility in Croatia. First, in contrast to studies conducted in the United States, VIA-IS was found to have a two-factor structure in the Croatian sample. In addition, VIA-IS doesn't seem to encompass all theorized aspects of humility. For example, the measure does not include low self-focus (Emmons, 1999; Exline et al., 2004) or egalitarian values, acceptance of one's limitations and shortcomings, intellectual openness (Davis, Worthington & Hook, 2010), nor an accurate view of self and other focus. Given that this construct may still not be clearly defined or operationalized (i.e. every humility researcher appears to have their own definition) this is not surprising. However, the omission of other focus in VIA-IS appears to be particularly concerning, considering that Tangney (2009) and Worthington, Davis and Hook (2016) theorize that it is other focus that separates humble people from those with low self-esteem. Further on, maybe humility is, despite theory, not a broad enough construct to explain a large percentage of chosen criterion variance. It theoretically overlaps with other constructs such as self-compassion, self-esteem and narcissism that are well-known predictors of life satisfaction, so they might be explaining the same part of life-satisfaction variance. Finally, maybe humility is not relevant or well understood in the Croatian culture. This construct, taken over from individualistic western cultures might require a different operationalization of modest self-presentation in the Croatian setting.

Study contributions and limitations

Validation of the VIA-IS Humility-Modesty in a Croatian sample is the biggest contribution of this study. However, several limitations also need to be mentioned. Compared to paper-pencil research, online surveys are becoming popular because they enable easy access to different populations and have certain financial and organizational advantages. However, the community-based sample used in this study (in which youth, women and highly educated individuals are overrepresented) is not representative of the Croatian population, nor can our results be generalized to the entire Croatian population. Although self-reported data is usually affected by self-enhancement, Landrum (2011) suggested that there are no associations between social desirability and dispositional humility. Furthermore, although this study's results correspond to some of the results reported earlier (such as correlations with other variables), they also suggest that there are important differences between our results and those previously reported in the literature. Specifically, further quantitative and qualitative examinations of the construct should be conducted in order to assess the overlap between humility and other, similar construct—in particular low self-esteem. Since there still lacks a consensus in the literature regarding the definition of humility, such an approach would contribute to the development of a more appropriate humility questionnaire that can be used both in Croatian samples and internationally.

Conclusion

Research has shown that humility is relevant in many areas of life, such as strengthening relationships, (Exline et al., 2003), facilitating conflict resolution and forgiveness (Worthington, 2008), effective self-control (Baumeister & Exline, 1999), focusing on others (Wright et al., 2016), benefitting group well-being (Kunz, 2002) and organizations (Owens, Johnson & Mitchell, 2013). The aim of this study was to validate a Values in Action Inventory of Strengths Humility-Modesty subscale (VIA-IS; Peterson & Seligman, 2004) in a Croatian sample. In contrast to the unidimensionality of the measure that was reported in previous studies, factor analysis yielded two distinct factors—modest self-presentation and dispositional humility. Both factors were negatively associated with the dark triad (most strongly with narcissism) and positively associated with other humility measures assessed in the study. However, modest self-presentation correlated negatively with life-satisfaction, self-esteem and self-compassion, whereas dispositional humility was positively associated with these constructs. In the multivariate assessment, both factors were significantly, albeit in opposite directions, related to life-satisfaction, over and above sociodemographic characteristics, self-esteem, self-compassion, and the dark triad. The percentage of the explained variance was significant, although minor, which may be due to a conceptual overlap between behavioral humility manifestations and low self-esteem (at least in the Croatian language) or it could be due to the fact that some of the key aspects of humility are not included in the VIAIS Humility-Modesty questionnaire. This study's results show the importance of validating constructs across different social settings and call for further research on humility in Croatia and internationally.

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10

Emotional Problems and Specific Irrational Beliefs of Children and Adolescents Suffering from Headaches

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Abstract

In paediatric outpatient clinics, patients with headaches make up for more than a third of the total number of examinations. Studies show that over 70% of school children suffer from headaches at least once a year and that development of headaches can favour many organic, environmental and psychogenic factors. Irrational beliefs play the primary role in the development of many emotional difficulties. Due to irrational beliefs, some children and adolescents continually distort the meaning of events in a negative direction. Catastrophizing plays a crucial role in the development and maintenance of headaches. It leads to over-estimation, rumination, helplessness and greater focus on pain.

Objective: The objectives of this study were to determine whether there is any difference in irrational beliefs and emotional impairment between the clinical and control group of children and adolescents, with the purpose of gaining knowledge for future planning of cognitive-behavioural treatment.

Methods: The research was conducted at the Department of Paediatrics, Clinical Hospital Centre Osijek, among the inpatients and outpatients with headache, as well as in two primary and secondary schools in Osijek. Children and adolescents aged between 10 and 18 were examined (N = 172). The research included the Headache Questi-

onnaire, Irrational Beliefs Test and Beck Youth Inventories- second edition (BYI-II).

Results: The results indicate a significant difference in the level of emotional impairment between the control and clinical group of children and adolescents, with children from the clinical group showing a higher level of emotional impairment, as well as a greater inclination to irrational beliefs.

Conclusion: Children in the clinical group exhibit significantly more emotional disturbances. In addition, higher level of some irrational beliefs has been observed in the clinical group when compared to the control group of schoolchildren. Results will be used to plan cognitive behavioural treatment for children and adolescents

Keywords: headaches, irrational beliefs, emotional impairment, children and adolescents

Introduction

Headache is considered one of the most frequent health concerns in children and adolescents. In the past several decades, it appears that prevalence rates have increased. Today, 66 % - 71% of 12- to 15-year-olds suffer from headaches at least once every three months and 33% - 40% have at least one per week (Straube, Heinen, Ebinger & von Kries, 2013). This leads to hundreds of school absences every month and poorer academic performance (Drake & Ginsburg, 2012). Furthermore, headaches interfere with other daily activities. They are associated with higher rates of social withdrawal, anxiety depressive symptoms, sleep disturbance, excessive daytime sleepiness, and more frequent family conflict (Law, Beals-Erickson, Noel, Claar & Palermo, 2015). According to Bulloch & Tenebein (2000; as cited in Drake & Ginsburg, 2012), paediatric headaches create considerable strain for the healthcare system and represent the third most common cause for children being referred to emergency departments.

Left untreated, paediatric headaches can persist into adulthood. Therefore, effective treatments in childhood are necessary to minimize the negative effect of this condition across one's lifetime.

The genesis, exacerbation and maintenance of headaches are explained by various theories. The biopsychosocial model of chronic pain explains the complex interaction among biological (e.g. genetics), psychological and social/environmental factors in paediatric headache. The psychosocial aspects can be broken down into the categories of behavioural, cognitive and affective influences. The experience of pain is influenced by a variety of cognitive factors such as beliefs, expectations, attention, coping styles and memories about pain. The meaning attributed to pain is individual. The transactional stress model (Lazarus & Folkman, 1984, as cited in Johari-Fard, Goli & Boroumand, 2013) discerns between the primary appraisal (evaluating pain significance as it being benign, threatening or irrelevant) and secondary appraisal (evaluating pain controllability and one's coping resources). Person's affective and behavioural response to pain depends on individual appraisal and beliefs. According to this model, when you see the pain as a threat, you view it as something that will cause future harm, such as reduced efficiency in social and academic field. When you see the pain as benign or irrelevant, you develop a positive stress response and mobilization of physical and psychological activity and involvement.

Irrational beliefs, key notion in cognitive theory and therapy, have also been taken into consideration in this study. Ellis's Rational-Emotive-Behaviour theory is a well-known cognitive theory which identifies irrational beliefs as the main element of human being's mental and behavioural disorders and distress. Studying the impact of irrational beliefs on individuals' mental health, Ellis & Harper (1970) suggested that the presence of irrational beliefs may result in anxiety and depression disorders in the long run (cited in Molavi, Mikaeili & Ghaffari, 2017).

Catastrophizing, an irrational belief that predicts a negative, catastrophic outcome, is widely linked to chronic pain and often present in headache patients. If a headache is seen as harmful and believed to correlate with actual or potential ailment, one may perceive it as more severe, which may trigger escape or avoidance behaviour. Although findings have consistently shown a correlation between pain and catastrophizing, research in this field has continued without a guiding theoretical framework (Johari-Fard et al, 2013).

Many authors have found that youth suffering from chronic headaches exhibit high rates of comorbid psychopathology but the exact nature of this relationship remains unclear. Liakopoulous-Kairis study (2002; as cited in Drake & Ginsburg, 2012) suggests the presence of a comorbid psychiatric disorder in 84% of youth with headaches, most often anxiety (35%) and depressive (23%) disorders. Depressed and anxious persons consistently distort the connotation of events to understand their experiences as negative and self-defeating (Lefebvre, 1981, as cited in Johari-Fard et al, 2013).

In this research, we made efforts to determine whether there is any difference in irrational beliefs

and emotional impairment between the clinical and control group of children and adolescents, with the purpose of gaining knowledge for future planning of cognitive-behavioural treatment.

Participants and Methods

The research included 74 young patients with the ICD-10 diagnosis of headache (both inpatients and outpatients) and 98 healthy control subjects. The patients were recruited between December 2016 and December 2017 at the Department of Paediatrics, University Hospital Centre Osijek, Croatia. The healthy control subjects were recruited in April 2017, in two elementary schools and two high schools. This was a purposive sample matched to the clinical sample by age and gender. We contacted the schools in close proximity to the Hospital and asked them for permission to recruit participants. Once we obtained the permission, we recruited participants from classes that were matched by age. All the participants who consented to join the research were recruited in the control sample.

The entire sample consisted of 69.2% female and 30.8% male participants, in the 10-18 age range ($M=14.32$; $sd=2.39$). Exclusion factors in this research were as follows: (1) the youths had a co-morbid chronic medical condition such as cancer, diabetes or sickle cell disease; (2) the youths had a developmental disability as reported by their parents or (3) the parent or youngster was a non-Croatian speaker. The study was officially approved by the local Ethical Committee of the institution in which the study was conducted. After the aims and procedures of the study were explained to the children, adolescents and their parents, the parents were asked to sign a written informed consent for their children's participation. Their sociodemographic variables were recorded (age, sex, grade, school achievement, place of residence). Researchers then asked children and adolescents to complete the battery of questionnaires about their experiences with headaches and emotional problems. The battery entailed the Headache Questionnaire, Irrational Beliefs Test and Beck Youth Inventories- second edition (BYI-II).

Measures

Headache Questionnaire, elaborated by one of the investigators for the purpose of this study, was made up of 11 items with multiple choice answers, related to the occurrence (e.g. How often do you experience headaches?), duration and localization of headaches (e.g. Where do you feel the pain during headache?), precipitating factors, family heredity, accompanying symptoms, absence from school (e.g. Do you miss school because of headaches?) and headache treatment.

Irrational Beliefs Test is a questionnaire designed for research purposes and includes 44 items. This questionnaire measures different types of irrational beliefs (mental filtering, jumping to conclusions, personalizing, catastrophizing, polarized thinking, making "must" or "should" statements, over-generalizing, labelling, emotional reasoning and magnification and minimization) based on the five-point scale (1=strongly disagree to 5=strongly agree). The items were conceived based on the authors' clinical experience regarding what kind of irrational beliefs occur in patients suffering from headaches. Examples of items are: The headache will never stop; I am weird; I am incapable, etc. Internal consistency was measured with Chronbach's Alpha and it was .93 with all 44 items. As for the particular subscales, Cronbach's Alpha was .48 for mental filtering, .65 for jumping to conclusions, .43 for personalizing, .84 for catastrophizing, .76 for polarized thinking, .73 for making "must" or "should" statements, .68 for over-generalizing, .74 for labelling, .81 for emotional reasoning and .58 for magnification and minimization.

Beck Youth Inventories, Second Edition (BYI-II), evaluate emotional and social impairment in children and adolescents. They are a set of five self-report inventories intended for assessing symptoms of

depression, anxiety, anger, disruptive behaviour and self-concept. Each inventory consists of 20 statements pertaining to feelings, thoughts and behaviours related to emotional and social impairment, which youths rate in terms of how often each statement has been true for them. They are standardised for youths aged 7 to 18 in Croatia (Beck J.S., Beck A., Jolly & Steer, 2011).

Results

Sociodemographic factors of the sample can be seen in Table 1.

Table 1 *Sociodemographic factors of the sample*

	Headache group	Healthy control group	Total
Gender			
Female	58 (78.4)	61 (62.2)	119 (69.2)
Male	16 (21.6)	37 (37.8)	53 (30.8)
Age (years) (Mean±SD)	15.01 (2.18)	13.80 (2.42)	14.32 (2.39)
Place of residence			
Urban area	26 (35.1)	64 (65.3)	90 (52.3)
Rural area	48 (64.9)	34 (34.7)	82 (47.7)
Family circumstances			
Complete family	56 (75.7)	87 (88.8)	143 (83.1)
Incomplete family	18 (24.3)	11 (11.2)	29 (16.9)
School			
Elementary school	27 (36.5)	51 (52.0)	78 (45.3)
High school	47 (63.5)	47 (48.0)	94 (54.7)
School achievement			
Good	2 (2.0)	5 (5.0)	7 (4.1)
Very good	51 (68.9)	50 (51.0)	101 (58.7)
Excellent	21 (28.4)	43 (43.9)	64 (37.2)

Descriptive statistics and reliability test for main variables in clinical and control group can be seen in Table 2.

Table 2 *Descriptive statistics and reliability for main variables in headache and healthy control group*

	Headache group							Healthy control group						
	SC	A	D	C	OG	L	ER	SC	A	D	C	OG	L	ER
<i>M</i>	39.07	21.23	13.22	9.62	8.41	8.81	9.14	38.93	15.51	6.67	7.95	7.56	8.10	8.14
<i>SD</i>	7.19	8.92	9.27	4.26	3.22	3.59	3.49	8.48	9.09	8.05	3.96	3.02	3.78	3.85
Median	39.50	21.00	12.00	8.00	8.00	9.00	9.00	39.00	13.00	8.00	6.00	7.00	7.00	7.00
Mode	34	15	12	6	6	9	5	39	12	5	6	6	5	5
Min-max	20-53	3-42	0-48	5-20	0-17	0-23	0-18	22-59	0-47	0-42	6-25	4-18	5-21	5-23
Skewnes	-.474	.105	.949	1.047	.206	1.099	.311	-.093	.881	1.262	2.888	1.252	1.745	1.765
Kurtosis	.300	-.469	1.582	-.209	-.232	2.830	.069	-.594	.716	1.925	8.951	1.629	2.741	3.323
Cronbach α	.83	.88	.94	.84	.65	.67	.76	.87	.89	.92	.92	.66	.79	.85

Legend: SC-Self concept; A- Anxiety; D- Depression; C- Catastrophizing; OG- Over-generalizing; L- Labelling; ER- Emotional Reasoning

Considering the clinical factors of the headache group, 52.7% of participants started having headaches several years before and only 13.5% of them started having them in the previous year. Most participants (93.2%) experienced their last headache sometime in the previous week. Most participants usually have headaches once a week (41.9%), followed by those who have them several times a week (37.8%), while only a few respondents reported having them once a month or more rarely. Headaches usually last for a few hours (63.5%). Most common form of headache in our sample was temporal headache (32.4%). Regarding the family heredity, 86.5% of participants with headaches reported they had no family members suffering from headaches (Table 3.).

Table 3 *Clinical factors of the headache group*

	Number of participants (%)
When did headaches start?	
Within the last year	10 (13.5)
In the last year or two	25 (33.8)
Several years ago	39 (52.7)
When did the last headache occur?	
Last week	69 (93.2)
Month or more ago	5 (6.8)
How often do headaches occur?	
Daily	11 (14.9)
Once a week	31 (41.9)
Several times a week	28 (37.8)
Once a month or less often	4 (5.4)

How long do headaches last?

Several minutes	16 (21.6)
A few hours	47 (63.5)
Whole day	11 (14.9)

Headache location

Frontal	21 (28.4)
Parietal	11 (14.9)
Temporal	24 (32.4)
Occipital	2 (2.7)
Affecting whole head	16 (21.6)

Family heredity

Existent	10 (13.5)
Non-existent	64 (86.5)

Among the most common precipitating factors are stress/fatigue, weather fluctuation, too much/ too little sleep, noise, physical activity and hunger. Among the symptoms accompanying headaches, participants usually feel dizziness, sensitivity to sound/ light, difficulty concentrating and nausea or vomiting. There are methods and treatments that can alleviate headache. 64.9% of participants reported that sleeping reduces their headache, 31.1% uses head massage, 27% find being in a dark and quiet room helpful and only 20.3% use medications.

This research also examined the irrational belief patterns of young patients with the ICD-10 diagnosis of headache and of healthy control subjects. Table 4 shows the most common irrational beliefs and differences between the two groups. The headache group had a statistically higher tendency of catastrophizing, over generalizing, labelling and emotional reasoning.

Table 4 *Irrational beliefs in clinical and non-clinical group*

Irrational Beliefs	Headache group (%)	Healthy control group (%)	P*
Mental Filtering	4 (2-9)	4 (2-9)	.22
Jumping to Conclusions	9 (4-16)	8 (4-18)	.23
Personalizin	8 (3-12)	7 (3-14)	.49
Catastrophizing	8 (5-20)	6 (6-26)	.00
Polarized Thinking	8 (6-22)	8 (6-23)	.94
Making "must" or "should" statements	15 (0-25)	14 (5-24)	.10
Over-generalizing	8 (0-17)	7 (4-18)	.04
Labelling	9 (0-23)	7 (5-21)	.02
Emotional Reasoning	9 (0-18)	7 (5-23)	.01
Magnification and minimization	9 (0-17)	8 (4-20)	.06

*Mann Whitney U test

Analysis of differences between the two groups suggests that in group of children and adolescents with headaches, it is more likely for high school students to experience anxiety than elementary school students ($t(72) = -3.096$; $p = .00$). There is no difference in the level of self-concept, depression and irrational beliefs between elementary and high school students in the clinical group. Analysis of differences in the control group suggests that high school students are more likely to experience anxiety ($t(96) = -3.292$; $p = .00$) and depression (Mann-Whitney test $z = -2.643$; $p = .00$) than students in elementary school and they also showed statistically higher tendency to over-generalize (Mann-Whitney test $z = -2.356$; $p = .01$), catastrophize (Mann-Whitney test $z = -2.448$; $p = .01$), label (Mann-Whitney test $z = -3.279$; $p = .00$) and use emotional reasoning (Mann-Whitney test $z = -2.392$; $p = .01$). The analysis also suggests that elementary school students in the control group have a higher level of self-concept than high school students ($t(96) = 2.400$; $p = .01$).

Table 5 *Differences in the level of self-concept, anxiety and depression and four irrational beliefs in relation to school*

	Headache group			Healthy control group		
	Elementary school	High school	P^*	Elementary school	High school	P^*
Self-concept	41.07 (7.08)	37.91 (7.08)	.07	40.84 (9.01)	36.85 (7.42)	.01
Anxiety	17.22 (8.50)	23.53 (8.39)	.00	12.75 (7.34)	18.51 (9.89)	.00
Depression	11 (1-28)	13 (0-48)	.10 ^u	6 (0-27)	10 (0-42)	.00 ^u
Catastrophizing	8 (5-19)	8 (6-20)	.33 ^u	6 (6-21)	7 (6-26)	.01 ^u
Over-generalizing	8 (0-14)	8 (4-17)	.59 ^u	6 (4-16)	8 (4-18)	.01 ^u
Labelling	8 (0-15)	9 (5-23)	.05 ^u	6 (5-20)	8 (5-21)	.00 ^u
Emotional Reasoning	9 (0-16)	9 (5-18)	.09 ^u	6 (5-23)	7 (5-22)	.01 ^u

* Student T test; ^u Mann Whitney U test

The analysis of school-related differences suggests that the clinical group of elementary school students has a higher level of anxiety ($t(76) = 2.312$; $p = .02$) and depression (Mann-Whitney test $z = -1.979$; $p = .04$) and has a higher tendency to catastrophize (Mann-Whitney test $z = -4.045$; $p = .00$) and use emotional reasoning (Mann-Whitney test $z = -2.900$; $p = .00$), then elementary school students in the control group. Anxiety is more likely to be experienced by the clinical group of high school students than the ones in the control group ($t(92) = 2.653$; $p = .00$), but there is no difference in the level of self-concept, depression and irrational beliefs when comparing the clinical and the control group of high school students.

Table 6 *Differences in the level of self-concept, anxiety and depression and four irrational beliefs in relation to group*

	Elementary school			High school		
	Headache group	Healthy control group	p	Headache group	Healthy control group	p
Self-concept	41.07 (7.08)	40.84 (9.01)	.90	37.91 (7.08)	36.85 (7.42)	.48
Anxiety	17.22 (8.50)	12.75 (7.34)	.02	23.53 (8.39)	18.51 (9.89)	.00
Depression	11 (1-28)	6 (0-27)	.04 ^u	13 (0-48)	10 (0-42)	.15 ^u

Catastrophizing	8 (5-19)	6 (6-21)	.00 ^u	8 (6-20)	7 (6-26)	.31 ^u
Over-generalizing	8 (0-14)	6 (4-16)	.10 ^u	8 (4-17)	8 (4-18)	.47 ^u
Labelling	8 (0-15)	6 (5-20)	.07 ^u	9 (5-23)	8 (5-21)	.45 ^u
Emotional Reasoning	9 (0-16)	6 (5-23)	.00 ^u	9 (5-18)	7 (5-22)	.62 ^u

* Student T test; ^u Mann Whitney U test

Discussion

Sociodemographic characteristics of the sample suggest a 2:1 ratio with girls prevailing, which is in line with reports from literature (Kirschneck, Römer, Proff & Lippold, 2013). Launer, Terwindt and Ferrari (1999) demonstrated that the prevalence of headache is considerably greater in women and not related to socioeconomic status. Barea, Tannhauser and Rotta (1996) conducted an epidemiologic study of headache among children and adolescents in Brazil, and their research showed that the prevalence of tension-type headache was significantly higher in the female group.

Most of the participants in the headache group were suffering from headaches for several years. In this group, we find significantly more secondary school students than elementary school ones, which is in accordance with previous research on a sample of children and adolescents. Certain international publications showed an increase of the lifetime prevalence of headache from 47.2% in children to 69.5% in adolescents (Aromaa, Rautava, Helenius & Sillanpää, 1998; Gallelli et al, 2005; Ozge, Sasmaz, Cakmak, Kalegasi & Siva, 2010).

Regarding headache duration, the findings of the present study are consistent with findings of the study conducted by Foiadelli et al (2018) on Italian adolescents aged 11–16. The present study showed that mean duration of a headache episode was either a few hours (63.5%), several minutes (21.6%) or the whole day (14.9%). Although the authors used a different methodology, similar results were obtained on the Italian sample. In that research, a headache episode lasted on average less than 30 min in 32.9% of participants, 1 hour in 28.1% of them, 2 hours in 19.3% and several hours in 19.5%.

Family heredity in headaches has been established in numerous studies (Foiadelli et al, 2018; Kröner-Herwig, Heinrich & Morris, 2007; Isensee, Fernandez Castela & Kröner-Herwig, 2016), but that is not the case in the present study. Our study showed that only 13.5% of paediatric headaches were associated with parental headache history. This difference in findings can probably be attributed to different geographical and methodological factors.

With regard to precipitating factors, participants were able to identify the factors leading to headaches. Precipitants were selected by the participants from a list which comprised the main paediatric headache-related precipitants reported in literature (Goto et al, 2017; Taheri, 2017; Wang et al, 2013; Zebenhölder et al, 2016). The reported precipitants, in order of their relevance, were as follows: stress/ fatigue (62.2%), weather fluctuation (45.9%), too much/too little sleep (40.5%), loud noise (35.1%), physical activity (33.8%), hunger (29.7%), menstruation (23%), strong smells (21.6%), using PC/laptop for a long time (20.3%), bright light (18.9%), smoke (18.9%) and certain foods (1.4%) (Fig. 1.). Review of earlier research showed stress, weather fluctuations, hunger and sleep deprivation as the precipitants most frequently mentioned (Kelman, 2007; Robbins, 1994; Rasmussen, 1993), although factors such as menstruation, fatigue, food and bright light are also regularly cited with different prevalence proportions (Fukui, Gonçalves & Strabelli, 2008; Haque, Rahman & Hoque, 2012; Mollaoglu, 2013), possibly because of different socio-cultural aspects of the samples used.

Patients with different types of headache usually complain of various accompanying symptoms.

Those most commonly associated with headache are nausea, vomiting, dizziness and visual disturbances or blurred vision (Weisleder, 2001), which is also confirmed in the present study (45.9% participants in the headache group reported dizziness; 39.2% of them reported sensitivity to sound/light; 37.8% have difficulty concentrating; 29.7% reported nausea or vomiting and 13.5% reported blurred vision). In alleviating headache pain, our participants in the headache group most frequently reported non-pharmacologic measures they find beneficial in alleviating or preventing headaches, including getting an adequate amount of sleep (64.9%), head massage (31.1%) and being in a dark/quiet room (27%). Just 20.3% of participants reported use of medications. The finding on use of medications differs significantly from the results of previous studies, both in Croatia and abroad. In the Italian sample of adolescents, more than two thirds of adolescents (69.15%) reported use of medications for headache control (Foiadelli et al, 2018). In the Croatian epidemiological study of clinical characteristics and prevalence of headache in adolescents, Vuković Cvetković et al. (2014) highlight that almost one third of adolescents takes medications for headache relief, while one fifth has never taken any sort of medication for headache. Overall, girls are more prone to taking medications and they also take more medications per month.

Rahnamay et al. (2013; cited in Molavi et al., 2017) suggested that irrational beliefs are associated with quality of life of patients with migraine. Furthermore, according to Peinzen et al (2005), irrational beliefs play a significant role in the relationship between stress, coping and headaches. In our study, results related to irrational beliefs suggest higher tendency to catastrophize, over-generalize, label and use emotional reasoning within some groups. Specifically, the clinical group of elementary school students has a higher tendency to catastrophize and use emotional reasoning, then elementary school students in the control group. As regards the high school participants, we can also notice a higher levels of some irrational beliefs in the headache group, but that differences were not significant. According to Sullivan, Bishop and Pivik (1995), catastrophic thinking is a significant factor in the domain of pain. In their study, catastrophizers reported significantly more pain-related thoughts, greater emotional distress and intensity of pain than non-catastrophizers. We must not neglect the low internal consistency of certain subscales of the irrational belief questionnaire, which implies the necessity of revising, rejecting certain items, or increasing the number of items for certain subscales. Given that subscales with low consistency were not used in subsequent analyses, they were not given much attention in this study.

Participants with headaches reported higher levels of anxiety compared to the healthy control group, both in elementary and high school. The level of depression was statistically higher in the headache group, but only for elementary school participants. As regards the high school participants, we can also notice a higher level of depression in the headache group, but this difference was not significant.

Liakopoulus-Kairis et al. (2002; cited in Drake & Ginsburg, 2012) found that 84% of adolescents suffering from headaches also had a psychiatric disorder (mostly anxiety and depressive disorder). Other researchers found a similar association between psychiatric disorders and patients with headaches (Breslau & Andreski, 1995; Peinzen et al., 2005). The findings of this study regarding the differences in the level of anxiety and depression related to school indicate that high school students are more anxious and depressed than elementary school students, both in the clinical and the control group. Vulić-Prtorić (2002) demonstrated that high school students (60.4%) are more likely to experience intense fear than elementary school students (56.2%) and Jokić-Begić, Lauri Korajlija & Jurin (2007) study results indicated that intensity of anxiety and depression symptoms increases with child's age. When it comes to self-concept, the results suggest that elementary school students have a higher level of self-concept than students in high school. Scott & Santos de Barona (2011) investigated a similar concept in their longitudinal study and concluded that self-concept ratings remain stable when comparing elementary and high school students if there is no physical transition or any social network changes in the period between elementary and high school.

Furthermore, elementary school students in the control group showed lower tendency to over-gen-

eralize, label and use emotional reasoning compared to high school students. A study in a Nigerian secondary school (Ndika et al., 2009) examined irrational beliefs in relation to age differences and demonstrated that older adolescents agreed less with irrational ideas than younger adolescents. In addition, one Slovakian study (Kordacova, 1998) found significant differences between the youth and adults in the same direction.

Limitations of the study

This study should be evaluated with certain important limitations in mind. Firstly, the sample size is relatively small, due to which the findings of the study may not be generalizable. Secondly, the data were collected only in one hospital, which also may cause the generalizability of the present results to be limited. Thirdly, the use of cross-sectional design was limiting in terms of making causal inferences. Furthermore, self-rated scales were used for evaluating emotional symptoms instead of objective assessment. We also cannot ignore the potential impact of other factors which were not investigated in this study (e.g. personality traits, parental perception about the headache).

Conclusion

This study examined the difference in irrational beliefs and emotional impairments between the clinical and control group of children and adolescents. Following an analysis, it was concluded that there is a significant difference in the level of anxiety between the control and the clinical group of children and adolescents, both in elementary and high school participants. Elementary school participants from the clinical group showed a higher level of anxiety and depression, as well as greater inclination to some irrational beliefs. These results may prompt the devising of prevention and treatment programs for patients suffering from headache.

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11

Personality and Dressing Style: Cues and Stereotypes

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Abstract

Research have shown that a relatively accurate judgement of some personality traits can be achieved even when judgements are based on very small amount of information, such as short videos or photographs. It has also been found that some cues leading to accurate judgment were related to characteristics of physical appearance such as dressing style. The aims of the present study were to examine to what extent personality is manifested in a dressing style, to what degree accurate personality judgment based solely on this type of information can be achieved, and what aspects of target persons' dressing style observers use in their judgments. Personality traits examined included the Big Five traits, affective traits, and narcissism. Group of 10 judges rated personalities of 74 target persons based on photographs of them in their favorite clothes, and the accuracy of those judgments was examined. Independent group of coders rated the level of presence of different dressing style cues, and the relationship of those cues with target persons' self-ratings and with judges' ratings was also examined. The achieved level of accuracy was quite low, but there were some valid cues to personality even in this type of context. Valid cues were not used by the judges, who used larger numbers of other cues instead. The results obtained indicate that, when they have small amount of information at their disposal, observers' judgments rely on stereotypes that have been found mostly inaccurate.

Keywords: first impressions, dressing style, personality perception, stereotypes

Are we what we wear, or relations between our personality and dressing style exist only in the eye of the beholder? Our physical appearance is in many cases the very first information available to others, including both face-to-face and on-line contexts, and our dressing style could drive initial perceptions of our personality, so the question is in what direction. The possibility of a relatively accurate personality perception has been found even when judgements were based on very small amount of information, like a short encounter (e.g. Beer and Watson, 2008), or even photograph (e.g. Borkenau, Brecke, Möttig, & Paelecke, 2009). Judgements can be based on different cues, and studies have found that some of these cues were related to characteristics such as facial expression or voice tone, and some of them were related to a dressing style (e.g. Borkenau & Liebler, 1992; Naumann, Vazire, Rentfrow, & Gosling, 2009).

It has also been shown that personality can be expressed in personal spaces like offices and bedrooms, and Gosling and colleagues (Gosling, Gaddis, & Vazire 2008; Gosling, Ko, Mannarelli, & Morris, 2002) suggested three mechanisms through which this expression is possible. One of those mechanisms are identity claims that can be defined as symbolic statements intended to reinforce our own self-views, or statements directed to others about the way we would like to be regarded. Dressing style can be regarded as a source of identity claims, containing symbols reflecting someone's identity (Naumann et al., 2009). There is also evidence that personal possessions are linked to personality (e.g. Burroghs, Drews, & Hallman, 1991; Gillath, Bahns, Ge, & Crandall, 2012), but in previous research there was a great diversity in individual differences and possessions examined, and research in this domain relied mostly on self-reports about someone's possessions (Graham, Sandy, & Gosling, 2011). Taken together, these findings indicate that personality could be manifested in a dressing style, so the question is to what extent.

Manifestations of personality in physical appearance

The role of physical appearance in personality impressions can be examined within the *zero-acquaintance* paradigm, which indicates context in which participants are neither acquainted with target persons, nor have they ever interacted, so all judgments are based on target persons' physical and/or nonverbal characteristics (Albright, Kenny, & Malloy, 1988). Key feature of research conducted within this paradigm is the absence of interaction, and although the most typical approach encompasses judgments of persons who are physically present, it can also include videos or photographs (Kenny & West, 2008). When it comes to traits, a meta-analysis of accuracy of strangers' judgments of basic personality traits showed that even in this context some degree of accuracy can be achieved, and extraversion was perceived with the highest level of accuracy, followed by conscientiousness (Connelly & Ones, 2010). Although in all these contexts judgments were made by strangers, they differ by the amount of information and cues available to observers.

In the study by Albright et al. (1988) previously unacquainted participants rated each other's personality, and there was no any interaction between them. Conscientiousness was the most accurately judged trait, followed by extraversion. Albright et al. (1988) also examined relationship of few physical appearance variables with observers' judgments of personality, and primary basis for judgments of extraversion was the judgment of physical attractiveness, while primary basis for judgments of conscientiousness were formal and neat dress style.

In Borkenau and Liebler's (1992) classic study, target persons were videotaped entering a room, sitting behind a desk, reading a standard text, and leaving the room. Observer judgments were made in four conditions: video with sound, video without sound, still extracted from the video, or audio extracted from the video. In conditions with visual information present, extraversion was judged with the highest level of accuracy among the basic traits, followed by conscientiousness, and accuracy was lowest for emotional stability. Higher accuracy of judgments of extraversion and conscientiousness compared to other basic traits was replicated in later study (Borkenau & Liebler, 1993), and in the study where observers watched a

short video of different content (Carney, Colvin, & Hall, 2007). Another finding from Borkenau and Liebler's (1992) study was that when judgements were based on videotape cues that led to accurate judgement of extraversion were both visual, and acoustic. However, cues that led to accurate judgment of conscientiousness were almost entirely the visual ones (Borkenau & Liebler, 1992; 1995). This finding is in accordance with Albright et al. (1988) study, where there were no acoustic cues so conscientiousness was judged with higher accuracy than extraversion.

Contrary to these findings, in Beer and Watson's (2010) study, where judgments were based on photographs and videos, extraversion was judged with some degree of accuracy, while conscientiousness was not. In the study of Naumann et al. (2009), where judgements were based on the whole body photographs, there was also lack of accuracy in conscientiousness judgments, while extraversion was again most accurately judged basic personality trait. In a condition where participants were free to adopt a spontaneous pose and facial expression, there was also accuracy in openness judgements. In the research of Naumann et al. (2009) valid indicators for extraversion included both static and dynamic physical appearance cues, and the most valid static cues included healthy, stylish and neat appearance. When it comes to conscientiousness, the only valid static cue was undistinctive appearance, while neat appearance was to a smaller degree valid (and not significant) indicator of this trait. However, authors pointed out that the reason for observers not being able to judge conscientiousness correctly, as well as for lack of valid cues, possibly lies in restricted range of cues related to this trait since in their study student sample was used.

In all of the above mentioned research, videos and photos were taken by the researchers, and participants were not aware they will be filmed or photographed. In a research where judgments were based on target persons' self-portrait photographs (i.e. "selfies") most accurately judged basic personality trait was openness (Qiu, Lu, Yang, Qu, & Zhu, 2015). In a research design that employed five most recent selfies of target persons, conscientiousness was most accurately judged basic personality trait, followed by openness and extraversion (Kaurin, Heil, Wessa, Egloff, & Hirschmüller, 2018). Higher visibility of openness in photographs that allow more freedom of expression, as well as different backgrounds, is in accordance with the results of the study of Naumann et al. (2009).

Another trait that has received research attention is narcissism, since it was proposed that narcissists would be more likely to favour designer and expensive clothes in order to sustain and elevate their self-positivity (Sedikides, Gregg, Cisek, & Hart, 2007). It has been shown that narcissism is correlated with flashy and neat dress (Back, Schmukle, & Egloff, 2010), and that this trait can be judged accurately based on whole body photos in standardized position. Valid cues of this trait included expensive and stylish clothes, an appearance that seemed to take a lot of preparation, attractiveness, as well as neat and organized appearance, and most of these cues were used by the observers in their judgements of this trait (Vazire, Naumann, Rentfrow, & Gosling, 2008). Accurate judgement of this trait was also obtained when judgements were based on selfies (Kaurin et al., 2018).

In research where personality judgments were based on videos, observers had access to target persons' other physical characteristics, like movements or tone of the voice, while in research where judgments were based on photographs observers had access to information about facial characteristics and/or expression. Therefore, it was not entirely possible to determine to what extent is personality manifested in dressing style alone. Another related issue is which aspects of dressing style, in the absence of other information, observers use in their judgments of someone's personality.

Conceptual framework: Lens model

The links between personality traits and dressing style, and between dressing style and observers' perceptions of target persons personalities can be conceptualized in terms of lens model (e.g. Borkenau

& Liebler, 1992; Gosling et al., 2002; Nestler & Back, 2013). An example of the model is shown in Figure 1. Within this framework, dressing style characteristics i.e. cues can be considered lenses through which observer perceives, or judges someone's personality.

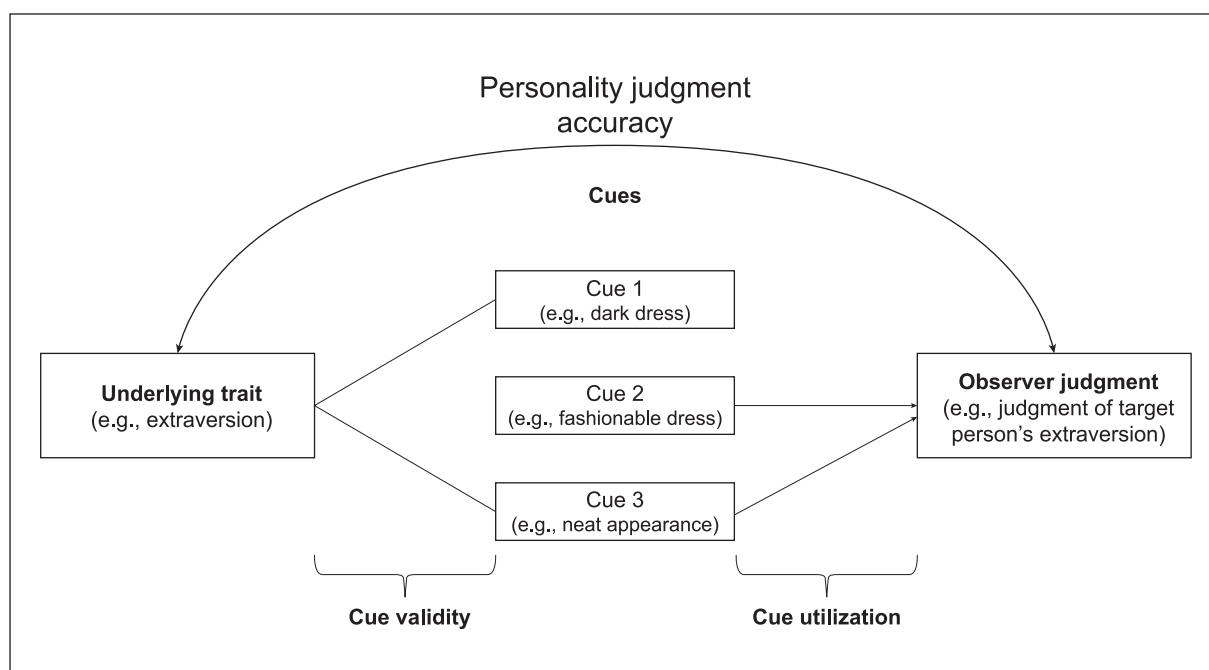


Figure 1 Lens model describing the process of personality judgment based on dressing style.

The extent to which an observable cue is a valid indicator of underlying personality trait is called *cue validity*. For example, fashionable dress may be a valid indicator of extraversion. The other side of the model is *cue utilization*, or the extent to which some observable cue is related to observer judgement of personality trait. For example, cue utilized by observers in their judgments of extraversion could include dark clothing, or neat appearance. Accuracy in underlying trait judgments is achieved when there are valid cues for that trait, and when those cues are utilized by the observer. So, if fashionable dress is a valid cue for extraversion, and observers utilize this cue in their judgments, this can result in accurate judgments of extraversion.

Current study

The aims of the current study were to examine whether it is possible to judge personality with some degree of accuracy based on the dressing style, to what extent personality is manifested in dressing style characteristics, and which dressing style characteristics are related to observers' judgements. We asked the participants to photograph themselves rather than standardize their positions because spontaneous position consists of more personality-relevant cues and leads to a greater accuracy in personality judgements (Naumann et al., 2009). In order to increase outfit variability, participants were asked to send us photos of their favourite outfit, and a group of judges rated their personalities based on those photographs. An independent group of coders rated the level of presence of various dressing style cues in order to examine the relationship of those cues with target persons' personalities, and with judges' ratings. The relationship between the level of presence of dressing style cues and target persons' self-ratings was treated as an indicator of cue validity, while the relationship between the level of presence of those cues and judges' ratings was treated as an indicator of cue utilization.

Although extraversion was most accurately judged in most of the described research, cues that led

to accurate judgment of this trait were less based on clothing compared to conscientiousness. In Borkenau and Liebler's (1995) study, accuracy of judgments of conscientiousness was almost entirely mediated by target persons' refinement of appearance, therefore we expected that this trait will be judged with the highest degree of accuracy of basic traits. Besides conscientiousness, some degree of accuracy was also expected for narcissism, since this trait is also manifested in different dressing styles. Although less examined than the basic personality traits in this type of research, affective traits were included in order to capture a broader range of traits, and it has been shown that these traits can also be judged accurately in a context with a small amount of available information (Carney et al., 2007). A study of Watson, Hubbard and Wiese (2000) included self- and other-ratings in samples of friends, dating couples, and married couples, and it has been found that the positive affect was highly correlated with extraversion, while neuroticism was highly correlated with negative affect in both self- and other-ratings (r 's > .50). However, both extraversion and neuroticism had higher self-other agreement correlations in all three samples of participants, indicating differences in visibility of these traits. In the study of Carney et al. (2007), where judgements were based on short video clips of strangers, extraversion was judged with a higher degree of accuracy compared to positive affect, while negative affect was judged with a higher degree of accuracy than neuroticism. Taken together, these findings could indicate that basic and affective traits are expressed via different cues, and/or that different cues are used in their judgements.

Method

Participants

Target participants (participants who sent photographs of themselves in their favorite outfit) were students of the Faculty of Humanities and Social Sciences, University of Zagreb, Croatia, and all students whose e-mail address was on the Faculty's IT department mailing list received an e-mail invitation to participate in a larger study. Total of 74 of them participated in this part of the research (11 male, age range: 18 – 44, $M = 22.8$, $SD = 4.13$). A sample of judges was consisted of ten participants, five of each gender (age range: 28 – 38, $M = 33.7$, $SD = 3.65$) who were not acquainted with target persons, nor they had ever been in contact. None of the judges has ever taken any psychology courses.

Measures

Big Five. Big Five dimensions were measured using Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003), where each dimension is measured with two pairs of traits. For each pair of traits, target participants were asked to rate to what extent it applies to them on a 7-point scale (1 = *disagree strongly* and 7 = *agree strongly*). Cronbach's alpha reliabilities for self-ratings were .67 for extraversion, .18 for agreeableness, .64 for conscientiousness, .55 for emotional stability, and almost zero for openness. Although reliabilities were low, especially for agreeableness and openness, it should be taken into account that that questionnaire emphasized content validity considerations in order to capture breadth of the traits, and since only two items per trait were used, a higher reliability would indicate high content overlap (Gosling et al., 2003). Reliabilities of aggregated judges' ratings (i.e. averaged across judges and items) were .70 for extraversion, .51 for agreeableness, .53 for conscientiousness, .58 for emotional stability, and .66 for openness.

Affective traits. Affective traits were measured using the Positive and Negative Affect Schedule (PANAS – Watson, Clark, & Tellegen, 1988), with ten items for each affect. For each item, participants were asked to rate how often they generally feel that way on a 5-point scale (0 = *slightly or not at all* and 4 = *all*

the time). Example items include “interested” or “determined” for positive affect, and “upset” or “nervous” for negative affect. Cronbach’s alpha reliabilities for negative and positive affect were .86 and .83 for self-ratings, and .88 and .90 for aggregated judges’ ratings, respectively.

Narcissism. Narcissism was measured using subscale of Short Dark Triad (SD3; Jones & Paulhus, 2014), consisted of nine items. Participants were asked to indicate agreement with each item on a 5-point scale (1 = *strongly disagree* and 5 = *strongly agree*). Sample items include “Many group activities tend to be dull without me” or “I have been compared to famous people”. Alpha reliability for self-ratings was .66, and .92 for aggregated judges’ ratings.

Cues

Potential dressing style correlates of target persons’ personalities, or those of observers’ judgments were selected based on previous research (e.g. Borkenau & Liebler, 1995; Beer & Watson, 2010; Vazire et al., 2008) and upon the examination of photographs. A total of 26 cues was selected, with 12 of them pertaining to overall impression (e.g. attractive, distinctive appearance), and 14 of them pertaining to clothing (e.g. dark, refined). Three independent coders rated dressing style cues on a 7-point bipolar scales. None of the coders knew any of the target participants. One cue (relaxed stance) was removed from the analysis due to a low reliability (Cronbach $\alpha = .18$), while reliabilities for other cues ranged from .55 to .92.

Procedure

All data collection was carried out online. For target persons, the invitation to participate was sent via e-mail by Faculty’s IT department to all students of Faculty of Humanities and Social Sciences, University of Zagreb. Invitation contained short description of the research, and link to an online platform where participants filled out the questionnaires. After participants completed all the questionnaires, they were asked to upload photograph of themselves in their favorite outfit where the whole outfit was visible. They were also told that their head should not be visible, and if it was visible, it was removed from the photograph. Personality judgments were also carried out online, and each judge received a link to a set of targets persons to judge. Each judge rated 29 or 30 target persons, and each target person was rated by four judges (two of them female, and two of them male).

Results

The accuracy was defined as single judge and average judge accuracy. Single judge accuracy is average Pearson correlation between target persons’ self-ratings and each of judges’ ratings, where judge-level correlations were firstly transformed into *z*-values using the Fisher *r*-to-*z* transformation, averaged and then re-transformed into correlation coefficients. Average judge accuracy is Pearson correlation coefficient between target persons’ self-ratings and judges’ ratings averaged across judges and items. Accuracy correlations are shown in Table 1. At single judge level, none of the traits was judged accurately, while at the aggregated judge level accuracy for conscientiousness was marginally statistically significant.

Table 1 *Accuracy of Personality Judgments*

Personality trait	Single judge	Average judge
Extraversion	.12	.12
Agreeableness	.06	.04
Conscientiousness	.11	.20†
Emotional stability	.08	.11

Openness	.12	.08
Negative affect	.05	-.01
Positive affect	-.02	-.04
Narcissism	.11	.10

Note. Single judge accuracy is the average of 10 Pearson correlations between self-reports and judges' ratings calculated with Fisher r-to-z transformation; average judge accuracy is Pearson correlation between average of judges' ratings and the target person's self-report; * $p < .05$. ** $p < .01$. † $p < .10$.

Cue validity and cue utilization in judgments of Big Five personality traits are shown in Table 2. Colourful clothes were a valid indicator for the largest number of traits, including extraversion, conscientiousness, and emotional stability. Conscientiousness and emotional stability each had two valid cues, while none of the examined cues was a valid indicator of openness. The largest number of cues was utilized in judgements of extraversion, while the smallest number of them was utilized in judgments of emotional stability and openness. None of the valid cues was utilized by the judges.

Table 2 *Big Five Traits Cue Validity and Cue Utilization*

Cue validity correlations					Cue	Cue utilization correlations				
E	A	C	ES	O		E	A	C	ES	O
-.02	.05	-.19	-.05	.03	Attractive	.31**	-.12	.25*	.15	.12
.02	.07	.04	.13	-.05	Stout physique	-.19	-.08	-.05	-.02	-.45**
.04	-.02	-.15	.10	.06	Muscular physique	.35**	-.34**	.02	.09	-.20
-.01	-.01	-.17	.05	.09	Proportioned body	.31**	-.09	.15	.20	.05
.23†	-.05	-.14	.02	.02	Self-assured stance	.60**	-.41**	.03	.11	.08
.16	.10	.03	.00	.05	Energetic stance	.64**	-.24*	.21	.29*	.12
-.01	-.12	-.14	-.16	-.09	A lot of effort	.30**	-.21†	.34**	-.02	.00
-.15	.11	.06	.04	.05	Neat appearance	.07	.04	.35**	.23†	-.11
.15	-.19	-.17	-.14	.13	Distinctive appearance	.33**	-.21†	-.03	-.13	.23†
.10	.06	.11	.19	.05	Mature dressing style	-.11	-.12	.10	.07	-.36**
-.11	-.07	-.19	-.14	-.16	Dark clothing	.05	-.12	-.19	-.30*	.04
.28*	.04	.28*	.26*	.19	Colourful clothing	-.08	.27*	.03	.24*	.01
.14	-.20	-.25*	-.15	.04	Showy clothing	.36**	-.26*	-.04	-.10	.15
.03	.01	-.04	.04	.03	Formal clothing	.27*	-.30**	.29*	.07	-.11
-.09	-.14	-.20†	-.26*	-.06	Fashionable clothing	.28*	-.04	-.12	-.13	.43**
.02	.07	-.01	.01	.03	Refined clothing	.35**	-.18	.39**	.14	.04
-.02	.09	-.11	-.01	.05	Elegant clothing	.31**	-.18	.31**	.12	-.03
.10	.00	-.07	.00	.02	Dressy	.32**	-.32**	.24*	.03	-.07
-.19	.11	.09	.06	.10	Casual	-.24*	.43**	-.12	.06	.21

-.02	.12	-.08	-.09	-.02	Seems expensive	.28*	-.21†	.33**	.17	-.04
-.17	.04	.17	.10	.15	Seems comfortable	-.17	.46**	.01	.27*	.26*
.05	.03	-.22†	-.07	.00	Revealing	.44**	-.30**	.12	.01	.05
.06	-.28*	-.14	-.09	-.07	Subcultural	.07	.04	-.16	-.28*	.42**
.13	-.04	-.06	-.05	-.18	Accessories	.29*	-.15	.17	.06	.11

Note. Correlations are Pearson correlation coefficients between the level of presence of each cue and target persons' self-ratings (cue validity) and between the level of presence of each cue and judges ratings (cue utilization). E = extraversion; A = agreeableness; C = conscientiousness; ES = emotional stability; O = openness.

* $p < .05$. ** $p < .01$. † $p < .10$.

When it comes to affective traits, again none of the valid cues was utilized by the judges (Table 3). Colourful clothes were a valid indicator of positive affect, while there was the opposite relation of this cue with negative affect. Clothing that seems comfortable was also a valid indicator of positive affect. As it was the case with the Big Five traits, there was more utilized than valid cues for both traits. Interesting to note, more cues were utilized in judgments of positive than negative affect.

Table 3 *Affective Traits Cue Validity and Cue Utilization*

Cue validity correlations		Cue	Cue utilization correlations	
NA	PA		NA	PA
.05	-.09	Attractive	-.21†	.33**
-.13	.05	Stout physique	.27*	-.09
-.10	.07	Muscular physique	-.25*	.19
-.10	.02	Proportioned body	-.41**	.23*
.03	.14	Self-assured stance	-.36**	.32**
.07	.06	Energetic stance	-.61**	.36**
.09	-.19	A lot of effort	-.11	.38**
.15	.04	Distinctive appearance	-.13	.24*
-.28*	.27*	Colourful	-.06	.13
.10	-.03	Showy	-.17	.34**
-.04	-.10	Formal	-.07	.21†
.19	.04	Fashionable	-.23†	.25*
-.06	-.10	Refined	-.21†	.33**
.00	-.13	Elegant	-.20	.33**
-.06	-.14	Dressy	-.15	.26*
-.02	-.07	Seems expensive	-.18	.40**

.07	.25*	Seems comfortable	-.21	-.07
.02	-.13	Revealing	-.21	.37**
.12	-.04	Accessories	-.06	.43**

Note. Note. Correlations are Pearson correlation coefficients between the level of presence of each cue and target persons' self-ratings (cue validity) and between the level of presence of each cue and judges ratings (cue utilization). NA = negative affect; PA = positive affect.

* $p < .05$. ** $p < .01$. † $p < .10$.

One final trait that was examined was narcissism. Contrary to expectations, none of the examined cues was valid indicator of this trait (Table 4). However, there was a number of utilized cues. For example, participants in reveling clothes, clothes that seemed expensive or elegant were judged as narcissists.

Table 4 *Narcissism Cue Validity and Cue Utilization*

Cue validity correlations	Cue	Cue utilization correlations
.10	Attractive	.43**
.04	Muscular physique	.53**
.13	Proportioned body	.42**
.17	Self-assured stance	.61**
.05	Energetic stance	.55**
.07	A lot of effort	.53**
.01	Neat appearance	.27*
.09	Distinctive appearance	.36**
-.02	Showy	.42**
.17	Formal	.47**
.19	Refined	.52**
.09	Elegant	.51**
.09	Dressy	.51**
-.16	Casual	-.43**
.17	Seems expensive	.52**
-.04	Seems comfortable	-.32**
.00	Revealing	.57**
.18	Accessories	.39**

Note. Correlations are Pearson correlation coefficients between the level of presence of each cue and target persons' self-ratings (cue validity) and between the level of presence of each cue and judges ratings (cue utilization). * $p < .05$. ** $p < .01$. † $p < .10$.

Discussion

This study was conducted in order to examine how personality is manifested in dressing style, to what extent accurate personality judgment based solely on this type of information can be achieved, and what aspects of dressing style are used when observers try to infer someone's personality based on dressing style. Although the achieved level of accuracy was quite low, there were some valid indicators of personality even in this type of context. Those indicators were not used by the judges, but a larger number of indicators used instead was identified.

Accuracy correlations from this study were lower compared to those from other studies in which the whole body photographs, including face, were present (e.g. Naumann et al., 2009). This is especially true for judgements of extraversion, which has been identified as the most visible Big Five trait in research where judgments were made by strangers (Connely & Ones, 2010). At one hand, it should be noted that Big Five traits were measured with a short instrument in order to decrease the judges' burden, but as a consequence those traits were measured with a lower level of reliability which could have resulted with lower correlations. On the other hand, lack of accuracy in judgments of this trait could indicate that face cues carry some additional information on this trait that could be needed to correctly infer to what extent is someone extraverted. This is in accordance with the finding that extraversion can be judged relatively accurately even on the basis of the photograph of someone's face (Borkenau et al., 2009).

Some degree of accuracy was achieved in judgments of conscientiousness, giving tentative support to the notion that accuracy in judging this trait is to a large extent based on dressing style (Borkenau & Liebler, 1995). However, correlation was low and only marginally statistically significant, and none of the examined cues were both a valid indicator of this trait and at the same time utilized by the judges, although it is possible that judges utilized some valid cues that we did not measure. Valid cues to this trait that were identified in previous research included, for example, refined appearance, as well as formal dress (Borkenau & Liebler, 1992; 1995). Although the validity of these cues was not confirmed in this research, observers utilized them in their judgments. It was also expected that a dressing style will contain at least some of the cues valid to narcissism, like neat appearance, or expensive clothes (Back et al., 2010; Vazire et al., 2008) which was not confirmed. As in the case of conscientiousness, those cues were utilized by the judges.

In most previous research participants were not aware that they will be videoed or photographed, which leads to a question whether our participants altered their usual appearance in order to achieve a particular impression. For example, it has been found that it is possible to control the impressions of some personality traits in photographs using only different poses (Leikas, Verkasalo, & Lönnqvist, 2013). It has also been found that satisfaction with outfit is positively related to well-being and happiness, so when people are satisfied with the way they dressed, or when someone compliments the way they dressed they feel better about themselves (Nezlek, Mochort, & Cypriańska, 2018). Since our participants were aware someone will see their photographs, it is possible that they sent photographs of clothing they do not usually wear, which could have led to the lack of valid cues. However, this assumption should be tested in a controlled setting.

Although the number of valid cues to traits examined was small, the opposite was true for the number of cues observers utilized in their judgments, and this is the most consistent finding across all examined traits. Kenny's (2004) theoretical model named PERSON predicts that categorical information, or what was usually meant by stereotypes tends to dominate initial impressions, and their share in impressions declines as the acquaintance increases. In other words, when observers have little information on target persons, their impressions are to a large extent based on stereotypes. As the available information about target persons increases, stereotypes are given less weight in overall impressions. This prediction was confirmed empirically, as well as the prediction that stereotypes impair initial judgments only if they do not contain a kernel of truth. If stereotypes contain a kernel of truth, they can improve the accuracy of first impressions

(Holleran, Mehl, & Levitt, 2009). When applied to our research setting, this could mean that a dressing style holds a very small amount of information about someone, so in the absence of available cues observers relied on stereotypes in their judgments. Cues that they utilized in their judgments were not valid indicators of personality traits judged, meaning their stereotypes did not contain a kernel of truth, so their judgments were not accurate.

When considering the results of the present study, it should be taken into account that our sample of target persons was rather small, and predominately female. For this reason analyses could not be performed separately for each gender although there could be differences in accuracy of personality judgments of male and female target participants (e.g. Naumann et al., 2009). Due to a relatively small sample, it is also possible that we did not have enough statistical power to detect accuracy correlations that exist at the population level, especially if we take into consideration that basic personality traits were measured using a short instrument, and consequently with lower reliability. A short instrument was chosen in order to decrease judges' burden, but it has certain limitations, which are demonstrated in the Croatian validation of the instrument used in this study (Tatalović Vorkapić, 2016). Low reliability could be a result of the short instrument used, particular sample, or the need for adaptation of some items. Although our participants were free to choose the outfit on which judgments were based, it is possible that cue expression was restricted in range since they were all students who study at the same faculty. Similar educational interests, and especially age restriction, could have decreased variability in dressing style since younger people probably dress more similar to each other compared to older people.

Nevertheless, the results of the present study imply that individuals may choose to alter their dressing style in order to convey a particular impression, but this hypothesis should be tested in a controlled setting. Another implication pertains to inaccurate stereotypes based on dressing style, which can have real-life consequences for the person being judged. Further research should therefore test if these stereotypes resulted from the lack of available information, or they are a part of some implicit personality theory. For example, Beer and Watson (2010) showed that provision of only one trait-implying sentence can increase accuracy not only for the trait in question, but also for other judged traits. In a context where personality judgments were based on physical appearance, an information about the target person's face may not only increase personality perception accuracy, but can also reduce stereotypes resulting from a small number of available cues.

Conclusions

The question that this research has tried to answer was whether we are what we wear, or whether the relations between our personality and dressing style exist only in the eye of the beholder. The accuracy of personality judgments based on dressing style was low, but there were some valid cues to personality even in this type of context. However, different set of cues were utilized by the judges. This indicates that the observers' judgments rely on stereotypes that are mostly inaccurate when they have a small amount of information at their disposal. Therefore, according to our findings, we are what we wear only to a small degree, and there are some illusory stereotypes in the eye of the beholder, at least when the amount of available information is limited only to dressing style.

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12

Who's That girl? Facial Appearance Based Inferences

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Abstract

People automatically make inferences from other's appearance, and there is evidence that personality judgements have substantial accuracy for some traits, such as trustworthiness. However, interpersonal intuition is prone to error, so the validity of appearance-based inferences has been repeatedly questioned, and research has never conclusively established a relationship between facial appearance and participation in criminal activities. Therefore, the aims of this study were to examine: 1. participants' competence to differentiate between criminals and non-criminals based on the facial appearance, 2. gender differences in the ability to distinguish between criminals and non-criminals, and 3. associations between confidence in judging others and accuracy of differentiating between criminals and non-criminals. The study was conducted on-line. Convenience sample of 832 adult internet users took part in this study. Participants' average age was 24, they were mostly females (81%), with at least a high school diploma (55%). Participants had to estimate how much confidence they have in their own judgements of other people, and then if each of 20 presented faces looks like a criminal's. The average accuracy of (non)criminality ratings for all photographs was 57%. The accuracy of the estimated non-criminality was higher (70%) than the accuracy of the estimated criminality (45%). There were no significant gender differences in the accuracy of (non)criminality ratings. Finally, women were less confident than men in judging unfamiliar faces, and participants who were more confident in their own judgements had a higher accuracy in ratings of criminals and lower accuracy in ratings of non-criminals, but the effect sizes were small.

Keywords: facial appearance, stereotypes, gender differences, criminality

Introduction

Throughout history the link between physical appearance, especially facial characteristics, behavioural and psychological characteristics of people was of great interest to many researchers. One of these characteristics, that captured special attention of many researchers investigating facial appearance-based inferences for many years, was criminality. For example, in the 19th century Lombroso hypothesized that compared with „normal“ women, female criminals more often have “receding foreheads, over jutting brows, large lower jaws, and prominent cheekbone“ (Zebrowitz, 1997). Even today, researches argue that specific facial features may serve as predictors of propensity for prosocial and antisocial behaviour (e.g. Haselhuhn & Wong, 2012; Stirrat & Perrett, 2012; ten Brinke & Porter, 2012). For example, greater facial width-to-height ratio is hypothesised to add to the impression of person’s aggressiveness and dangerousness (Hehman, Leitner, Deegan, & Gaertner, 2013).

For creating impressions about others, people need very little cognitive effort, very little time (less than 100ms) and minimum information (e.g. a very brief interaction or even just exposure to a photo) (Klatt et al, 2016; Todorov, Olivola, Dotsch, & Mende-Siedlecki, 2015; Todorov, Said, Engell, & Oosterhof, 2008; Valla, Ceci, & Williams, 2011; Willis & Todorov, 2006; Zebrowitz, Voinescu, & Collins, 1996). The usage of those heuristics helps us get around in the social world (Willis & Todorov, 2006), and it seems that some appearance-based trait judgments are quite accurate (e.g. Roney, Hanson, Durante, & Maestripieri, 2006; Shevlin, Walker, Davies, Banyard, & Lewis, 2003).

However, evidence that facial qualities are enough to enable accurate judgement is scarce, and there is even less evidence which appearance qualities are necessary for those judgements to be made (Zebrowitz, 1997). One of the main models that attempts to explain the relationship between individuals’ facial features and the perception of that individual by others is the two-dimensional model which proposes that people have a tendency to assess faces along two fundamental dimensions: trustworthiness and dominance (Todorov, Baron, & Oosterhof, 2008). Moreover, the perception of emotional expressions if influenced by the structural facial features (Marsh, Adams, & Kleck 2005; Neth & Martinez 2009; Oosterhof & Todorov 2008; Sacco & Hugenberg 2009), as well as resemblance to emotional expressions influence social attributions from faces (Montepare & Dobish, 2003; Oosterhof & Todorov 2008; Said, Sebe, & Todorov, 2009; Todorov & Duchaine 2008; Todorov et al., 2015; Zebrowitz, Kikuchi, & Fellous, 2010).

Generally, studies investigating personality judgements found substantial accuracy in assessing trustworthiness from photographs that were presented in a trial-by-trial manner (e.g. Todorov, Baron, & Oosterhof, 2008). Moreover, other studies suggest that face characteristics shown in photographs may also provide additional cues about behavioural tendencies of the target, such as cheating in a Prisoner’s Dilemma game (Verplaetse, Vanneste, & Braeckman, 2007).

People usually relate certain categories of people to stereotypic notions about how they are expected to look, and there are also present stereotypes about criminality, as well as types of faces prone to particular crimes (Bull, 1992; Bull & McAlpine, 1998; Dumas & Testé, 2006; MacLin & Herrera, 2006; Shoemaker, South, & Lowe, 1973). Raters are usually concordant in their estimates of the criminal appearance of faces (Flowe, 2012; Funk, Walker & Todorov, 2017; MacLin & Herrera, 2006), where dominance is referred to as the main factor contributing to the assessment of a person as someone who has committed a criminal offense (Todorov et al., 2008). Moreover, studies confirmed high correlations between criminal appearance, observed untrustworthiness and dominance, as well as greater masculinity of faces (Flowe, 2012; Funk et al., 2017; Porter, ten Brinke, Gustaw, 2010; Ward, Flowe, & Humphries, 2012). When it comes to emotional expression, angry faces are perceived as emotionally more dominant, and if the the eyes and the mouth are relatively close to each other even neutral faces are rated as having an angry appearance (Hess, Blairy, & Kleck, 2000; Knutson 1996; Montepare & Dobish 2003). In addition, unattractiveness, facial maturity and

asymmetry were frequently found to be positively associated with perceived criminality (Berry & Zebrowitz-McArthur, 1988; Bull, 2006; Dumas & Testé, 2006; Todorov, 2008; Zebrowitz et al., 1996; Zebrowitz & McDonald, 1991).

Both perceiver and target characteristics contribute to the accuracy of inference-based impressions (e.g. Ambady, Hallahan, & Rosenthal, 1995). Accuracy is moderated by our knowledge gained from prior experiences, our attitudes and experiences with the people who show particular face-trait correlation, the culture to which we belong (Todorov et al., 2015) and a disposition for particular face-trait correlations and overgeneralized response to facial features (Zebrowitz, 1997). The inner-group bias in recognizing faces was generally confirmed in both genders (e.g. Rehnman & Herlitz, 2006, 2007; Wright & Sladden, 2003). However, some authors found that females perform better of regardless of target's gender (e.g. McBain, Norton, & Chen, 2009; Rehnman & Herlitz, 2007; Shapiro & Penrod, 1986), while other found males are better in recognizing females faces (McKelvie, Standing, Jean, & Law, 1993; Rehnman & Herlitz, 2007). Nevertheless, females were also found to make more errors than males in the recognition task (Shapiro & Penrod, 1986) and making more false positive judgements in criminality ratings for all faces (Hirst et al., 2016). This could be attributed to the females' tendency to overemphasize their probability of being victimized and thus maintaining a high fear of crime (Miller, Rossi & Simpson, 1991) and a higher sensitivity in rating the degree of criminality from facial expressions. Moreover, it was found that females have more difficulty in criminality ratings for a specific type of criminal offenses (Valla et al., 2011) although people's expectations about a criminal perpetrator's physical appearance vary in relation to the type of criminal offense (Dumas & Testé, 2006; Macrae & Shepherd, 1989; Shoemaker et al., 1973; Skorinko & Spellman, 2013; Yarmey, 1993). In addition to the targets' features and participants' characteristics, appearance-based trait judgments also depend on the conditions of the research situation (e.g. the length of exposure, image quality) (Todorov & Porter, 2014; Willis & Todorov, 2006).

Since interpersonal intuition is prone to error, validity of appearance-based inferences has been repeatedly questioned, and research has never conclusively proved an association between facial appearance and participation in criminal activities (e.g. Olivola & Todorov 2010; Zebrowitz, 1997). Negative consequences of criminality-based inferences also contributed to the long-lasting stigma assigned to the field (Gould, 1981). These stereotypes may influence adjudications at all stages of the legal process (Bull & Rumsey, 1988; Shepherd, 1989). People more often remember criminal-looking faces (MacLin & MacLin, 2004) and chose them more often in police line-ups (Flowe & Humphries, 2011; Flowe, Klatt, & Colloff, 2014; McQuiston & Malpass, 2002). Behavioural confirmation model speaks in favour of self-fulfilling prophecy effect - people whose faces induce strong expectations about their dispositional characteristics may be treated as though they indeed possess them (e.g. Snyder, Tanke, & Berscheid, 1977). Thus, if a person charged with an offence has a face that is "representative" of that offence, he/she is more likely to be found guilty than a person who does not have such a face (Macrae & Shepherd, 1989; Shoemaker et al., 1973) regardless of the strength of the prosecution's evidence (Dumas & Testé, 2006). In addition, according to Dangerous Decisions Theory (DDT; Porter & ten Brinke, 2009), intuitive evaluations of trustworthiness are lasting and may strongly direct assimilation and interpretation of the new data and decision about a person. Assessment of credibility and of guilt or innocence could be biased to such a degree that the subsequent judgements are largely irrational (Dumas & Testé, 2006; Kahneman & Tversky, 1982).

Consequently, this study was prompted by the: (a) inconclusiveness of support in favour of the relationship between facial appearance and participation in criminal behaviours; (b) potential negative outcomes of trait inferences of perceived criminality and today's pressure for quick impersonal solutions in detecting potential threat to people's security (Wu & Zang, 2016); (c) inconsistent findings on significant gender differences in face perception, recognition and classification (Megreya, Bindemann, & Havard, 2011); (d) lack of research on association between criminal stereotypes and identification for female suspects and

assessments of a female suspect's guilt (Ward et al., 2012); (e) and even less studies on how well people can assess their own (in)ability to make valuable inferences from faces (Todorov et al., 2015), and how this prospective confidence relates to the accuracy of their judgements.

Study aims and hypothesis

1. To examine participants' ability to differentiate between criminals and non-criminals. Built on previous research (e.g. Johnson, Anderson, Westra, & Suter, 2018; Porter et al., 2008; Valla et al., 2011), it was hypothesised that accuracy of detecting non-criminals will be higher than of detecting criminals, and that the accuracy of detecting both non-criminals and criminals will be greater than the chance.

2. To examine gender differences in competence to distinguish amongst criminals and non-criminals. Previous studies indicated that females were generally more accurate in processing face-specific information (e.g. Rehnman & Herlitz, 2006, 2007; McBain et al., 2009), so it was expected that females will be more accurate in their judgements than males. However, because in this study (non)criminality of only female faces was assessed, and women tend to judge faces of other women as slightly more trustworthy than male faces (Mattrozzi et al., 2015), it was hypothesised that gender differences will be small.

3. To examine the association between the confidence in judging others and accuracy of distinguishing between criminals and non-criminals. Based on the findings from eyewitness identification field it was hypothesised that the association between confidence in judging others and the accuracy of distinguishing between criminals and non-criminals will be small (e.g. Cutler & Penrod, 1989), and that respondents will overestimate their ability (e.g. Brewer & Wells, 2006).

Method

Participants

Data were collected as a part of a larger on-line research , on a convenient sample of 1312 adult internet users. Only data from the participants who fully completed the survey (N=832) were analysed. Participants were mainly young (Mage = 23.95; SDage = 6.76), females (N = 675), with at least a high school diploma (55%). From the analysis answers from the respondents who partially filled survey (N=458) and from those who responded using obvious patterns (e.g. claiming that every photo depicts a (non)criminal) (N = 22) were excluded (see Johnson et al., 2018).

Procedure

Photographs selection (pilot study 1 and 2)

In order to choose the initial set of photographs, we used the following criteria: coloured, forward-facing photographs with adequate lighting of the face, standard ID photo (photos taken by others for ID documents, excluding police mugshots and selfies), Caucasian, female, without scars or other marks on the face (i.e. tattoos, noticeable make-up) (e.g. Funk & Todorov, 2013), diverse in terms of the type of crime they are suspected of (e.g. homicide, fraud, drug trafficking, terrorism, human trafficking), socio-economic status, age, occupation. Criminals' photographs (N = 59) were chosen from Interpol database of wanted criminal suspects (<https://www.interpol.int/notice/search/wanted>) which is openly accessible. The researchers' female friends and acquaintances' photographs were used as non-criminals' photographs (N =

40), after they gave their written consent for using their photographs in the study, and were acquainted with the purpose and aims of the study. To ensure the photograph uniformity, other body parts except face, neck and shoulders, most of the background were removed, and they were adjusted to the same size and scaling (resized to 360 pixels).

The aim of the first pilot study was to assess the quality (e.g. contrast, acceptable face' lightening) of every photography on a 3-point scale (good, average, bad). Photographs were presented online, one by one and sequentially, in randomized order. In each viewing session, the quality of 99 photographs were estimated by independent raters (between 12 and 21). After the first pilot study, only photographs with a good quality were chosen (N = 35) (Table 1a and Table 1b).

Table 1a *Estimated quality of photographs and age of the photographed persons*

	Whole set	Excluded photos	First selection	Final selection
N _{photos}	99	64	35	20
Average age range	18.08 – 67.92	18.08 – 67.92	19.80 – 62.67	21.10 – 62.67
M _{age} (SD _{age})	36.38 (11.58)	37.47 (11.53)	34.40 (11.56)	37.25 (12.32)
% good quality photos	0.26	0.23	0.33	0.31
% average quality photos	0.49	0.47	0.52	0.57
% bad quality photos	0.25	0.30	0.15	0.12

Table 1b *Estimated quality of photographs and age of the photographed persons in the final set*

Category	Characteristics	Criminals		Non-criminals		t(18)	p
		M	SD	M	SD		
Photo quality	good	0.25	0.15	0.36	0.23	1.63	.12
	average	0.61	0.10	0.47	0.22	1.83	.08
	poor	0.17	0.13	0.17	0.25	0.03	.99
	Age	37.35	11.38	37.15	13.82	0.19	.09

The aim of the second pilot study was to reduce the number of stimuli (from N=35 to N=20 photographs with satisfying quality) and to collect additional information about photograph properties. There is always a possibility that accuracy of judgements for the set of photographs (criminal/non-criminal) is a product of specific characteristic(s) of a certain photograph within the set (e.g. Todorov & Porter, 2014). Thus, it was examined whether criminal and non-criminal photographs have pronounced characteristics related to social attributions (e.g. Flowe & Humphries, 2011; Klatt et al., 2016; Langlois et al., 2000; Rule & Ambady, 2008; Zebrowitz & Montepare 1992). Using protocols in paper-pencil format, a small group of university students (between 24 and 39) provided their ratings of sequentially presented photographs on a PowerPoint presentation. They rated every face on several dimensions. They were instructed to make their estimates fast, and to rely on their first impressions. Before this task they saw a sample photo and every dimension was briefly orally described to them to reduce interpretative subjectivity. After estimating persons' age, participants rated persons' facial characteristics (e.g. symmetry, femininity, attractiveness, averageness, baby faceness, emotionality) on a 7-point semantic differential type of scale. After that, participants estimated to what degree a person's face expresses specific emotions (e.g. remorse, sadness, anger, happiness,

guilt), and personality traits and competencies (e.g. neurotic, responsible, evil, competent) on a 7-point scale (ranging from 1 - not at all to 7 – completely). The estimates of characteristics for the initial set of 35 photographs (those with satisfying photo quality) and the characteristics for the final set of 20 photographs, used in the main study by the independent raters are shown in Table 2. The direction and significance of the differences in estimates for criminals and non-criminals were consistent in the initial as well as final set of photographs.

Table 2 Initial comparison of a set of criminal and non-criminal photographs after the first and final selection

Category	Characteristics	First selection (19 criminals – 16 non-criminals)		Final selection (10 criminals – 10 non-criminals)	
		<i>t</i> -test	<i>p</i>	<i>t</i> -test	<i>p</i>
Facial characteristics	symmetric - asymmetric	.83	.41	2.08	.05
	feminine - masculine	1.98	.06	.27	.79
	non-attractive- attractive	1.64	.11	1.19	.25
	average - unusual	.65	.52	.08	.94
	baby-face - mature face	.16	.87	.33	.74
	neutral - emotional	1.67	.10	.38	.71
Emotional expressions	anger	.08	.94	.17	.87
	happiness	.28	.78	.07	.95
	remorse	.05	.96	.59	.56
	sadness	.08	.94	.64	.53
	guilt	.59	.56	.48	.64
Personality traits and competencies	criminal	1.32	.20	2.06	.05
	intelligent	.84	.41	1.12	.28
	trustworthy	.79	.43	1.47	.16
	threatening	.02	.99	.87	.40
	social	.83	.41	1.26	.22
	caring	.97	.34	1.72	.10
	evil	.19	.85	1.19	.25
	responsible	1.16	.26	1.55	.14
	nice	.43	.67	1.32	.21
	aggressive	.78	.44	1.63	.12
	capable	1.14	.26	1.27	.22
	pleasant	.50	.62	1.23	.24
neurotic	1.45	.16	1.60	.13	

In order to further examine whether, and to what extent, the photographs of criminal and non-criminal females provoke different impressions in respondents (see Porter, England, Juodis, ten Brinke, & Wilson, 2008; Valla et al., 2011; Todorov & Porter, 2014) a larger sample of participants - a convenient sample of N=252 students at University of Zagreb (60.7% female; Mage=21.27; SDage=2.152) provided assessment of those photographs in the additional pilot study. The same procedure was used as in the previous pilot study but in order to avoid fatigue, each of the students estimated characteristics for only 10 female photographs (5 depicting a criminal and 5 non-criminal) on paper-pencil format protocols. With this additional analysis it was shown that females who were involved in criminal activity were rated as appearing more criminal, threatening, aggressive, more dominant and less trustworthy than females who did not commit any crime (see Table 3).

Table 3 *Additional comparison of a set of criminal and non-criminal photographs in the final set*

Characteristics	Criminals		Non-criminals		<i>t-test</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
criminality	2.98	1.05	2.61	.99	4.96	.00
trustworthiness	3.09	.82	3.20	.83	2.04	.04
threatening	2.79	.94	2.55	.87	3.45	.00
evil	2.58	.92	2.48	.91	1.73	.08
aggressiveness	2.82	1.00	2.56	.95	3.43	.00
dominance	3.33	1.06	3.10	.99	3.65	.00

Main study

The main study was conducted on-line. In order to mask the motivation behind the study, participants were told they will participate in a study which aims to assess how judgments about ourselves and others are formatted. Every participant was invited either via the mailing list or social network. The main task was to estimate first how much confidence they have in their own judgements' of other people, on a 5-point Likert scale (ranging from 1 - not at all to 5 - completely) ("When I see a person I know with whom I am dealing with"), and then to evaluate females' criminality based on their physical appearance. They were instructed to make their judgments spontaneously and as fast as possible. Before being presented with 20 photographs in a randomized order participants saw the example of viewing and judging task. Each photograph was presented at the screen for 3000 ms. Participants were asked to rate on a 4-point scale (ranging from 1 - not at all to 4 - completely) the degree to which every presented female photograph looks like a criminal. For those photographs which were judged as depicting a criminal, participant had to link the female face with a type of criminal offence chosen from a list (terrorism, fraud, drug trafficking, homicide) (see Valla et al., 2011; Yarmey, 1993). Participants were not familiarized with the number of photographs they would be presented with, nor with the ratio of criminal and non-criminal photographs. After judgments, participants indicated their age and level of education. They had the opportunity for receive feedback on the accuracy of their judgements via e-mail. Ethical Board of the Institute of Social Sciences Ivo Pilar permitted all the aspects of the study.

Statistical analyses

T-tests were used to assess gender differences in the accuracy and confidence of the appearance-based criminality judgements, and zero-order correlations to assess the link between the appearance-based criminality judgements and the confidence of the judgements.

Results

The criminality ratings of photographs, made on a 4-point Likert scale, were recoded into binary criminality ratings: responses 1 and 2 were recorded in non-criminality ratings (0), and responses 3 and 4 into criminality ratings (1). After that, these responses were checked against factual criminality of the person at the photograph and recoded into binary accuracy ratings accordingly (accurate – inaccurate). We opted for this approach for two reasons: 1) we were interested in calculating rates of accurately recognized (non)criminals, since studies based on recognition tasks traditionally use binary scales (i.e. “yes” or “no”) in order to assess participants’ recognition abilities, and 2) we wanted to directly compare the rates of successful (non)criminal recognition to those reported in other studies (i.e. Valla et al., 2011). Accuracy ratings were calculated for the whole sample, and separately for males and females. Moreover, accuracy ratings were calculated for the whole set of photographs, and separately for criminals’ and non-criminals’ photos (Table 4).

Table 4 Accuracy of (non)criminality judgements – average number of correctly classified photographs

Judgements’ accuracy	N_{photos}	M	SD	M_f	SD_f	M_m	SD_m
Non-Criminals	10	6.99	1.72	7.02	1.70	6.78	1.82
Criminals	10	4.47	1.90	4.43	1.87	4.66	1.99
Total	20	11.45	1.97	11.45	1.96	11.45	2.05

Note. *f* – female (N = 675); *m* – male (N = 157)

The accuracy of (non)criminality ratings for all photographs was a little above the chance level, since 57% of all photos was correctly classified (Table 4). The classification of the non-criminals was more accurate (70%) than classification of the criminals (45%) indicating innocence bias among the respondents ($r(832) = .41$; $p < .01$; $t(831) = 23.79$, $p = .000$).

Both female and male participants classified non-criminals more accurately than criminals (Table 4) and there were no significant gender differences in the accuracy of criminality ratings for the whole set of photographs ($t(830) = 2.51$; $p = .973$), nor for criminals’ photographs ($t(830) = 1.39$; $p = .164$) and non-criminals’ photographs ($t(830) = 1.58$; $p = .115$) separately.

Table 5 Hit, false alarm, miss and correct rejection rates for criminal recognition accuracy

	Hit	Miss	False Alarm	Correct Rejection	d'
Non-Criminal	N/A	N/A	.30	.70	0.36
Criminal	.45	.55	N/A	N/A	

Note. d' – sensitivity Index

Judgement accuracy, in terms of discriminative sensitivity (d') which controls for response biases, showed that our participants were not very sensitive ($d' = 0.36$) to detecting criminals (Table 5).

Table 6 *Confidence ratings*

Judgements' confidence	<i>M</i>	<i>SD</i>
Total sample	3.06	0.95
Females	3.02	0.93
Males	3.24	1.05

Note. Nfemale = 675; Nmale = 157

In general, participants were averagely confident in their capability to judge the person based on the first impression (Table 6). However, males were statistically more confident than females in the accuracy of their judgements ($t(830) = 2.59$; $p < .01$).

Table 7 *Correlations between the confidence and the accuracy of (non)criminality judgements*

	Judgements' accuracy		
	Total	Non-Criminals	Criminals
Confidence	-.02	-.11**	.08*

Note. * $p < .05$; ** $p < .01$

Zero-order correlations indicated that participants who were more confident in their own judgements had higher accuracy in ratings of criminals and lower accuracy in ratings of non-criminals, but the effect size of these associations was very small (Table 7).

Table 8 *Accuracy of (non)criminality judgements with regard to extreme scores on confidence ratings (25% of scale results)*

	Judgment accuracy					
	Total		Criminals		Non-criminals	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Lowest 25%	11.31	1.99	4.28	2.14	7.04	1.76
Highest 25%	11.24	1.91	4.57	1.72	6.67	1.68
<i>t</i> -test	.40		1.64		2.28*	

Note. Nlowest 25% = 207; Nhighest 25% = 265; $df = 470$; * $p < .05$; ** $p < .01$

Those respondents who were the least confident in their accuracy of judging other people were more accurate in ratings of non-criminals than those who were most confident in their accuracy of judging other people (Table 8).

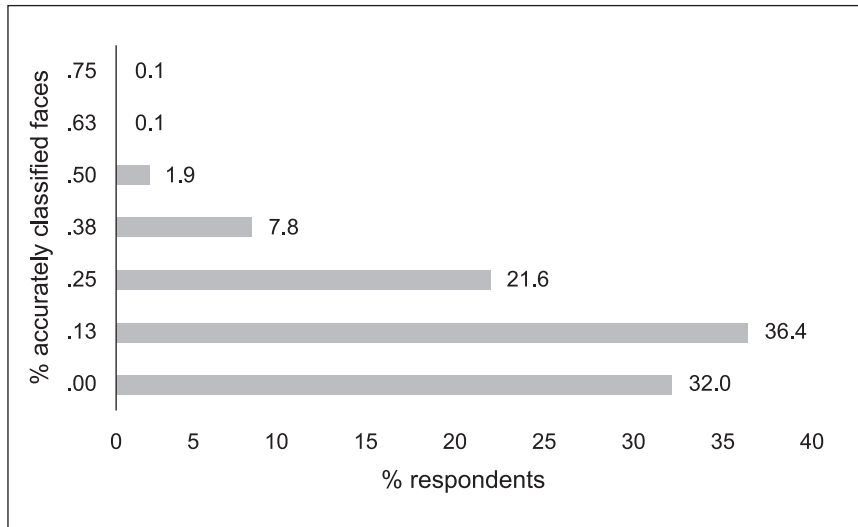


Figure 1 Distribution of participants with regard to the percentage of accurately linked photos to specific crimes

The accuracy of criminals' classification regarding specific crimes was very low (Figure 1). Specifically, 68.4% of participants classified female faces regarding specific crimes below the level of guessing (below 25%).

Discussion

Although there is a prevailing opinion that appearance-based inferences on criminality should be rather easy, and that more and less trustworthy members of society could be easily discriminated by looking at their faces (e.g. Porter et al., 2008), according to most studies, judgement accuracy levels rarely exceeds chance level, especially when it is controlled for other features related to criminality judgements and/or for response bias (Todorov & Porter, 2014). Todorov and Porter (2014) also argued that even above-chance accuracy is "a rather feeble benchmark" and does not provide a lot of information about the validity of face-based social attributions.

Accuracy of inferences about criminality for the whole set of photographs in our study was 57%, which is concurrent with most studies showing that judgement accuracy is either around 50%, or slightly above (Olivola, Sussman, Tsetsos, Kang, & Todorov, 2012; Todorov et al., 2015). However, there are some findings that the accuracy of inferences on a sample of photographs that had been controlled for racial features and attractiveness is lower than 50% (Valla et al., 2011), indicating that the capability to distinguish some characteristics of people on photographs better than chance may have to do more with the photographs' selection rather than with authentic cues of criminality (Todorov et al., 2015).

When it comes to the classification of criminals vs. classification of non-criminals, the results showed that participants were more prone to label the target as a non-criminal since the classification of the criminals was significantly less accurate (45%) than the classification of the non-criminals (70%). This is in concordance with findings obtained by other studies showing that inferences of non-criminals are statistically more accurate than those of criminals (e.g. Johnson et al., 2018; Porter et al., 2008). This could be at least partly attributed to respondents considering the base criminality population rate. Namely, there is approximately 1% to 5% criminals in the general population, and assuming someone is not a criminal would seem to be a more probable outcome. Since the set of stimuli, presented in research such as this (e.g. Johnson et al., 2018; Porter et al., 2008; Valla et al., 2011), has a significantly higher proportion of criminals

(e.g. 50%) than expected in general population, more accurate identification of non-criminals than criminals could be expected. Also, equalizing groups of people by the majority of clues people use to discriminate between those groups, and exposing them to very specific examples of people from the groups does not allow us to conclude that people are unable to discriminate between them. Moreover, these results could be explained by the activation of the “presumed innocence” heuristics, which became activated because people in general believe that other people are “good”, especially when judgments are made in ambiguous circumstances (Johnson et al., 2018; Tamborini, Huang, Mastro, & Nabashi-Nakahara, 2007). However, study sensitivity index for detecting criminals was higher in some previous studies (i.e. Valla et al., 2011, $d' = 0.5$) than in this study ($d' = 0.36$). It is possible that the participants of the former study were directed toward making more criminality judgements with instruction on how many photographs they will see and with the instruction “that some men were convicted of crimes”.

Literature goes in favour of a relatively high degree of agreement in the connection of specific faces with particular offences (Dumas & Testé, 2006; Macrae and Shepherd, 1989; Shoemaker et al., 1973), but studies investigating the accuracy of linking a specific person to a specific crime consistently showed that accuracy is, also, at best on the chance level. For example, some studies indicated that the main effect of the type of crime on inference accuracy is non-significant (e.g. Funk & Todorov, 2013), while in other studies the accuracy of linking face to specific crimes is between 10% and 20% (Valla et al., 2011), similar to the results in this study. Specifically, 68.4% of participants classified faces regarding specific crimes below the chance level, and only 0.1% of respondents correctly matched 75% of persons to crimes they committed. However, when interpreting these results, several things should be acknowledged. Firstly, the accuracy of associating certain faces with specific offences is directly influenced by the level of congruency between target’s face and the specific offence. When asked to describe what they think a criminal looks like, people significantly more frequently report that the typical criminal perpetrator is “male” (Madriz, 1997; O’Connor, 1984; Reed & Reed, 1973), and distinguish between males’ crimes (e.g. violent crimes and drug offenses) and females crimes (e.g. prostitution and shoplifting) (Skorinko & Spellman, 2013). Since female photographs were used in this study, and the crimes they committed were not typically feminine (e.g. murder, drug dealing, terrorism), the respondents’ low accuracy was maybe caused by induced mismatch between the used stimulus and respondents’ criminality stereotypes. However, previous studies also showed that people couldn’t distinguish between types of criminals but are capable of accurate general inferences about criminality (Valla et al., 2011). These findings are in line with the notion that propensity for criminal behaviour is generalizable for most of the crimes and that the person who committed one type of a crime is likely to commit other types of crime as well (Gottfredson & Hirschi, 1994).

Regarding gender differences in ability to distinguish between criminals and non-criminals, our results indicated that female and male participants had a similar tendency of being more accurate in non-criminal classification than in criminal classification. Although some authors found general advantage for female observers in judging faces (e.g. McBain et al., 2009; Rehnman & Herlitz, 2007; Shapiro & Penrod, 1986; Mattarozzi, Todorov, Marzocchi, Vicari, & Russo, 2015), in our study there were no significant gender differences in the accuracy of general criminality ratings for neither criminal photographs, nor for non-criminal photographs. The obtained results could partly be attributed to general expectation of respondents that females less often commit crimes than males. However, neither some previous studies, in which only male photographs were used, confirmed gender differences in the ability to detect criminality (e.g. Johnson et al., 2018; Valla et al., 2011). Mattarozzi et al. (2015, p. 9) suggested that “gender is a factor that should be considered in studies on first impressions” although the obtained effects are rather small, and thus caution is required in interpreting gender effects.

Finally, similarly to previous studies in the field of recognition accuracy in forensic settings (e.g. Cutler & Penrod, 1989; Perfect, Watson, & Wagstaff, 1993), our results indicated that prospective confidence

is not a (strong) predictor of the accuracy of the appearance-based inferences. Although participants who were more confident in their own judgements had higher accuracy in the ratings of criminals, and lower accuracy in the ratings of non-criminals, the effect size of these associations was very small. This finding could be more related to the content of the question asked to estimate the confidence (“When I see a person I know who I am dealing with”) than to the diagnostic value of the prospective confidence for accuracy of appearance-based inferences. In addition, it could be assumed that prospective confidence in an (un)successful task completion is based on the anticipated type of the task and anticipated difficulty of the task. If there is a mismatch between expectation and the actual properties of the task, that could not be judged before its completion, it is not surprising that the prospective confidence is unrealistic and marginally related to the accuracy of the appearance-based inferences (Sporer, 1993). Moreover, as in previous studies, gender affected the confidence judgment, and it was confirmed that women were less confident than men in judging unfamiliar faces (Mattarozzi, et al., 2015).

The present findings should be interpreted in the light of certain study limitations. Firstly, the conclusion that a person’s facial appearance is, or is not, a valid indicator of underlying characteristics, is directly influenced by the photography selection and quality (e.g. Jenkins, White, Van Montfort, & Burton, 2011; Todorov & Porter, 2014). The praxis regarding photograph selection in the previous research on criminality judgements was very different. For example, Valla et al. (2011) based on their photo selection criteria in the first study concluded that results “could not be attributed to differences in attractiveness, race, gender, age, facial hair, hairstyle, or photo quality between these groups.” In the second study, Valla et al. (2011) additionally controlled for happy, sad, angry, surprised, pleasant, and aroused emotional expression of the faces, while Johnson et al. (2018) while studying appearance-based criminality judgements did not control for any features related to trustworthiness. Quite differently, in the Porter’s et al. (2008), participants in the pilot study rated target faces on the following characteristics: attractiveness, baby-facedness, symmetry, kindness, aggression, age, ethnicity, and familiarity. They concluded that two target groups (criminals and non-criminals) did not differ on these pilot ratings, and that criminals were as likely to be judged as trustworthy as they were to be judged untrustworthy. Todorov and Porter (2014) argued that the ability to discriminate mug shots of arrested people from university students’ photographs (Valla et al., 2011), or America’s Most Wanted persons photographs from the Nobel Peace Prize winners’ photographs (Porter et al., 2008), on a better than chance level, may have to do more with the photographs’ selection rather than with the authentic signals of criminality since none of the control photographs in these studies were taken in the context of the police arrest. Regardless of the efforts made in controlling certain target characteristics in experiments, Adams et al. (2012) believe that eventually no one sees a face as neutral, but a face takes on an emotional tone due to particular properties such as race, age, and sex, and Todorov and Porter (2014) showed that even different images of the same individual can result in different social attributions. Moreover, since people seem to have pre-determined stereotypes about what a criminal looks like (e.g. have unkempt or long hair, scars, pockmarks, facial hair, and sharp eyes - MacLin & Herrera, 2006), activation of criminality stereotype also depends on the type of crime each respondent had in mind while making judgements and the gender of the criminal (Flowe, 2012). Furthermore, social attributions from faces are not just a product of facial physical structure, but also (a)typicality of the face, our implicit association of observed face to specific social category, our knowledge, resemblance of observed face to the faces we (dis)like, or to ourself (Todorov & Porter, 2014), so it would be good to include those variables as well in the future research. The second limitation of this study is related to a relatively small set of photographs ($N = 20$) used. Although this attenuated participants’ fatigue while making repetitive judgements, upcoming studies should examine what is an optimal number of stimulus to produce most reliable judgements. In the future studies, retrospective confidence should be measured and related to the accuracy of the appearance-based inferences. It will be interesting to compare retrospective confidence in judgement accuracy separately for

criminal and non-criminal photographs. In addition, prospective studies should try to imitate as much as possible direct personal interaction between the eyewitness and the target to improve results' external validity. Moreover, as the study was conducted online and the process of assessing the photographs was not controlled, there is a possibility that some distractions which influenced the accuracy of the inferences were present. Finally, the participants in our study were mostly female. Hence, replication of the results in more controlled experimental conditions and with more gender-balanced samples would contribute to the findings validity.

Conclusion

Females' facial appearance was not proven to be a valid indicator of their criminal behaviour in this study. Namely, the participants' ability to distinguish between criminals and non-criminals did not exceed significantly the chance level. Moreover, the capability of the majority of participants in relating specific faces to specific crimes was not better than chance. Male and female respondents showed the same level of competence in distinguishing between female criminals and non-criminals, and the confidence in judging others did not exert a significant impact on the appearance-based inferences' accuracy. However, limitations of this study prevent us from reaching a definitive conclusion about people's ability to discriminate between criminals and non-criminals based on their appearance, and this research could be considered only as a starting point in further investigation of this topic.

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13

Predicting Work and Family Conflict Using Personal Values, Work Characteristics and Family Functioning Perceptions from Both Spouses

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Abstract

The aim of this study was to determine the value of different life domains of the individual and his/her spouse in explaining the experience of work disturbing family life (work-to-family conflict) and of the family disturbing work (family-to-work conflict). Four hierarchical regression analyses were performed, differing in the criterion variable (both types of conflict in men and women). Predictor variables were organized in three steps accordingly: 1) individual and spouse personal values (striving for achievement and attitude towards gender roles in marriage); 2) individual and spouse assessments of job characteristics (work control and demands, social support from superiors and colleagues); 3) individual and spouse assessments of characteristics of their common family domain (family competence and conflict, social support from the spouse and other close persons). Variables were measured using self-assessment scales completed by 274 employed, married couples who are parents.

The results showed that all groups of predictors significantly contributed to the explanation of work-family conflicts. Personal values of the male spouse contribute significantly, but become irrelevant for both types of work-family conflict when the work and family environments are included. Job assessments mostly contributed to explaining work-to-family conflict, while family assessments mostly contributed to explaining family-to-work conflict in both spouses. Interesting gender differences in terms of the significance of predictors, especially spouses' work assessments, were found. In general, these variables account for a maximum of 35% of the dependent variables variance, which points out the need to consider other relevant factors in explaining work-family conflicts.

Keywords: work-family conflict, work demands, social support at work and in the family, quality of family functioning, attitudes and strivings of spouses

Introduction

“Conflict between work and family roles (work-family conflict) is, thus, usually defined as the experience of incompatibility of work and family roles, that is, that satisfying the requirements of one domain makes it difficult or even disables satisfying requirements of the other domain” (Greenhaus & Beutell, 1985, pp. 77). There is strong evidence that researchers should view both directions of work-family conflict as two separate constructs: conflict because of the disturbing effect of work on family life (hereinafter referred to as *work-to-family conflict*) and conflict because of disruptive effects of the family on work (hereinafter referred to as *family-to-work conflict*) (Byron, 2005). The determining factors that contribute to the experience of conflicting work and family roles, in an effort to prevent or at least mitigate negative outcomes, is of great importance for researchers. These problems seem especially pronounced in dual-earner families (Obradović & Čudina-Obradović, 2013).

Various theories of (professional) stress such as the Conservation of Resources Model (Hobfoll, 1989), the Job Demands–Control–Support Model (Karasek & Theorell, 1990), and the Social Identity Theory (Rothbard & Edwards, 2003) were applied in the attempts to identify factors contributing to the experience of work-family conflicts. Such attempts resulted in numerous models involving structural, social, and psychological requirements and resources of each domain as the main antecedents of work-family conflict (Carlson & Frone, 2003; Frone, Yardley & Markel, 1997; Hwang & Ramadoss, 2016), with higher requirements and less available resources being related to experiences of greater work-family conflict. Specific domain characteristics are usually shown to be more related to the disturbing effects of the same domain on another domain. Personal coping mechanisms such as social support (Carlson & Perrewé, 1999; Kossek & Perrigino, 2016; Michel, Mitchelson, Pichler & Cullen, 2010), attributes directly related to the individual such as personality traits, role salience, and values (Bruck & Allen, 2003; Knežević, Gregov & Šimunić, 2016; Michel, Mitchelson, Kotrba, LeBreton & Baltes, 2009), and variables related to cultural contexts (Ollier-Malaterre & Foucreault, 2016) are also examined as predictors of work-family conflict. Sociodemographic characteristics such as gender, life stage (age), work experience, level of education, income, religion, nationality, etc., have not proved to be sufficiently predictable in relation to other components of the models and are usually excluded from the analysis (Carlson & Perrewé, 1999).

When it comes to research on employed spouses, approaches integrated into the so-called “Spillover-Crossover Model” (Bakker & Demerouti, 2012) are increasingly being used. In this model, two mechanisms of transfer of well-being, the so-called spillover and crossover processes, are integrated. Spillover processes refer to the processes of intraindividual transfer of stress, affect, and energy from one domain to another domain in an individual’s life. Crossover processes refer to processes of interindividual transmission of stress, affect, and energy. It is used in psychological research to investigate the impact of the work domain (stress) on the family domain (stress) and then the transfer of work-related affects to other members of the household (especially the spouse). According to the assumptions of the Spillover-Crossover model, taking into account other close persons (the spouse) and their perceptions of the family and of their own work domain, and examining the predictive value of such set of variables adds to work-family research. Researchers have examined work stressors and mainly work-to-family conflict of both spouses and their relation to various outcomes (e.g. Obradović & Čudina-Obradović, 2013; Westman, Etzion & Danon, 2001) and included personal characteristics of both spouses along with individual work and/or family characteristics as predictors of work-family conflict (Abeysekera & Gahan 2017; Šimunić, 2015). However, there is no known research including personal characteristics along with the assessment of both work and family domain of both spouses. Furthermore, when including spouses in research, it is common to examine gender specific relations, taking into account a gender role theory perspective (Way, 1991; Zhao, Zhang & Foley, 2017). Since men are still considered to be the main family breadwinner from the traditional viewpoint,

most of the partner's effects research has dealt with the effects of male work-related stress on the women's well-being, while fewer researchers have explored the two-way effects of partner stress (Obradović & Čudina-Obradović, 2013; Park, 2012). The results of such research suggest that women may be more susceptible to the crossover process than men. Westman (2006) states that there are at least three groups of findings that support the claim that women are more likely to receive stress and strain experienced by their husbands: 1) women experience a higher level of stress and are therefore less resistant to coping with the burden and stress of their husbands. This issue is influenced by the accepted idea of men as supporters; 2) Women are more sympathetic to the stresses of their spouses and are therefore more susceptible to the crossover process and 3) Women are more sensitive to the crossover process due to their role as social support providers.

In the aforementioned study on employed spouses in Croatia (Šimunić, 2015) gender role attitudes and striving for achievement of both participants and their spouses were taken into account as antecedents of work-family conflicts, while the other characteristics taken into account were perceptions of work and family characteristics of the individual. The demand-support-control resource was taken into account in choosing work and comparable family predictors, while also taking into account suggestions to include more sources of social support (Selvarajan, Cloninger & Singh, 2013): 1) work control and demands and support from the supervisor and work colleagues as work characteristics and 2) family competence and conflict in the family along with support from the spouse and other close persons as family characteristics. Gender role attitudes and striving for achievement, on the other hand, were variables that were shown to be interesting in the context of research including similar variables on spouses in Croatia and Southern Herzegovina (Gjurić, Šimunić & Gregov, 2014; Pandža, 2010; Šimunić, Gregov & Proroković, 2011). Men were shown to be on average more traditional in their attitudes towards gender roles and reported higher levels of striving for achievement than women and both variables were related to greater work-to-family and family-to-work conflict in both spouses. People with traditional gender role attitudes support the view that women should be primary caregivers and take care of the household, while men should be mainly dedicated to the work domain, which seems to be a 'negative' attitude when both spouses are employed full-time, implying lower flexibility in using different coping strategies (Cohen, 2009). Egalitarian gender role attitudes support the view that men and women should have an equal possibility to dedicate themselves to any life role. Striving for achievement measured in these studies referred to striving towards power, competition, and success (O'Neil, Helms, Gable, David & Wrightsman, 1986), which seems to be related to conflicting relationships with others (the correlation with family functioning variables was positive). The results of the research of Šimunić (2015) showed that these personal values had no significant indirect relation with work-to-family conflict in men, while both higher levels of striving for achievement and traditionality of the gender role attitudes of men significantly indirectly predicted their own perception of greater family-to-work conflict through the decrease of perceived social support received from their wife and the increase of family conflict. Greater traditionality of husbands indirectly predicted higher levels of both conflicts through a decrease in the perceived level of support they receive from husbands, but their own characteristics had no predictive value in the examined models. This points to a greater sensitivity of women to partner effects (Šimunić, Pandža & Gregov, 2017; Westman, 2006). The results obtained generally confirmed assumptions of gender role theories and the results of previous research on gender differences in the significance of the role of social support for women and a greater susceptibility of women and sensitivity of women to the needs of their partner in comparison to men.

Current research builds on the study of Šimunić (2015) in including spouses' assessment of work and family characteristics in predicting work-to-family and family-to-work conflict. Therefore, the aim of this study was to determine the value of different life domains of an individual and his/her spouse in explaining work-to-family and family-to-work conflict in men and women. Taking into account what was pre-

viously mentioned, work-family conflict is here viewed as a strain due to various personal, work, and family characteristics that contribute to the perception of disruption of work and family roles: higher levels of traditionality of attitudes on gender roles in marriage, of striving for achievement, psychological demands of work (lower control and higher work demands), lower family functioning quality (lower competence and greater conflict in family), and lower levels of social support at work and in the family (Hypothesis 1). It was also assumed that the assessment of the individual's work characteristics will explain most of the variation of work-to-family conflict of the individual, and the assessed characteristics of family life most of the variation of family-to-work conflict (Hypothesis 2). An additional assumption was that social support variables and partner variables will be more important predictors of work-to-family and family-to-work conflict in women in comparison to men, while work variables will be more important for men (Hypothesis 3). The order of variable inclusion was directed by the perspective that spouses, with their personal values and expectations (and reactions) enter the work and family domain (Katz i Kahn, 1976), with work being the domain that is separate and more structured with less flexible boundaries and family being the common domain where the spouses interact and can, among other, deal with work-family issues.

Material and methods

Participants

The research was conducted on a convenience sample of 276 employed married partners (276 men and 276 women), with at least 6 months length of service at the same full-time job. The participants were from various parts of Croatia with the majority being from Zadar County. They were from 24 to 63 years old ($M=41$; $SD=8$), and had at least one child living with them. The majority of households had 4 members on average (2 children), the youngest child being 8-9 years old and the oldest child 11-12 years old (on average), and a total monthly income of 8,001 to 10,000 kunas. The participants were very heterogeneous according to their workplaces, including hairdressers, machinists, car mechanics, drivers, caterers, educators, police officers, electrical engineers, economists, doctors, psychologists, lawyers, etc. Most participants were of middle and higher level education. Men had more years of total work experience ($Mm=17.3$; $SDm=8.11$; $Mf=14.2$; $SDf=8.14$; $F(1/718)=24.99$; $p=.000$) than women.

Measuring instruments

A set of questions on sociodemographic data was applied at the beginning of the questionnaire, where participants specified their gender, age, level of education, workplace, years of work experience, number and age of children in the household and household income ranges.

Before describing the following measurement instruments, it must be noted that the scores on total or subscales were made on the basis of the obtained factor structures of the Croatian validations (references to them are stated in each following section for each instrument) and on the basis of the research questions. The factor structure of each scale was also checked and verified for that data.

The scale of egalitarianism of attitudes on gender roles (in marriage and the family) (Šimunić, 2015) – 15 items to assess the attitudes of participants on the appropriate characteristics and behaviours of men and women within the family, who, which and how much responsibility they should take and have, who should be making choices, and how much they should be dedicated to their work and family roles. An egalitarian attitude would reflect the belief that men and women should be equally involved in work and family roles and make decisions together, while a traditional (less egalitarian) attitude reflects the belief

that men should be more involved in work roles and be the main decision maker in the family, while women should be responsible of the household and childcare. Participants expressed their level of agreement with each item on a 6-point scale (1-*strongly disagree*; 6-*strongly agree*). The reliability in terms of the Cronbach alpha coefficient was .84 and the average inter-item correlation .28. An example of the items is: 'The husband should decide on how to spend extra money.' A higher score on this scale reflects a more egalitarian (less traditional) attitude on gender roles in marriage.

Striving for Achievement Scale (Nikolić, Pavela & Šimić, 2014; O'Neil et al., 1986; subscale *Success, Power, Competition*) – 11 items including striving for success (constant concern for personal achievement, competence, failure, career progress, and well-being), for power (maintaining authority, dominance, and influence over others) and competitiveness (competition and comparison with others in order to get something or establish superiority in a particular situation). An exemplary item is: "It is important that I'm smarter/stronger than other men (version for men)/women (version for women)." Participants gave their answers on a 5-point scale (1-*strongly disagree*; 5-*strongly agree*). The Cronbach alpha coefficient on this sample was .87 and the average inter-item correlation .39. A higher result on the scale reflects a higher level of striving for achievement.

The scale of psychological demands and control at work (Gregov, Šimunić & Nikolić, 2012; Šimunić, 2015) – 12 items based on the Karasek concepts of work demands and control, including autonomy/control at work, role conflict, role ambiguity, and work overload (Karasek et al., 1998). Participants expressed their agreement with items on a 7-point scale (1-*strongly disagree*; 7-*strongly agree*). 8 items measure Control at work. An example item is: "I know exactly what tasks and responsibilities my job includes" and the Cronbach alpha of this subscale was .84 (average inter-item correlation .28). 4 items measure Work demands, for example, "My job involves a too large degree of responsibility", with a .74 Cronbach alpha (average inter-item correlation .44). Higher results on the subscales reflect a higher level of control at work and higher work demands.

The Quality of family functioning scale (Šimunić, Gregov & Pupić-Bakrač, 2010; Beavers & Hampson, 1990; *Self-Report Family Inventory-II*) - 33 items measuring the perception of family health/competencies, cohesion, conflict, leadership, and emotional expressiveness. The (dis)agreement with each item was reported on a 7-point scale (1- *strongly disagree*; 7-*strongly agree*). The items are organized into two subscales: Family Competence (25 items) and Family Conflict (8 items). Examples of items are: "My family usually functions well when we are together" for Competence and "In my family, when things go wrong, we blame each other" for Conflict. The Cronbach alpha coefficient for the Competence subscale was .95 while it was .86 for the Conflict subscale. The average inter-item correlations are .47 and .45. Higher results on the subscales reflect a higher level of perceived family competence and lower level of family conflict.

Scale of social support at work and in the family (Šimunić, Gregov & Proroković, 2016) containing four 9-item subscales measuring instrumental and emotional social support for the work and family roles from 1) the supervisor, 2) colleagues, 3) spouse, and 4) other family members and close people. Participants expressed their agreement with each item on a 7-point scale (1-*strongly disagree*; 7-*strongly agree*). An example of an item measuring social support at work is "My superior/colleagues recognize(s) when I do a good job," while an example for items measuring social support in the family is "I can talk about everything with my spouse/other family members and close people. The Cronbach alpha coefficients ranged from .79 to .86, while the average inter-item correlations ranged from .41 and .43. Higher results on these scales reflect a higher level of perceived social support from the four sources.

The Work-family Conflict Scale (Šimunić, Proroković & Ivanov, 2014; Netemeyer, Boles & McMurrinan, 1996) - two sets of 6 items (total of 12 items) differing only in the direction of work-family impact. They measure 1) the disturbing impact of work on family roles (work-to-family conflict) and 2) the disturbing impact of family on work (family-to-work conflict) taking into account limited time and fatigue as sourc-

es of conflict. Participants expressed their agreement with items on a 7-point scale (1-*strongly disagree*; 7-*strongly agree*). Sample items are “Because of the time required for my job I do not have enough time to participate in family activities” for work-to-family conflict and “Because of the time required for family activities I often have to delay and modify work activities” for family-to-work conflict. The Cronbach alpha coefficient for the Work-to-family conflict subscale is .79 and .81 for the Family-to-work subscale, while the average inter-item correlations are .39 and .57. A higher result on the subscales reflects a greater level of both conflicts perceived.

Procedure

The research was conducted with the help of fellow psychologists and graduate students of psychology from various cities and towns in Croatia. Pairs of identical questionnaires were distributed in various work organizations to male and female employees working at the same workplace for at least six months, with an employed spouse (who would fill in the second questionnaire) and at least one child in the household. A part of the sample of participants satisfying these conditions was recruited through personal acquaintances. The participating spouses were warned that they must fill out the questionnaires individually, without an insight in each other’s answers. Furthermore, they were asked to use a common code and return the questionnaires in sealed envelopes. Approximately 800 pairs of questionnaires were distributed. The collection was completed with the data from a total of 358 employed spouses, leading to 276 couples after excluding the sets of questionnaires that were not completely filled out by both spouses.

Results

Before conducting correlation and regression analyses, indexes of the distribution shape (skewness and kurtosis) and machalobis distances were checked. The values inspected were not problematic in allowing the conduction of the planned analyses. However, the results indicated higher levels of family competence and conflict, social support of the spouse and other close persons, and low levels of family-to-work conflict. The linearity of the relationships between variables was determined by inspection of scatterplots. Basic descriptive statistics and Pearson coefficients of correlation between all the variables are shown in Table 1.

Table 1 Bivariate Pearson coefficients of correlation between all examined variables and basic descriptive parameters (N=276)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	M	SD
1. m-Striv.f.achievement	-																							2.72	0.75
2. m-Egal.gend.rol.att.	-.24	-																						4.45	0.76
3. f-Striv.f.achievement	.48	-.19	-																					2.57	0.74
4. f-Egal.gend.rol.att.	-.12	.48	-.09	-																				4.88	0.62
5. m-Work control	-.07	.11	-.03	.01	-																			5.10	1.00
6. m-Work demands	.02	.07	.03	.02	-.13	-																		4.80	1.35
7. m-Soc.supv.supervisor	-.13	.24	-.04	.06	.45	-.16	-																	5.00	1.16
8. m-Soc.supv.colleagues	-.03	.21	-.03	.14	.30	-.03	.45	-																5.30	0.99
9. f-Work control	-.15	.10	-.13	.03	.13	.06	.17	.17	-															5.18	1.00
10. f-Work demands	-.03	.04	.02	-.07	.04	.25	-.07	-.11	-.26	-														4.51	1.34
11. f-Soc.supv.supervisor	-.18	.27	-.16	.18	.08	.17	.27	.21	.57	-.16	-													4.99	1.27
12. f-Soc.supv.colleagues	-.10	.14	-.12	.11	.01	.05	.07	.24	.26	-.18	.36	-												5.36	0.99
13. m-Family competence	-.24	.49	-.02	.18	.29	.11	.35	.31	.14	.14	.20	.16	-											5.88	0.90
14. m-Family conflict	-.24	.40	-.11	.09	.26	.08	.28	.26	.12	.14	.10	.08	.75	-										5.66	1.13
15. m-Soc.supv.spouse	-.21	.46	-.06	.22	.29	.07	.31	.36	.19	.10	.24	.17	.72	.65	-									5.91	0.92
16. m-Soc.supv.other	-.25	.35	-.12	.16	.27	.03	.38	.34	.20	-.00	.27	.18	.54	.43	.55	-								5.37	1.06
17. f-Family competence	-.20	.36	-.18	.22	.14	.18	.23	.23	.25	.08	.31	.28	.68	.53	.59	.37	-							5.86	0.88
18. f-Family conflict	-.20	.28	-.21	.13	.09	.14	.22	.16	.24	.07	.24	.19	.53	.60	.45	.32	.75	-						5.64	1.11
19. f-Soc.supv.spouse	-.18	.38	-.19	.15	.15	.17	.23	.27	.32	-.00	.34	.24	.49	.39	.49	.33	.69	.60	-					5.76	1.06
20. f-Soc.supv.other	-.24	.30	-.31	.14	.11	.12	.25	.25	.32	.02	.38	.39	.34	.25	.27	.50	.43	.40	.53	-				5.41	1.08
21. m-WaF conflict	.15	-.16	.11	-.02	-.42	.38	-.35	-.21	-.05	.12	.07	-.11	-.21	-.31	-.25	-.15	-.15	-.17	-.11	-.03	-			3.36	1.24
22. m-FaW conflict	.20	-.18	.06	-.12	-.33	.13	-.26	-.28	-.17	.04	-.09	-.13	-.37	-.44	-.49	-.38	-.30	-.26	-.20	-.18	.30	-		1.93	1.04
23. f-WaF conflict	.13	-.18	.16	-.08	-.13	-.01	-.10	-.19	-.45	.27	-.43	-.28	-.18	-.21	-.21	-.28	-.21	-.19	-.31	-.23	.21	.13	-	3.26	1.15
24. f-FaW conflict	.17	-.26	.19	-.15	-.15	-.04	-.16	-.25	-.28	.04	-.23	-.19	-.22	-.24	-.28	-.22	-.32	-.31	-.40	-.29	.13	.32	.32	1.96	1.07

Note: Bold correlations - $p < .05$; Prefix m- assessment of husbands; Prefix f – assessments of wives

To determine the value of different life domains of the individual and his/her spouse in predicting conflict due to work-to-family and family-to-work conflict in male and female spouses, four hierarchical regression analyses differing in the criterion variable were performed: 1) work-to-family and 2) family-to-work conflict in men; 3) work-to-family and 4) family-to-work conflict in women. Predictor variables were organized in three steps accordingly: 1) individual and spouse estimates of their own personal values (striving for achievement and attitude towards gender roles in marriage); 2) individual and spouse assessments of job characteristics (work control and difficulty, social support from superior(s) and colleagues); 3) individual and spouse assessment of characteristics of their common family domain (family competence and conflict, social support from the spouse and other close persons). The standardized regression coefficient beta (β) was used as an indicator of the contribution of individual predictors to the explanation of the total criterion variance, and the coefficient of multiple determination (R^2) and the changes in the values of the multiple determination coefficients in subsequent steps (ΔR^2) were used as indicators of the contributions of each group of predictors. Although analyses of principal components confirmed such categorization of the predictors, it should be noted that the social support variables had significant saturations ($>.35$) on the component in line with this categorization and another component distinguishing them from the other categories. Thus, it should be taken into account that the order of variable insertion could have influenced the predictive values of variable categories. It should also be mentioned that parallel analyses including control variables (age, educational level, household income, number and the age of children, etc.) were conducted and the results were without differences. Therefore, due to brevity and clarity, the control variables were excluded from the presented analyses. The results of the four hierarchical regression analyses are presented in Table 2, showing that all groups of predictors significantly contributed to the explanation of work-family conflicts.

Table 2 Results of 4 hierarchical regression analyses with Work-to-Family and Family-to-Work conflict in men and women as criterions (N=276)

Predictors	β- criterion: W→F conflict Men			β- criterion: W→F conflict Women			β- criterion: F→W conflict Men			β- criterion: F→W conflict Women		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
1. Personal values												
m-Striv.f.achievement	.09	-.12*	-.08	.06	.05	.02	-.02	.17**	.15*	.08	.07	.05
m-Egal.gend.rol.att.	.04	.04	-.08	.10	-.09	-.02	-.11	-.06	.07	-.19**	-.13*	-.08
f-Striv.f.achievement	.06	.04	.04	-.00	.06	.07	-.04	-.04	-.03	.10	.09	.05
f-Egal.gend.rol.att.	.04	.04	.03	-.00	.04	.02	-.05	-.06	-.06	-.04	-.04	-.04
m-Work control		-.28**	-.26**		-.09	-.06		-.21**	-.14**		-.06	-.05
m-Work demands		.26**	.27**		-.00	.02		.09	.11*		-.02	.01
m-Soc.supp.supervisor		-.15**	-.15*		.09	.12		-.05	.00		.00	.02
m-Soc.supp.colleagues		-.03	-.02		-.06	-.02		-.13*	-.05		-.13*	-.11
f-Work control		-.03	-.02		-.23**	-.21**		-.11	-.07		-.19**	-.14*
f-Work demands		.05	.07		.16**	.16**		-.02	.04		-.03	-.01
f-Soc.supp.supervisor		.19**	.17**		-.19**	-.20**		.08	.07		.01	.02
f-Soc.supp.colleagues		-.12*	-.13*		-.09	-.10		-.07	-.05		-.07	-.04
m-Soc.supp.spouse			-.06			.05			-.27**			-.04
m-Soc.supp.other			.05			-.16*			-.12			-.01
m-Family competence			.09			.04			.10			.11
m-Family conflict			-.18*			-.18*			-.23**			-.04
f-Soc.supp.spouse			.00			-.15*			.06			-.20**
f-Soc.supp.other			.08			.09			.00			-.02
f-Family competence			-.04			.03			-.06			-.01
f-Family conflict			-.06			.06			.01			-.08
R^2	.04*	.34**	.38**	.05**	.30**	.34**	.06**	.20**	.35**	.08**	.17**	.23**
ΔR^2		.30**	.04**		.25**	.05*		.14**	.15**		.09**	.06*

Note: * $p < .05$; ** $p < .01$; Prefix m- assessment of husbands; Prefix f - assessments of wives

Overall, these variables explained 38% of the variance of *work-to-family conflict* in men and 32% in women. The largest percentage of variance was explained by the characteristics of the spouses' work assessments (30% for men, 25% for women), then family characteristics (4% for men, 5% for women) and personal values (4% for men, 5% for women). In the final step of the analysis, significant individual predictors of higher levels of work-to-family conflict in both men and women (as in the previous steps) were: lower levels of work control (men: $\beta=-26, p<.01$; women: $\beta=-21, p<.01$), higher work demands (men: $\beta=.27, p<.01$; women: $\beta=.16, p<.01$), lower levels of social support by the superior at their own job (men: $\beta=-15, p<.05$; women: $\beta=-20, p<.05$), and higher levels of family conflict perceived by the male spouse (men: $\beta=-.19, p<.05$; women: $\beta=-.18; p<.05$). For men, lower levels of social support the wife receives (perceives) by work colleagues ($\beta=-.12; p<.05$) and, interestingly, higher levels of social support she receives (perceives) by her superior ($\beta=.18; p<.01$) were also significant individual predictors of greater work-to-family conflict, while for women lower levels of the social support she perceives from her husband ($\beta=-.16; p<.05$) and lower levels of social support from other family members and close persons estimated by her husband ($\beta=-.16; p<.05$) were additional significant predictors. For both spouses, higher traditionality of the male spouse was a significant individual predictor of greater work-to-family conflict in the first step. For women, it becomes insignificant in the second step, after entering assessments of the work domain for women, while it becomes insignificant in the last step for men, after including family assessment.

When it comes to *family-to-work conflict* the situation is quite different. The total set of predictors explained 35% of the variance in men and only 23% of the variance in women. The personal values of the spouses in the first step of the analysis explained 6% of the variance for men and 8% of the variance for women, work characteristics explain an additional 14% of the variance in the second step for men and yet 9% for women, and in the last step family characteristics an additional 15% of the variance for men and only 6% for women. The only mutual significant individual predictor of higher family-to-work conflict in men and women in the final step was lower control at the individual's work (men: $\beta=-.14; p<.01$; women: $\beta=-.14; p<.05$). Another mutual predictor of higher family-to-work conflict was lower perceived social support by work colleagues of the male spouse in the second step (men and women: $\beta=-.13; p<.05$) which becomes insignificant when including family characteristics. For men, other individual significant predictors of higher levels of family-to-work conflict were: higher work demands (which was not significant in previous steps: $\beta=.11; p<.05$), lower levels of social support from his wife ($\beta=-.27; p<.01$), and higher levels of family conflict estimated by him ($\beta=-.23; p<.01$). In the previous steps, his higher striving for achievement was a significant predictor ($\beta=.17; p<.01$ in the first step to $\beta=.15; p<.05$ in the third step) but becomes insignificant after introducing family characteristics in the last step. The only other significant individual predictor in the last step in women was a lower estimated level of social support from the husband ($\beta=-.20; p<.01$). A more traditional attitude of the husband on gender roles in marriage was a significant predictor in the first ($\beta=-.19; p<.01$) and in the second step ($\beta=-.13; p<.05$), while becoming insignificant in the third, after introducing family assessments. When viewing the predictive power of individual variables it could be said that family-to-work conflict is related more to family characteristics and personal values than work-to-family conflict is, while work-to-family conflict is predicted mostly by work characteristics, especially in men.

Discussion

Hierarchical regression analyses were conducted to examine how different groups of variables contribute to the explanation of work-to-family and family-to-work conflict in men and women. The regression models included assessments of some personal values and characteristics of the work and family domains of both spouses, with the assumption of so-called crossover effects, i.e. the transfer of stress and strain of one spouse affecting the level of stress and strain of the other spouse. Consequently, work-family conflicts were assumed to represent strain due to various personal, work, and family characteristics contributing to the perception of disruption of work and family roles: higher levels of traditional attitudes on gender roles, of striving for achievement, of psychological demands of work, lower family functioning quality and lower levels of social support for work and family.

The results of research in our country (Gregov et al., 2010; Gjurić et al., 2014; Šimunić et al., 2017; Šimunić et al., 2011) have shown so far that attitudes on gender roles and striving for achievement, to a greater or lesser extent, correlate with work-to-family and family-to-work conflict in men and women. It was therefore assumed that these characteristics of both spouses would significantly contribute to explaining the variance of such conflict, which was confirmed in all cases. However, after the introduction of other variables, none of these variables remain a significant individual predictor, implying a possible mediation effect of work and family characteristics in the relation between personal values and work-family conflict.

According to the generally accepted integrative model of work-family conflict (Frone et al., 1997) and the results of numerous studies (e.g. Himali, 2017; Michel, Kotrba, Mitchelson, Clark & Baltes, 2011), it was assumed that the assessment of the individual's work characteristics would explain most of the variation of work-to-family conflict of the individual, and the assessed characteristics of family life most of the variation of family-to-work conflict. Most of the variation of work-to-family conflict in women and men was undoubtedly explained by the characteristics of their own work. For family-to-work conflict the situation is slightly different when considering relative contributions to explaining the criterion variance after entering family characteristics in the last step. But since the most important individual predictor was social support from the spouse for both men and women in the final step, and, in men, another important predictor was the male spouses' perception of family conflicts, the hypothesis is considered to be confirmed. In women, the gender role attitude of the spouse was a significant predictor in the first two steps and if the characteristics of the spouse are also viewed as a characteristic of the family domain, this could also be in line with this part of the hypothesis.

With regard to the Spillover-Crossover model (Bakker & Demerouti, 2012) it was assumed that the characteristics of the partner's work domain (estimated by the partner) would contribute to explaining work-family conflicts in men and women, but this is only confirmed when it comes to work-to-family conflict in men, and before introducing family characteristics when it comes to family-to-work conflict in women. More about this will be said in the next paragraphs.

Considering the individual significant predictors in the last step of the analysis, it can be said that a higher level of perceived *work-to-family conflict in men* is predicted by higher levels of perceived psychological demands of their work, i.e. lower levels of work control and higher levels of work demands, lower levels of perceived social support from the superior and a higher level of family conflict assessed by him. This is in line with the demand-control-support model (Karasek & Theorell, 1990) postulating that the perception of work stress will be greater with the perception of lower control and support along with increased work demands, and increased work stress can take away the time and energy needed for quality participation in family activities (Greenhaus & Beutell, 1985). The experience of work disturbing family life is higher the more traditional men are in their gender role views, possibly because they justify it more (Zhao et al., 2019) or are less flexible when coping with such disturbance (Cohen, 2009). This becomes irrelevant when taking

family support and functioning into account. If an individual is experiencing a higher level of family conflict (family stressor), the experience of disruption of family life can be more intense, or it could be that precisely because of the family conflict that arises due to work one can perceive an increased level of disruption. It is not excluded here that the relationship is reciprocal. Perhaps the increased experience of interference of work with family life makes one start to experience work as more stressful and to have a greater need for support at work, which may seem insufficient during such situations. Moreover, if the disturbance of family life by work generates family conflict (e.g. because of unfulfilled expectations of other family members), men may assess the work domain even more negatively.

An interesting finding of this study is that a higher level of work-to-family conflict in men was also predicted by a lower level of their wife's perceptions of social support from their colleagues and a higher level of support from the superior at the wife's job. Although this seems illogical, since lower levels of social support at work are considered a predictor of higher levels of this conflict (Frone et al., 1997), an explanation for this may be found in the family situation. If a lower level of social support by the superior of men is a predictor of higher work-to-family conflict (as was obtained), due to increased family disturbances and less chance for the husband to engage in family activities (as evidenced by the significant correlation of higher levels of work-to-family conflict in men and a lower level of social support their wife receives from them) it is likely that their wife reduces engagement at work, with the support of her superior, to dedicate herself to the family. In doing so, she may perceive less support and understanding from her colleagues. However, to determine the pre-supposed causal relationships, one should carry out a research with an experimental and/or longitudinal design.

A higher level of perceived *work-to-family conflict in women* was shown to be predicted with a lower level of job control, a higher level of work demands, and a lower level of perceived social support from the superior. Such results can be explained in the same manner as previously in men. When considering family characteristics, work-to-family conflict in women was predicted by a lower level of perceived social support from the husband, and the husband's perceptions of lower levels of social support from other family members and close persons and of higher levels of family conflict. Increased work stress and experience of work-to-family conflict may be enhanced if at the same time a woman perceives a lack of support from her spouse, and thus experiences increased responsibility for family obligations and activities. Moreover, a positive correlation between social support from the husband and the supervisor with work control could mean that the fact that there is such support increases women's perceptions of workplace control. Furthermore, if the husband perceives poor family communication and interactions, he may be unwilling to participate in family activities. Accordingly, there is a positive correlation between women's perceptions of social support from the husband and his perceptions of the quality of family functioning. On the other hand, it is possible that greater disruption of family life due to women's work leads to an increased need for social support from other family members and close persons, since the husband is also employed or does not manage to handle certain obligations in the family. If such support is lacking, it is very likely that more family demands will not be met, which is likely to further increase a woman's sense of responsibility for the family.

All of the above could lead to family conflict and increase personal needs for additional support from other people. It should also be taken into account that all these assessments are in a significant, positive, and more than moderate correlation between men and women, so it is not excluded that the same assessment in women is an essential determinant of perceptions of the disruptive effects of work on the family in women. Personal values of the spouses should not be ignored, since they were a significant group of predictors in the first step, before introducing work assessment, with higher traditionality of the husband's gender role attitudes being a significant predictor of a higher work-to-family conflict. This could also be explained by such men justifying the disturbance of family life by their work roles, making women look for more support at her job to meet higher family demands. Striving for achievement in women somewhat stands out as being

related to higher work-to-family conflict in women. This trait implies increased investment in employment in terms of the importance of running a successful family life along with a successful business life, which takes away time and availability for the needs of the family (Carlson & Frone, 2003).

When it comes to *family-to-work conflict in men*, it was significantly predicted by lower social support from the wife and greater family conflict (assessed by men). Disagreement with the spouse and family tensions and conflicts may significantly contribute to the perception of a higher level of family-to-work conflict (Michel et al., 2011), and may also be the result of less social support from spouses (Carlson & Perrewé, 1999). Conflicts and the lack of support from their wives could be a psychological strain while the man is at work. Thus, the resources or capacities needed to successfully perform work tasks are reduced. Lower work control and greater work demands also proved to be significant predictors, which may be the result of interruptions at the job due to family life, or perhaps the insight that the job 'suffers' leads to the perception of a higher level of family-to-work conflict.

The results also point to a possible mediating role of family characteristics (social support and the quality of family functioning) in the relationship between striving for achievement and the perception of family-to-work conflict. Men and women with greater striving for achievement have more pronounced negative attitudes and seek less assistance from other people (Good, Robertson, Fitzgerald, Stevens, & Bartels, 1996), express hostility and dominance (Mahalik, 2000), hostility towards and stereotyping of women (Rando, Rogers & Brittan-Powell, 1998), etc., which likely affects the level of family support and the quality of family functioning, and these aspects ultimately contribute to an increase in family-to-work conflict. The results also point to a possible mediating role of work demands and family characteristics in the relationship between the social support from colleagues and family-to-work conflict. An employee may, for example, ask colleagues to change shifts or help perform work tasks in order to be able to leave earlier and attend an important family event or obligation. If there is an absence of such support from colleagues or the colleagues generally do not show understanding of family affairs, problems in the family domain and an experience of greater work demands may arise, which ultimately increases the perception of job interference due to family responsibilities and stress. The latter also applies to a wife's experience of family-to-work conflict.

In women, lower levels of social support from the husband were the most important predictor of greater *family-to-work conflict*. This confirms the results of previous research that point to the importance of social support in dealing with stress in women, who use support more appropriately and frequently when available (Tomova, von Dawans, Heinrichs, Silani & Lamm, 2014; Matijaš, Merkaš & Brdovčak, 2018). The understanding and support of her husband can be used to reduce household obligations or can be relied on when it is necessary, for example, to stay longer at work and not be distracted by phone calls or otherwise while at work. A husband who has a more egalitarian attitude will feel greater relative responsibility for family issues and will have more understanding of his wife's work issues and will value her work more. This may be the reason the attitudes of the husband pointed out as one of the predictors in the previous steps of the analysis. However, it seems to be very important for a man with a more egalitarian attitude on gender roles, who is more likely to seek such support, has the support of his colleagues to be able to provide support for his wife and be available for the family. Moreover, the perception of greater control at work in women is a significant predictor of a lower level of family-to-work conflict, which is understandable, since a person with greater control at work (greater autonomy or freedom to decide on the type, quantity and duration of work tasks) has more resources available to deal with work issues (Kossek & Perrigino, 2016), and also for family issues, for example, through more flexible working hours. On the other hand, when a woman's family interferes with her work, she may lose a sense of control over work (for example, when calls and family requests are excessive) and the sense of responsibility for the family domain may make her start losing the sense of being in control over situations in the work domain. Consideration should also be given to the possible reciprocity of the relationship between social support from the spouse and family-to-work

conflict. Namely, a woman who has the feeling that her family acts disruptive to work may also estimate that she does not have enough support from her husband. In addition, given the high correlations between the aspects of family functioning and the social support from the husband, which could also thus be viewed as one of the aspects of family functioning, it is not excluded that the quality of family functioning generally contributes to the perception of family-to-work conflict in women.

Support from the spouse and job control are significant predictors of both work-to-family and family-to-work conflict in women, showing that job control could be a significant coping resource to reduce work-family conflict for female employees (Hwang & Ramadoss, 2017). Social support was important in explaining work-family conflicts for men also, especially the support from the wife for family-to-work conflict, and even the support their wife receives at work was important for work-to-family conflict. However, work demands were relatively more important than supervisor support in explaining work-to-family conflict (whereas supervisor support was more predictive for such conflict among women) and, contrary to women, had predictive power in explaining family-to-work conflict. What was also gender specific, was the relationship of work-family conflict in women with the personal values of their spouse. It seems that the relatively more egalitarian women in this sample are more vulnerable to their partner values, especially their attitude on gender roles in marriage. This is thought to be the result of gender-specific socialization expectations and experiences. Women's, that is, the feminine gender role allows and encourages the expression of dependence on others, while the masculine gender role places emphasis on strength and individuality (Obradović & Čudina-Obradović, 2001). A number of studies have been carried out on the issue of gender differences in the influence of male/female partner characteristics and there is some evidence that women are more sensitive to the influence of stressors affecting their husbands (Westman, 2006). As women are more involved in satisfying the needs of family members, it is possible that they are more exposed to the effects of stressful events affecting their family members. The results of this research only partly confirmed the last hypothesis of this study.

It should be considered that spouses of non-pathological families (the assessment of family quality were high) and those who had time to complete ten pages of the questionnaire (voluntarily) participated in the research. It would be interesting to include targeted dysfunctional families and couples with sufficient amounts of work-family conflict and to look for causes for such conflicts within the family and among different roles. Additionally, the research method included non-experimental assessment using questionnaires and self-assessment scales, resulting in a possible problem of non-objective and socially desirable responses, and the inability to reach a reliable conclusion on causal relationships that could be inferred by experimental and longitudinal designs. In this research, besides self-assessment measures, the spouses' assessments on the work and family domain were also taken into account. Further research should include assessments of other significant persons in different domains.

Conclusions

A general overview of findings shows that all three groups of predictors significantly contributed to the explanation of work-family conflicts and the hypotheses were mainly confirmed. The most relevant relationship is among one's own work characteristics and work-to-family conflict (both for men and women). Moreover, speaking of work-to-family conflict in men, one's own perception of family conflict is the second main relationship, followed by the wife's social support from work. In women, the husband's perceptions of family functioning is also the second main relationship, but the husband's perception of work environment is not relevant at all. When viewing family-to-work conflict, in men, one's own perception of wife's support and family conflict explains a slightly higher variance than job demands and control. In women, job control

also explains the significant variance, with the same predictive power as in men, but the only other and a more significant predictor is social support from their husbands. In addition, it should be outlined that personal values of both spouses become irrelevant for work-family conflicts when work and family environment are included. Non-significant relationships are of special relevance here as these results appeared in previous research as most outstanding.

A substantive amount of the variance of work-to-family and family-to-work conflict in men and women remained unexplained (especially for family-to-work conflict in women). The complexity of the experience of conflicts of work and family role needs to be taken into consideration, and one research can not fully comprehend all the essential determinants. It is necessary to consider the interrelationships of different groups of variables, particularly with social support at work and in the family, and to take into account that the order of introducing each group of variables could have influenced the significance of the contributions.

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The Role of Personality and Sensation Seeking in Understanding Sociosexuality

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Abstract

The main purpose of the study was to gain insight into relationship between sociosexuality, sensation seeking, and personality traits while reflecting on gender differences in short- and long-term mating orientation as dimensions of sociosexuality. Therefore, the goal was to explore the contribution of sensation seeking in predicting short- and long-term mating orientations over gender and personality traits. The data of 596 participants (62.9% female) was collected by an online survey consisting of personal data, Sociosexual Orientation Inventory, Sensation Seeking Scale and Big Five Aspect Scale. Gender, personality traits and sensation seeking explained a total of 16% of the variance in long-term mating orientation (LTMO), with agreeableness explaining the most and sensation seeking additionally explaining only 2% of its variance over gender and personality traits. The same predictors explained 37% of the variance in short-term mating orientation (STMO), with sensation seeking explaining the most with 16% above and beyond gender and personality traits. The results suggest that men are more prone to STMO, while women are more likely to have LTMO. When relationship status is considered, participants that are in relationship tend to be more prone to LTMO while participants that are single seem to be more prone to STMO. The results provide better understanding of sociosexuality and the contribution of sensation seeking, personality traits, and gender differences in comprehending the complex construct of sociosexuality.

Keywords: sociosexuality, sociosexual orientation, personality traits, sensation seeking, gender

Introduction

Sociosexuality or sociosexual orientation is a tendency or willingness to engage in sexual actions without emotional commitment (Simpson & Gangestad, 1991a). It was defined by Simpson and Gangestad (1991a), who distinguish a restricted sociosexual orientation, which includes need for closeness and commitment, from unrestricted one, which includes lack of the need for commitment and a tendency to have more sexual partners at once. According to Sexual strategies theory (Buss & Schmitt, 1993), humans engage in certain types of sexual relations in order to solve specific adaptive problems which have befallen their ancestors during the evolutionary process in the past. Therefore, mating preferences and decisions occurred as a result of the selection process, and current mating strategies depend on and are highly sensitive to temporal context of short- and long-term mating relationships (Buss & Schmitt, 1993). In addition, a general model of heritable personality differences describes personality traits as individual reaction norms of genotypes across different environments, resulting in different consequences (Penke, 2007). In other words, certain personality traits developed as a result of accommodating to specific environments in the past.

Due to flexibility of sexual behavior caused by different opportunities and constraints in local environments, Bailey, Gaulin, Agyei and Glaude (1994) suggest a model of sociosexuality which differentiates sexual behavior from sexual attitudes, therefore separating psychological from behavioural mating tactics. Webster and Bryan (2007) support this model, explaining that attitudes and behaviors correlate differently with certain aspects of personality. Following the idea of Bailey et al. (1994), Jackson and Kirkpatrick (2007) introduced a new, multidimensional model of sociosexuality, arguing that it provides more information about other mating strategies rather than just short-term ones, as was the case in a previous, dichotomous model. Therefore, they considered sociosexuality to be defined through three separate dimensions: short-term mating orientation (STMO), long-term mating orientation (LTMO) and previous sexual behaviors (PBO). As the model is developed as an expanded version of the original bipolar model, Jackson and Kirkpatrick (2007) consider restricted sociosexual orientation and LTMO, as well as unrestricted sociosexual orientation and STMO, synonyms. Besides emphasizing the importance of differentiating sexual attitudes from sexual behaviors, the authors also suggest that there is a need for separation of previous short-term sexual behaviors from total previous sexual behavior, as there are more individual variations and between-sex differences in short-term rather than long-term mating orientation (Buss & Schmitt, 1993; Jackson & Kirkpatrick, 2007).

Some research also suggests that risky sexual behavior, such as number of sexual partners, can be used as an indicator of sociosexual orientation (e.g. Hoyle, Fejfar, & Miller, 2000; Simpson & Gangestad, 1991a). It has also been proven to correlate with sensation seeking (Del Giudice, Klimczuk, Traficante, & Maestripieri, 2014; Donohew et al., 2000; Hoyle et al., 2000), or one's tendency to seek new, varied, intense experiences, and the willingness to take physical, social, and other risks in order to maintain the feeling of sensation (Zuckerman et al., 1972). Sensation seeking is comprised of four factors: Thrill and Adventure seeking refers to engagement in outdoor activities which include speed or danger; Experience seeking describes the need for various inner experiences, such as travel, drugs, or art in any form; Disinhibition expresses extraverted and hedonistic philosophy, and Boredom susceptibility stands for intense disliking repetition, routine and predictability in everyday actions (Zuckerman et al., 1972).

Previous research indicates positive correlation between short-term mating orientation and extraversion in terms of a more hedonistic outlook on sex and a higher level of engagement in sexual activities, both in Canadian and Eastern European sample (Barnes, Malamuth, & Check, 1984; Schmitt & Shackelford, 2008). STMO is in a positive relation with openness to experience and a negative one with agreeableness, while LTMO is related to higher levels of agreeableness, conscientiousness, and self-esteem (Jones, 2017). Furthermore, unrestricted attitudes, defined as more interest in casual sexual relations rather than long-

term ones, as well as more favorable attitudes toward uncommitted sexual actions, correlate positively with psychoticism and impulsivity, and are in a negative relation with agreeableness and conscientiousness (Barnes et al., 1984; Del Giudice et al., 2014). Emotional intelligence trait, including emotional regulation, low impulsiveness, and ability of maintaining fulfilling personal relationships, represents a predictor of higher LTMO in Americans (Figueredo, Cuthbertson, Kauffman, Weil, & Gladden, 2012), while shyness correlates negatively with both sociosexual attitudes and behaviours in a German sample (Penke & Asendorpf, 2008). Both short-term and long-term mating orientations are significantly predicted by HEXACO's Honesty-humility, Emotionality, and Conscientiousness, with the addition of Extraversion as a significant predictor of LTMO (Strouts, Brase, & Dillon, 2017). Kardum, Gračanin, and Hudek-Knežević (2006) found openness to be a more significant predictor of various sexuality aspects in men, while conscientiousness represented a more significant predictor in women, especially regarding sexual loyalty. Neuroticism was mainly not found to be significantly correlated with either sociosexual orientation (e.g. Barnes et al., 1984; Del Giudice et al., 2014; Jones, 2017), although some research found inconsistencies both cross-culturally and between the sexes (Schmitt, 2004; Schmitt & Shackelford, 2008; Wright & Reise, 1997). Moreover, high sensation seeking has been related to low conscientiousness and agreeableness (Zuckerman et al., 1993; Del Giudice et al., 2014) and is positively associated with extraversion, psychoticism, openness, and impulsivity (Eysenck & Zuckerman, 1978; Del Giudice et al., 2014; Hoyle et al., 2000; Webster & Crysel, 2012). It was also recognized as a significant mediator in the relationship between substance use, personality, sexuality variables and sexual risk taking in women (Turchik, Garske, Probst, & Irvin, 2010). Penke and Asendorpf (2008) found that sensation seeking is positively related to all aspects of sociosexual orientation (e.g. Del Giudice et al., 2014; Penke & Asendorpf, 2008), while other research emphasizes its strong effect on short-term mating characteristics and both unrestricted sexual attitudes and behaviours (Del Giudice et al., 2014; Hoyle et al., 2000). Moreover, global sociosexual orientation is found to be significantly lower in coupled than in single women, while men do not differ by relationship status (Penke & Asendorpf, 2008). Penke and Asendorpf (2008) also suggest that individuals in a relationship have more restricted desires and slightly higher unrestricted behaviour than the single. On the other hand, evolutionary theory explains that, in terms of benefits, women should be more prone to engaging in long-term relationships that provide them with resources for themselves and their offspring, while men should be more prone to engaging in short-term relationships, expanding their chances in directly expanding the number of their offspring (Buss, 2019). However, previous research was largely focused on examining differences in relationship status between restricted and unrestricted sociosexual orientation instead of comparing short and long term mating orientations.

Due to inconsistencies regarding relations between emotional stability and neuroticism with STMO and LTMO, as well as lack of research regarding these dimensions of sociosexuality, the aim of this research was to gain a more accurate insight in the relationship between sociosexuality, personality traits, and sensation seeking in men and women. Therefore, the goals of this research were (1) to gain an insight in a relationship between personality traits, sensation seeking and sociosexuality and (2) to explore additional contribution of sensation seeking in predicting sociosexual orientation over gender and personality traits.

Based on the examined literature, we hypothesized that:

- (1) STMO will be positively associated with extraversion and openness, and negatively with agreeableness and conscientiousness, LTMO will correlate positively with agreeableness, conscientiousness, and emotional stability, while PSB will be positively associated with openness and extraversion, and negatively with conscientiousness;
- (2) sensation seeking will be positively associated with STMO and PSB, and negatively with LTMO;
- (3) men will be more prone to STMO, while men and women will not differ in proneness to LTMO;
- (4) single participants will score higher on the dimensions of STMO and PSB, while participants

- who are in a relationship will score higher on the dimension of LTMO;
- (5) sensation seeking will explain most of the variance in STMO over gender and personality traits, while the variance of LTMO will be mostly explained by personality traits; agreeableness, conscientiousness and emotional stability

Method

Participants

The sample consisted of 596 students from the University of Zagreb, Croatia. The age of the participants ranged from 18 to 35 ($M=22.61$; $SD=2.87$), 62.9% of whom were female, and 50.2% of participants were single at the time the study was carried out. Due to the nature of the survey, a non-probabilistic sampling method and a convenient sample were used.

Instruments

Sociosexuality. Sociosexuality was measured by the Croatian version of Sociosexual Orientation Inventory (Jackson & Kirkpatrick, 2007) adapted by Nikolić, Šimić, Bubić and Pavela (2016). This 25-item questionnaire measures participants' attitude towards short- (STMO) and long-term mating orientations (LTMO) and previous sexual behavior (PSB). The participants evaluated their personal level of agreement with the first 20 items, listed on a seven-point scale (1-*strongly disagree*; 7-*strongly agree*). Item 21 required choosing one out of eight answers, while items 22-25 required entering a number. The results were formed separately for all three factors. Results for attitude towards STMO were formed by averaging answers on items 1 to 10, and for attitude towards LTMO by averaging answers on items 11 to 16, 18 and 20. Results for previous sexual behavior were formed as a sum of items 22, 23, and 24. The rest of the items weren't taken into analysis due to unclear factor structure and lower factor saturation. Reliability coefficients for subscales were medium to high (attitude towards STMO ($\alpha=.94$), LTMO ($\alpha=.91$), and PSB ($\alpha=.77$)).

Sensation Seeking. Sensation seeking (SS) was measured by the Sensation Seeking Scale V (SSS-V) constructed by Zuckerman, Eysenck & Eysenck (1978). In this paper Croatian version of SSS-V was used, taken from a study by Bratko & Butković (2003). This 40-item forced-choice questionnaire measures four factors: thrill and adventure seeking (TAS), experience seeking (ES), disinhibition (DIS), and boredom susceptibility (BS). Participants chose the answer A or B for each item, whichever described them better. The results were obtained by using the scoring key, ranging from 0 to 10 for each factor, or 0-40 for the whole scale. Cronbach's alpha reliability coefficient in this study was $\alpha=0.80$ for the complete scale and ranged from $\alpha=.59$ to $\alpha=.73$ for the four subscales.

Personality. Personality was measured by the Big Five Aspect Scale (BFAS) constructed by DeYoung, Quilty & Peterson (2007) and adapted by psychology students of Croatian studies in University of Zagreb, during Personality Measurement class with the mentorship of the professor Ana Butković (2018). BFAS measures five domains, each consisting of two aspects. In the domain of neuroticism, the aspects of volatility and withdrawal are differed, in agreeableness compassion and politeness, in conscientiousness industriousness and orderliness, in extraversion enthusiasm and assertiveness, and in openness/intellect intellect and openness. Each aspect consists of 10 items, making a total of 100 items. Participants' task was to evaluate their personal level of agreement with each item, listed on a five-point scale (1-*strongly disagree*; 5-*strongly agree*), which makes a total of 15 scores. Cronbach's alpha coefficient in this study ranged from $\alpha=.83$ to $\alpha=.88$.

Procedure

The participants were given an online questionnaire, constructed on Google Forms as a combination of personal data (age, gender, relationship status, and sexual orientation), Sociosexual Orientation Inventory, Sensation Seeking Scale V, and Big Five Aspects Scale. The online questionnaire was spread on social media, student's groups, and mailing lists. At the beginning of the questionnaire, the participants were explained the purpose of the research, anonymity, that the results will be used exclusively for scientific purposes and will be processed and displayed only at the group level. Participants were told in advance that participation is voluntary and that they can give up at any time. Every participant answered all of the questions in the survey and the main order of questions in every scale was previously randomized by determined software, so the effect of question order was brought to its minimum. Estimated time for completing the survey was 15 to 20 minutes.

Results

Firstly, descriptives for self-evaluated variables were calculated. Results of the Kolmogorov-Smirnov (K-S) test and skewness values show that the data was mostly approximately symmetric, with skewness between $-.282$ to $.369$. Agreeableness was an exception, as it was moderately skewed to the left ($-.730$). LTMO and PSB were the only variables that showed high skewness, -1.895 and 3.798 respectively. The distribution of the results shows that majority of participants estimate themselves as highly agreeable and highly prone to LTMO. On the other hand, high skewness that results on PSB show, may indicate that majority of participants reported having very little previous sexual behaviour. The results possibly reflect the sample of participants which are mostly young students that are not so sexually experienced.

Table 1 shows Pearson's correlations between sociosexual orientation, personality traits, and sensation seeking. For both mating orientations, only neuroticism showed insignificant correlation. LTMO significantly correlates with all measured variables ($p < .01$). The only negative correlation was between attitude towards LTMO and SS, which shows that participants who scored higher LTMO attitudes are more likely to have lower desire for sensation seeking. Moreover, correlations between LTMO and all personality traits were positive, which indicates that participants who scored higher on attitudes towards LTMO also tend to see themselves as more agreeable, extraverted, conscientious, and higher in the dimension of openness/intellect. STMO significantly correlates with all measured variables at $p < .01$, apart from extraversion ($p < .05$). The results imply that participants who scored higher on attitudes towards STMO were, on average, more likely to have higher desire for sensation seeking and evaluate themselves as more extraverted, open, and higher on intellect. On the contrary, those who scored higher on attitudes towards STMO had, in average, lower evaluations of their agreeableness and conscientiousness. PSB correlated positively with extraversion ($p < .05$) and negatively with agreeableness ($p < .01$), which suggests that participants who scored higher on PSB tend to see themselves as more extraverted and less agreeable. Correlations between PSB and other personality traits were not statistically significant.

Table 1. *Pearson's correlations between sociosexual orientation, personality traits, and sensation seeking (N=596)*

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. STMO	1	-.261**	.437**	.538**	-.002	-.228**	-.205**	.092*	.135**
2. LTMO		1	-.184**	-.164**	-.008	.324**	.158**	.202**	.210**
3. PBS			1	.294**	-.036	-.206**	-.029	.145**	.032
4. SS				1	.002	-.204**	-.327**	.140**	.207**
5. Neuroticism					1	-.062	-.322**	-.337**	-.078
6. Agreeableness						1	.142**	.100*	.299**
7. Conscientiousness							1	.330**	.136**
8. Extraversion								1	.422**
9. Openness/Intellect									1

**p<.01/ * p<.05

Sensation seeking significantly correlated with all measured variables ($p < .01$) except neuroticism. SS correlated positively with STMO and PSB, while being negatively associated with LTMO. Furthermore, it correlated positively with conscientiousness, openness/intellect, and extraversion, and negatively with agreeableness. The results suggest that participants more prone to sensation seeking tend to score higher on STMO and PSB, as well as see themselves as more extraverted, and open, and higher on conscientiousness and intellect. On the other hand, participants less prone to SS are more likely to engage in long-term relationships and see themselves as less agreeable.

After examining correlations, two three-step hierarchical regression analyses were conducted – one for predicting LTMO and one for predicting STMO (Table 2). Both hierarchical regression analysis contained the same sets of predictors. Gender was chosen as predictor in Step 1, , personality traits were added as predictors in Step 2, and sensation seeking in Step 3. Since neuroticism showed insignificant correlation with MO, it was excluded from further analysis. As shown in Table 2, gender, personality traits, and sensation seeking explained 16% of the variance of LTMO, while the same predictors explained 37% of the variance of STMO. Additional contribution of SS was only 2% over gender and personality traits when predicting LTMO, but when predicting attitudes towards STMO, sensation seeking additionally explained 16% above and beyond the same constructs.

Table 2 *Hierarchical regression analysis predicting attitudes towards LTMO and STMO.*

Predictors	Long-term mating orientation		Short-term mating orientation	
	R^2 change	β	R^2 change	β
Step 1	.01**		.08**	
Gender		-.12**		.28**
Step 2	.13**		.13**	
Gender		-.06		.26**
Agreeableness		.27**		-.23**
Conscientiousness		.07		-.22**

Extraversion		.13**	.11*
Openness/Intellect		.06	.21**
Step 3	.02**		.16**
Gender		-.05	.24**
Agreeableness		.24**	-.12**
Conscientiousness		.01	-.05
Extraversion		.14**	.02
Openness/Intellect		.10*	.09*
Sensation seeking		-.15**	.46**
Total R²	0.16**		0.37**

** $p < .01$ / * $p < .05$

Attitudes towards both LTMO and STMO showed that SS, openness/intellect, and agreeableness contributed significantly over measured variables. Additionally, extraversion appeared to be a significant predictor only for LTMO, and gender only for STMO. The most contributing predictor to understanding LTMO was agreeableness ($\beta = .24$; $p < .01$), while for STMO it was sensation seeking ($\beta = .46$; $p < .01$). Furthermore, gender became insignificant after adding personality traits (Step 2), and openness/intellect became significant after adding SS (Step 3) in predicting LTMO. Furthermore, after adding SS in Step 3 in predicting, conscientiousness and extraversion became insignificant.

Table 3 shows results of an independent sample t-test where participants were grouped based upon their relationship status. In one group, the relationship group, the participants were either in a relationship or in a marriage. In the second group, the single group, participants were single, divorced or in a nonexclusive relationship. The results show that participants that were single are more prone to STMO than participants that are in a relationship, $t(144) = -2.33$ ($p < .05$). Moreover, participants that were in a relationship tend to be more prone to LTMO than single participants, $t(144) = -6.31$ ($p < .01$). There is no difference regarding PSB or SS, $t(144) = .22$ ($p = .82$) between the two groups of participants

Table 3 Independent sample t-test: sociosexual orientation based upon relationship status

	Leven's homogeneity of variances test			<i>df</i>	<i>p</i>	<i>MD</i>	<i>SD</i>
	<i>F</i>	<i>p</i>	<i>t</i>				
STMO	3.87	.05	-2.33	144	.02**	-2.94	1.26
LTMO	.08	.78	-6.31	144	.00**	-6.48	1.03
PSB	2.43	.12	.22	144	.82	.21	.93

Note: ** $p < .01$, * $p < .05$

Discussion

Hypotheses based on previous research were largely supported. The results obtained provided a better understanding of sociosexuality based on personality traits, sensation seeking, and gender. So far, most of the research was inconsistent and poorly comparable due to differences in both conceptualization and measurement of sexual orientation (Schmitt, 2004; Schmitt & Shackelford, 2008; Wright & Reise, 1997), so the presented research contributes additional value to knowledge about sociosexuality.

Firstly, it is important to mention that distinguishing LTMO and STMO from previous sexual behavior in present research differs from sociosexuality measured as a dimension from restricted to unrestricted sociosexual orientation in previous studies (e.g. Simpson & Gangestad, 1991a). When comparing the results, it's important to differentiate attitudes from behaviour, with opportunities being an important factor influencing actual behaviour (Jackson & Kirkpatrick, 2007). With that in mind, we observed LTMO and STMO separately, together with their relationship with sensation seeking and personality traits to gain a better insight in sociosexuality.

The results have shown that people who are more extroverted and perceive themselves more intellectual and open to new experiences tend to be more prone to STMO which is an expected result when compared to previous research (Barnes, Malamuth, & Check, 1984; Schmitt & Shackelford, 2008). Schmitt and Shackelford (2008) demonstrated that positive and significant link between extraversion and STMO was the most consistent one for any world region, including Eastern Europe. In the presented study, conducted in Croatia, that link remains consistent but was not as strong as expected. Moreover, a significant association emerged between extraversion and LTMO as well. So far, extraversion was found to be positively associated only with STMO, but not with LTMO (Del Giudice et al., 2014; Eysenck & Eysenck, 1971; Schmitt & Shackelford, 2008). Some differences in results regarding relationship between extraversion and both mating orientations might occur due to usage of BFAS for measuring personality traits. In constructing the BFAS, extraversion originally consisted of three factors. DeYoung et al. (2007) excluded Excitement Seeking form further analysis of extraversion aspects in order to examine its loadings in the two-factor solution, which resulted with enthusiasm and assertiveness as two aspects of extraversion. Given that sensation seeking was observed as a separate construct with its own measurement, it's possible that the relationship between extraversion and STMO didn't emerge as strong as expected, because the relationship between STMO and SS was the one responsible for the significance in the research so far because it was being included as a part of measurement of extraversion.

Furthermore, the study conducted on Eastern European sample, found openness positively associated with most measures of STMO, but not with the LTMO ones (Schmitt & Shackelford, 2008). A positive association between extraversion and openness/intellect with both mating orientations exists in the Croatian sample, which is not so surprising having in mind that involvement in any kind of new relationship, with high level of intimacy, requires some level of openness to new experiences and extraversion. Previous research also suggests that people prone to STMO are less conscientiousness and less agreeable (Barnes et al., 1984; Del Giudice et al., 2014) which was also supported as well as hypothesis that people prone to LTMO would show higher agreeableness and conscientiousness (Jones, 2017).

When comparing the obtained associations with both mating orientations, positive association between agreeableness and conscientiousness and LTMO on the one side, and a negative association of those traits with STMO on the other, is a clear distinction between two mating orientations which was also a result consistent with the ones obtained research so far (Del Giudice et al., 2014; Eysenck & Eysenck, 1971; Schmitt & Shackelford, 2008). Furthermore, since previous studies found behavioral expressions of SS in various risk-taking behaviors (e.g. sexual behavior), and linked SS with different aspects of human life (e.g. social and marital relationships; Bratko & Butković, 2003), we further explored the relationship between

SS and mating orientations. Regarding relationship between sensation seeking and mating orientations, the results indicate that individuals with a lower desire for SS are more prone to engage in a sexual relationship with a long-term attitude. On the contrary, relatively strong correlation obtained between STMO and SS implies the importance of relationship between sensation seeking desire and willingness towards engaging in short-term sexual relations. When looking into how PBS, personality, and sensation seeking are connected, we can observe that correlations are relatively low, but existing between most of personality traits and PSB. People that were more open and experienced in their previous sexual behavior, were less conscientious and agreeable, but more extroverted and open with higher intellect.

Moreover, Simpson and Gangestad (1991b) demonstrated that gender accounts for a substantial amount of variation in sociosexuality, with males being more prone to unrestricted sociosexual orientation than females. More recent research also argues that the genders systematically differ much more in their desire and willingness to engage in short-term relationships than in their desire and willingness to engage in long-term relationships, not involving their previous sexual behaviour (Buss & Schmitt, 1993; Jackson & Kirkpatrick, 2007). Therefore, it is not surprising that gender became an insignificant predictor for LTMO after personality traits entered the analysis, which also shows the importance of personality traits above gender in explaining LTMO. Openness/intellect became a significant predictor for LTMO in the final step of the analysis, even above and beyond SS. Personality traits emerged as an important predictor for STMO as well, but after SS entered, conscientiousness and extraversion became insignificant. Nevertheless, gender seems to have an important role in STMO where male participants obtained a higher score than female participants. Regarding gender differences in LTMO and STMO, this study supports previous research with males being more prone to STMO than females. It supports recent studies that show how man and women differ more regarding STMO than LTMO (Buss & Schmitt, 1993; Jackson & Kirkpatrick, 2007). From the evolutionary point of view, the results reflect that men are more prone to engaging in short-term relationship because it is beneficial in expanding their chances in directly expanding the number of their offspring (Buss, 2019). On the other hand, evolutionary theory suggests that women are more prone to long term relationships (Buss, 2019), but since gender was not significant in explaining proneness to LTMO in this research, gender differences remain to be of interest for some further research.

When the participants were grouped based upon their relationship status, the results showed that the participants that were single are more prone to STMO than participants that are in a relationship. On the other hand, the participants that were in a relationship tend to be more prone to LTMO than single participants. Those results were expected based upon previous research suggesting that individuals in a relationship have more restricted desires and slightly higher unrestricted behaviour than those that are single (Penke & Asendorpf, 2008). Between the two groups of participants there is no difference regarding PSB. The majority of previous research focuses on the difference between restricted and unrestricted sociosexual orientation that includes previous sexual behavior. Based upon results obtained in this research, there is no difference in PSB between the participants that were in a relationship and the ones that were not. Therefore, the difference between the groups seems to be more significant when previous sexual behavior is excluded, and analysis is conducted only on LTMO and STMO.

A potential reason for the results not being more in line with previous research may be partly methodical. Each personality trait in BFAS consists of two separate aspects for which we assumed to perhaps further explain the role of personality in sociosexuality and sensation seeking more than personality traits themselves. But, when observing the items used for measurement of each aspect, we suggest that aspects do not grasp the whole trait. For example, conscientiousness didn't appear as significant as expected because, when looking on an aspect level, conscientiousness consists of orderliness and organization. Therefore, we believe that the items do not properly describe variables regarding relationship with other people, which is crucial for this study. Further research should include some other measure of personality to gain a more

accurate understanding the results. Instruments that can measure not only general personality traits, but personality on a facet level can be more valuable than BFAS for this type of research. Moreover, constructs such as self-esteem and narcissism can be interesting and helpful in gaining a deeper insight in the relationship between personality and mating orientations. Further research conducted in more objective manner could surely be of additional value. The results obtained can be used in therapy, counseling and coaching to help everyday problems that emerge from intimate human relationships.

Conclusion

The present research provides a better understanding of sociosexuality and supports distinguishing attitudes towards sexual behavior from actual behavior. There is a clear distinction in how the same set of predictors contributes to the explanation of each of the mating orientations. Higher agreeableness, extraversion, and openness/intellect with lower desire of SS significantly predict a positive attitude towards LTMO. Being a man, having lower agreeableness, but higher openness/intellect and desire for sensation seeking can significantly predict positive attitude towards engaging in short-term sexual relationships. Sensation seeking and gender appeared to be important predictors of short-term attitudes, with males being more prone to engage in that kind of relationship. Moreover, when relationship status is considered, participants that are in relationship tend to be more prone to LTMO while participants that are single seem to be more prone to STMO. The differences obtained in roles that personality and sensation seeking have in long- and short-term mating orientations provide an interesting direction for future research. The results imply that there is much more to understanding human sociosexuality than initially assumed.

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15

Social Identities and Attitudes towards Assimilationism and Multiculturalism in Four Multiethnic Communities

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Abstract

Relations between the ethnic majority and minorities in Croatia have been developing under the influence of different circumstances. Hence we expect different social contexts to shape social identities of the majority and the minorities in different ways. The relationship between social identities and attitudes towards multiculturalism and assimilationism, which determine the majority-minority relations, is particularly important.

Therefore, we compared the importance of different social identities of the majority and the minority group in four multi-ethnic communities, where minorities exercise their right to education in their respective mother tongues (Croats, Serbs in Vukovar, Hungarians in Baranja, Italians in Istria and Czechs in Daruvar). In addition, we were interested in differences in attitudes towards multiculturalism and assimilation with respect to the status of the group and the region. We also wanted to investigate the relation between ideological attitudes and the importance of social identities. The data was collected from 745 primary and secondary school students, members of minorities and the majority, aged 12 to 19.

The results show that the importance of specific social categories varies across regions and largely depends on the majority-minority group status. We found different patterns of relations between salience of specific social identities and the two ideological orientations, multiculturalism and assimilationism, depending on the region and group status. With an exception of Daruvar, among majority group members, ethnonationalism, rather than ethnic identity, was related to multiculturalism and assimilationism. Among minorities, these relations are considerably weaker and region dependent.

Keywords: multiculturalism, assimilationism, multi-ethnic communities, social identities

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Introduction

The term *identity* has been one of the main concepts in psychology ever since Erikson's work in the second half of the twentieth century (Erikson, 1966, 1968, 1994). There has been a substantial body of research reporting that the development of personal and social identity is the central task in adolescence (Albarello, Crocetti & Rubini, 2018; Brown, 1990; Meeus, 2011; Tarrant, 2002). Furthermore, in the 1990s a renewed academic interest in identities (especially in interpretations of national identity) took place. Although questions of identity have become both more salient and more important than ever, its interpretation remains vague (Verkuyten, 2005b). Social identities are not only shaped by the social context, but they themselves shape one's attitudes towards other groups. In modern societies attitudes towards the assimilationism and towards multiculturalism are especially relevant. Multiculturalism is an ideological foundation of the European Union, which is evident in its motto: "*In Varietate Concordia*"-"*United in Diversity*". However, while some people argue that multiculturalism corresponds to equality and democracy, others claim that multiculturalism challenges national integrity and unity. For some, it serves to prevent (ethno) nationalism, and to promote cultural diversity; for others, multiculturalism is the source of ethnic conflicts, which increases the need for assimilation (Kastoryano, 2009). We propose that whether attitudes towards multiculturalism (vs. assimilationism) will be dominantly positive in one country highly depends on the existing social and political circumstances in that country i.e. intergroup relations between the majority and minority groups in question. Furthermore, within each country there should be significant differences in the above mentioned attitudes depending on its "*microclimate*", that is the ethnic diversity and intergroup relations in any specific region. Thus, in this paper, we examine the importance of different social identities among the ethnic majority and minority groups in Croatia, along with their relations with specific attitudes towards assimilationism and multiculturalism.

In articulating *social identity theory* (SIT), Tajfel and Turner (1979; Tajfel, 1982) posited the distinction between *personal* and *social identity* which underpinned the difference between interpersonal (people define themselves as idiosyncratic individuals with no awareness of social categories) and intergroup (people relate entirely as members of their groups) ends of the spectrum of human interaction. Social identities involve more or less clearly defined social categories that distinguish people (such as gender, age, ethnicity, etc.), and based on those categories an individual is located in a social structure. Furthermore, people tend to evaluate their groups more positively and show in-group bias as a means of enhancing their social self-esteem (Brown, 2000; Ellemers, Spears & Doosje, 2002; Hornsey, 2008; Verkuyten, 2005b). According to *self-categorisation theory* (SCT; Turner & Reynolds, 2012), identity operates at different levels of self-definition rather than on a bipolar spectrum, but the central point is always the same: the impact of social groups on the way people perceive themselves and others can be understood only by taking into consideration the importance of the social context as one of the most important agents of development of intergroup attitudes (Ellemers et al., 2002; Maloku, Derks, Van Laar & Ellemers, 2016; Nesdale & Flesser, 2001; Verkuyten, 2017).

Identity as a dynamic social product cannot be understood except in relation to its social context and historical perspective. Just like being the only woman in the room can make you more aware of your gender, growing up in a multi-ethnic community can make your (as well as the other) social group more salient. It can be either a positive or a negative experience, depending on the intergroup relations and the status of your group in the community.

In line with what has been previously said, in this paper we examine the importance of different social identities among the ethnic majority and minorities in four different multi-ethnic communities in Croatia (Croats as the majority group, Serbs in Vukovar, Hungarians in Baranja region, Czechs in Daruvar region, and Italians in Istria). We chose these four specific regions in Croatia where Croats are the majority group living next to a minority group that is big enough to be recognised by the state and to exercise minority

rights, such as the right to education in their respective mother tongues (e.g. model A of minority education) (Čorkalo Biruški & Ajduković, 2008; Mesić & Baranović, 2005; NN 155/02, 47/10, 80/10, 91/11;). However, relations between the majority group and four different minorities in Croatia have been developing under different cultural and historical circumstances. Ever since the Croatian War of Independence, Vukovar has been developing as a post-conflict community divided along ethnic lines, where intergroup communication is flimsy and reconciliation is very slow (Čorkalo Biruški & Ajduković, 2009, 2012). As opposed to Vukovar, the other three contexts are more likely to meet conditions for optimal contact and develop positive intergroup attitudes. This is especially true for the Daruvar region where tensions between the two groups never existed, as well as for the Istria region with the long history of multiculturalism. Since social identities are formed and defined in the social world (Verkuyten, 2005b), we argue that historically, economically and culturally different social contexts will form social identities of the majority and the minorities in Croatia in different ways.

People inevitably belong to more than one group at a time i.e. they have multiple identities. For instance, the common in-group identity model recommends including former in-group and former out-group members in one superordinate category (i.e. the perception of one, more inclusive common group rather than two opposing groups) (Gaertner, Mann, Murrell & Dovidio, 1989). A psychologically less damaging strategy for minority groups who might fear being assimilated into a larger category is the dual identity model, which proposes the creation of a superordinate identity while simultaneously encouraging the retention of subgroup identities (Cameron, Rutland, Brown & Douch, 2006; Gaertner & Dovidio, 2000; Gonzalez & Brown, 2003; Levy, Van Zomeren, Saguy & Halperin, 2017; Verkuyten, 2016). Another example is cross-categorisation or social identity complexity, an approach that deals with the overlap between different social identities and examines the connection between the extent of such overlap and the salience of social categories (Brewer, 2010; Levy et al., 2017; Maloku et al., 2016; Roccas & Brewer, 2002). According to social identity complexity theory, intergroup relations may improve to the extent that people subjectively combine their multiple identities in complex in-group representations, which should be quite inclusive (Brewer, 2010).

Therefore, we started from their ethnic identity which is one of the most popular concepts today, both among scholars and among the wider public. However, people can be attached to their ethnic group in many ways that may have different consequences on intergroup relations. For instance, constructive patriotism, involving attachment and love for one's country, has to be distinguished from blind patriotism that involves uncritical support for one's country, and from nationalism, an ideology based on the premise that one's nation is superior to other nations (Bakić, 2006; Schatz, Staub & Lavine, 1999). In terms of social context in Croatia, it is more appropriate to refer to ethnonationalism, where nations are defined by a shared heritage and culture (common language, faith, and ethnic ancestry). It is different from a cultural definition of the nation, which allows people to become members of a nation by assimilation (e.g. USA); and from a linguistic definition, which puts all speakers of a specific language in one nation (Muller, 2008). Recent studies suggest that ethnonationalism, rather than ethnic identity per se, is detrimental for post-conflict reconciliation (Jelić, Čorkalo Biruški & Ajduković, 2014; Penic, Elcheroth & Morselli, 2017). Hence, apart from taking into consideration the ethnic identity as a social categorisation, we also examined ethnonationalism and its relation to multiculturalism and assimilationism. Finally, we examined the importance of two superordinate social categories - Croatian citizens (category that includes members of all ethnic groups in the country and allows minority and majority group members a common in-group identity) and Europeans (in order to encompass supranational identity that allows people to distance themselves from national and subnational identities and to define themselves in more cosmopolitan terms).

In addition, we were interested in investigating the relation of social identities and multiculturalism and assimilationism, as two basic ideological orientations that determine the relations between the

majority and the minority groups in multi-ethnic communities. Multiculturalism emphasises equality and respect for ethno-cultural differences (Ghosh, 2018). Verkuyten (2003) argues that promoting multiculturalism among children in schools results in less social exclusion based on ethnicity and higher concern for equal treatment, especially among children in the majority group. Furthermore, he suggests that, in the majority group, multiculturalism is associated with lower importance of ethnic identity (Verkuyten, 2005a). However, it is important how the majority group members perceive minority group members in terms of dual social identities (Verkuyten & Thijs, 2010). According to Teney (2011), there are two types of assimilationism: weak and strong. While the weak form allows minorities to keep and cherish their heritage in the privacy of their homes, strong assimilationism is a complex process in which minorities not only fully integrate themselves into a country of domicile, but also lose some aspects, or even their entire heritage. In general, and in line with SIT (Tajfel, 1982; Tajfel Turner, 1979), the minority group members are more likely to endorse multiculturalism more strongly and assimilationism less strongly than the majority group members, whereas for the majority group members the situation is the opposite (Čorkalo Biruški & Ajduković, 2012; Verkuyten, 2005a, 2005b). However, it would be wrong to claim that groups are homogenous in their attitudes towards multiculturalism and assimilationism and to ignore the importance of the social context. As research shows, when a multi-ethnic community is highly functional and intergroup relations are not disrupted, the majority group members endorse assimilationism less strongly (Jelić et al., 2014; Verkuyten & Martinovic, 2006). Furthermore, the strength of people's identification with their ethnic group is also an important determinant of multiculturalism and assimilationism (Verkuyten, 2005b; Verkuyten & Martinovic, 2006; Verkuyten & Thijs, 2002).

To summarise, drawing on the SIT perspective, we investigate the importance of different social identities (ethnic, Croatian, European and ethnonationalism) in the function of social context (Vukovar, Daruvar region, Baranja region, and Istria) and group status (Croats as the majority group and Serbs, Czechs, Hungarians, and Italians as respective minority groups). Furthermore, we explore the relation of these social identities to ideological attitudes- multiculturalism and assimilationism.

We expected that the ethnic social identity would be more important to both majority and minority group members in Vukovar in comparison to other contexts. Furthermore, we expected that ethnonationalism would be more pronounced in Vukovar (a post-conflict community) than elsewhere. We further hypothesised that the attachment to Croatia would be stronger for the majority group, and that this majority - minority difference would be the strongest in Vukovar and the least strong in the Daruvar region. On the contrary, we expected the European identity to be more salient for minority groups. We also expected that ethnonationalism would be more strongly related than ethnic identity regarding attitudes towards multiculturalism (negatively) and assimilationism (positively) regardless of the context. Finally, we expected this relation to be stronger for the majority group i.e. the group with a higher status in the society. Hence, we expected the majority group members to hold more positive attitudes towards assimilationism and less positive ones towards multiculturalism than minority groups, especially in Vukovar, and least of all in Daruvar.

Material and methods

Participants

The participants were 745 students (285 men, 455 women, and 5 participants did not specify gender) from 15 elementary ($n = 275$) and 12 high schools ($n = 470$), with the age range from 12 to 19 years ($M = 15.68$; $SD = 1.092$). The sample consisted of 455 Croats and 290 members of ethnic minorities (Serbs, Czechs, Hungarians, and Italians). The distribution across regions is shown in Table 1.

Table 1 *Sample composition by region in Croatia and group status*

Group status	Vukovar	Daruvar	Baranja	Istria	Total
Majority	156	97	63	139	455 (61.1%)
Minority	119	63	50	58	290 (38.9%)
Total	275 (36.6%)	160 (21.5%)	113 (15.2%)	197 (26.4%)	745 (100%)

Procedure

The questionnaires were administered in groups, during regular classes. Participation was voluntary and parental permission was obtained for underage students. All questionnaires were completed anonymously and were administered in the native tongues of the students. However, the minority members could choose whether they wanted to complete the questionnaire in Croatian or in their native language. In most classes, administration lasted a little under one school period (45 min), and during this time only a researcher was present in the classroom with the students. Students from all ethnic backgrounds had a high proficiency in the Croatian language, so the oral instructions were given in Croatian. However, the researcher was able to provide individual explanations if any of the students asked for any.

Measures

Social identities. The importance of different social identities was assessed with single-item measures. Participants indicated the extent to which belonging to a specific social category is important to them. Categories were as follows: *my ethnic group, Croatia, and Europe*. The responses were indicated on a 6-point scale ranging from 1 (*not at all important*) to 6 (*highly important*).

Ethnonationalism. Ethnonationalism was assessed by three items adapted from Čorkalo Biruški and Kamenov's (1999) research: "*My nation is better than other nations*", "*I would rather belong to my nation than any other nation*", "*In all historical conflicts with other nations my nation was always right*". The responses were indicated on a five-point Likert-type scale ranging from 1 (*highly disagree*) to 5 (*highly agree*). Higher values indicated more pronounced ethnonationalism. The reliability of the scale in this research ranged from $\alpha = .74$ in Daruvar region to $\alpha = .80$ in Vukovar.

Attitude towards multiculturalism. The attitude towards multiculturalism was assessed by the five-item scale used in Čorkalo Biruški and Ajduković's (2007) research. The items described acceptance of diversity (e.g. "*Ethnic minorities enrich the culture of every nation*"; "*Every state is obligated to protect the rights of national minorities*"), and the responses were indicated on a four-point Likert-type scale ranging from 1 (*highly disagree*) to 4 (*highly agree*). The reliability of the scale in this research ranged from $\alpha = .68$ in Vukovar to $\alpha = .79$ in Istria.

Attitude towards assimilationism. Attitude towards assimilationism was assessed by the five-item scale used in Čorkalo Biruški and Ajduković's (2007) research. Examples of items are "*All children should be attending classes on the Croatian language, with no exception for minorities*", and "*The majority nation should determine the way education should be organised in a country*." The responses were indicated on a four-point Likert-type scale ranging from 1 (*highly disagree*) to 4 (*highly agree*). The reliability of the scale in this research was between $\alpha = .75$ in Baranja region and Istria, and $\alpha = .82$ in Vukovar.

In attitudinal scales higher values indicate a more positive attitude towards the respective attitude object (i.e. having a greater tolerance of diversity or a greater inclination towards the assimilation of ethnic minorities). The neutral point is 2.5, which means that values below this point may be interpreted as indi-

cating negative attitude, and values above this point as indicating positive attitude.

Socio-demographic characteristics. The questionnaire also included some socio-demographic variables, such as age, gender, nationality, and residential status.

Results

Table 2 provides an overview of the means and standard deviations for all dependent variables across different social contexts.

Importance of different social identities

In order to examine the effects of social context and group status on the importance of different social identities and ethnonationalism, we conducted four univariate ANOVAs, for each dependent variable separately: 2 (ethnic majority/minority group status) x 4 (social context: Croato-Serbian in Vukovar, Croato-Czech in Daruvar region, Croato-Hungarian in Baranja region and Croato-Italian in Istria).

Regarding the *importance of ethnic identity*, ANOVA yielded a significant main effect of social context ($F(3,728) = 7.35, p < .01, \eta^2 = .029$), with ethnic identity being the least important to students in Istria ($M = 4.20; SD = 0.092$) and statistically lower from students in Vukovar ($M = 4.72; SD = 0.072$) and the Daruvar region ($M = 4.67; SD = 0.095$). Although we hypothesised that ethnic identity should be most important to both majority and minority group members in Vukovar (a post-conflict community), there was no significant difference in how students in Vukovar, Daruvar and Baranja region ($M = 4.51; SD = 0.111$) valued the importance of belonging to their ethnic groups.

Apart from ethnic identity, we also examined the salience of *ethnonationalism* in the function of social context and group status, where we expected ethnonationalism to be more pronounced in Vukovar than elsewhere due to high tensions between Croatian majority and the Serbian minority. However, results revealed only a significant main effect of the social context ($F(3,613) = 10.39, p < .01, \eta^2 = .048$) with a pattern similar to the importance of ethnic identity. This form of ethnic attachment was least present among students in Istria ($M = 2.30; SD = 0.085$) who differed significantly from the students in the Baranja region ($M = 2.88; SD = 0.104$) and Vukovar ($M = 2.86; SD = 0.067$). Contrary to our hypothesis, there was no significant difference between students in Vukovar, Baranja and the Daruvar region ($M = 2.59; SD = 0.103$). It is important to note here that ethnonationalism generally was not accentuated in our sample since the highest average score obtained is not above the neutral mid-point on our measure (see Table 2).

Table 2 Means and standard deviations for social identities, ethnonationalism, and attitudes towards multiculturalism and assimilationism

Dependent variables	Vukovar			Daruvar region			Baranja region			Istria
	Croats <i>M</i> (<i>SD</i>)	Serbs <i>M</i> (<i>SD</i>)	Croats <i>M</i> (<i>SD</i>)	Czechs <i>M</i> (<i>SD</i>)	Croats <i>M</i> (<i>SD</i>)	Hungarians <i>M</i> (<i>SD</i>)	Croats <i>M</i> (<i>SD</i>)	Italians <i>M</i> (<i>SD</i>)		
Social identities	Ethnic group	4.74 (1.202)	4.70 (1.161)	4.55 (1.261)	4.79 (1.034)	4.63 (1.231)	4.38 (1.123)	4.28 (1.131)	4.11 (1.175)	
	Croatia	4.82 (1.343)	2.92 (1.448)	4.78 (1.363)	4.79 (1.305)	4.77 (1.298)	4.06 (1.236)	4.10 (1.363)	3.23 (1.465)	
	Europe	3.76 (1.503)	3.59 (1.475)	4.16 (1.461)	4.43 (1.174)	3.53 (1.364)	4.62 (1.028)	3.82 (1.341)	3.89 (1.543)	
Ethnonationalism	2.85 (1.089)	2.87 (1.155)	2.51 (0.972)	2.67 (0.970)	2.96 (1.077)	2.80 (1.062)	2.36 (0.968)	2.25 (0.841)		
Multiculturalism	3.15 (0.543)	3.59 (0.390)	3.54 (0.459)	3.55 (0.441)	3.28 (0.586)	3.45 (0.455)	3.46 (0.568)	3.60 (0.455)		
Assimilationism	2.35 (0.650)	1.44 (0.530)	2.14 (0.756)	1.89 (0.728)	2.40 (0.682)	2.02 (0.576)	2.10 (0.686)	1.71 (0.540)		

Table 3 Correlations between different social identities and attitudes towards multiculturalism and toward assimilationism in all regions

Region	Social identities	Majority			Minority		
		Multiculturalism	Assimilationism	Assimilationism	Multiculturalism	Assimilationism	Assimilationism
Vukovar	Ethnonationalism	-.25**	.41**	.08			-.06
	Ethnic group	-.03	.14	.28**			-.15
	Croatia	-.08	.25**	-.09			.11
Daruvar	Europe	.02	.07	.10			.15
	Ethnonationalism	-.13	.39**	-.01			-.17
	Ethnic group	.26*	.03	.15			.08
Baranja	Croatia	.06	.11	-.26			-.03
	Europe	.20	.21	-.01			-.02
	Ethnonationalism	-.54**	.43**	.17			.07
Istria	Ethnic group	-.14	.06	.18			-.10
	Croatia	-.26	.11	-.09			.21
	Europe	.22	.14	-.08			.19
Istria	Ethnonationalism	-.34**	.46**	-.13			.21
	Ethnic group	.11	.15	.02			.03
	Croatia	.01	.02	-.00			.28*
Europe	.08	-.08	-.19			.13	

Note. ** $p < .01$; * $p < .05$

Considering the *importance of Croatia*, ANOVA revealed three significant effects. As expected, a significant main effect of group status was revealed ($F(1,725) = 63.58, p < .01, \eta^2 = .068$), with Croatia being more important to Croats ($M = 4.62; SD = 0.068$) than to ethnic minorities ($M = 3.75; SD = 0.085$). Furthermore, there was a significant main effect of the social context ($F(3,725) = 22.51, p < .01, \eta^2 = .073$), which revealed that students in Daruvar region ($M = 4.79; SD = 0.111$) and Baranja region ($M = 4.42; SD = 0.130$) placed higher value on belonging to Croatia compared to students in Vukovar ($M = 3.70; SD = 0.084$) and Istria ($M = 3.67; SD = 0.108$). However, a significant majority/minority status x social context interaction ($F(3,725) = 17.01, p < .01, \eta^2 = .055$) indicated a different pattern of results concerning salience of Croatian identity that depends on both factors. As can be seen in Figure 1 (Appendix), being a Croatian citizen is generally more important to Croats than minorities but the difference between the majority and the minority group in the importance they place on Croatian identity depends on the intergroup context. Thus, this difference is the largest in Vukovar ($F(1,725) = 130.12, p < .01$), mostly due to the Serbian minority who place little importance on Croatia. A similar pattern but with smaller difference can be seen in the Baranja region where the Hungarian minority expresses lower Croatian identity than the majority group ($F(1,725) = 7.60, p < .01$). However, in Daruvar region Croats and Czechs do not differ ($F(1,725) = 0.00, p > .05$) in the importance they place on Croatia, due to the fact that the Czech minority places just as high importance on Croatia. Istria region seems to be specific in a sense that both Croats and Italians place lower importance on Croatian identity than in other regions. However, majority-minority difference is still present in Istria, as Croats show stronger attachment to Croatia than Italians ($F(1,725) = 16.21, p < .01$).

As for the *importance of Europe*, an ANOVA conducted also revealed three significant effects. As expected, a significant main effect of group status was revealed ($F(1,729) = 7.92, p < .01, \eta^2 = .010$), with the European identity being more important to ethnic minorities ($M = 4.13; SD = 0.087$) than to majority members ($M = 3.82; SD = 0.070$). However, an effect size of this difference is negligible. Furthermore, there was a significant main effect of the social context ($F(3,729) = 6.85, p < .01, \eta^2 = .027$). Students in Daruvar region ($M = 4.29; SD = 0.114$) expressed higher European identity than students in Istria ($M = 3.86; SD = 0.110$) and Vukovar ($M = 3.68; SD = 0.086$). Again, a significant majority/minority status x social context interaction ($F(3,729) = 5.44, p < .01, \eta^2 = .021$) was obtained. Majority-minority difference in the importance of Europe was statistically significant only in Baranja region ($F(1,729) = 16.68, p < .01$), where Hungarian minority evidently had more salient European identity in contrast to Croats. Moreover, in the majority sample, Croats in Daruvar showed the strongest attachment to Europe and statistically different from Croats in Vukovar and Croats in Baranja region. As for the minority sample, European identity was clearly more important to Hungarians and Czechs than to Italians and Serbs (see Figure 2).

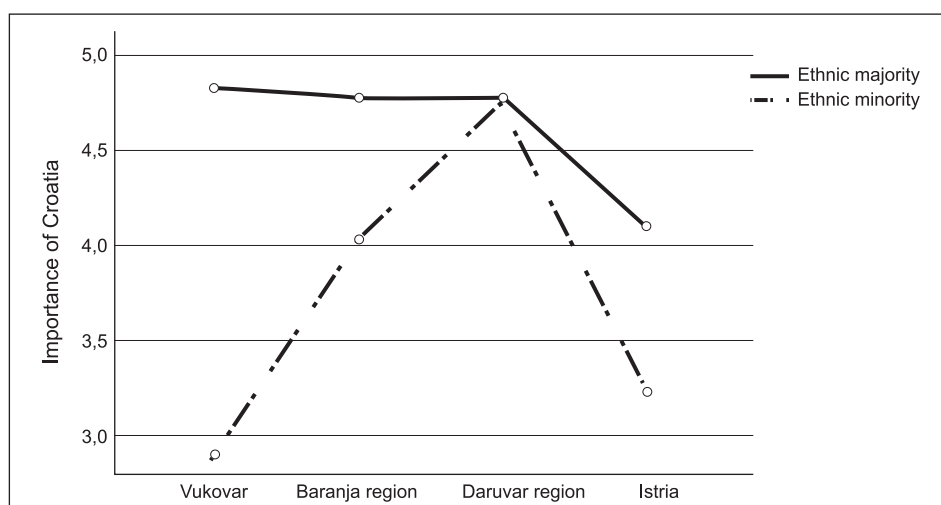


Figure 1. Importance of Croatia as a function of social context and group status
 Note. Scale range from 1 (not at all important) to 6 (highly important)

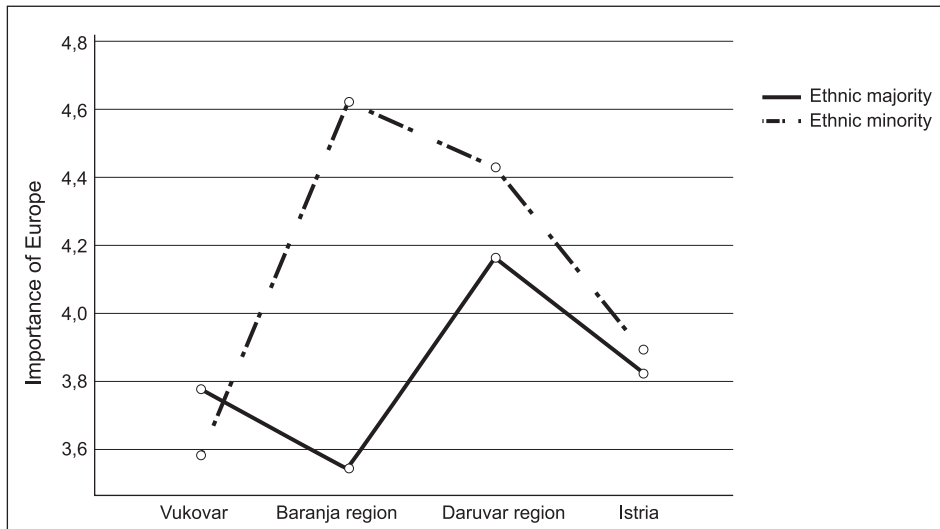


Figure 2. Importance of Europe as a function of social context and group status
 Note. Scale range from 1 (*not at all important*) to 6 (*highly important*)

Attitudes towards multiculturalism and assimilationism

Differences in attitudes towards *multiculturalism* were also evident. As expected, a significant main effect of group status ($F(1,682) = 21.21, p < .01, \eta^2 = .027$), suggested that minorities ($M = 3.55; SD = 0.032$) are more inclined towards multiculturalism than majority group members ($M = 3.36; SD = 0.026$). There was also a significant main effect of the social context ($F(3,682) = 6.02, p < .01, \eta^2 = .024$), and once again, the majority/minority status x social context interaction ($F(3,682) = 6.36, p < .01, \eta^2 = .026$) was significant. The majority-minority difference in the attitude towards multiculturalism was statistically significant only in Vukovar ($F(1,682) = 51.12, p < .01$), where Serbs were evidently more inclined to multiculturalism than Croats. Notably, the simple effect of social context was not significant in the minority sample ($F(3,682) = 0.99, p > .05$). As for the majority, we can argue that there are two homogenous subsets of results, Croats in Daruvar and Istria on the one side, and Croats in Vukovar and Baranja on the other side (see Figure 3).

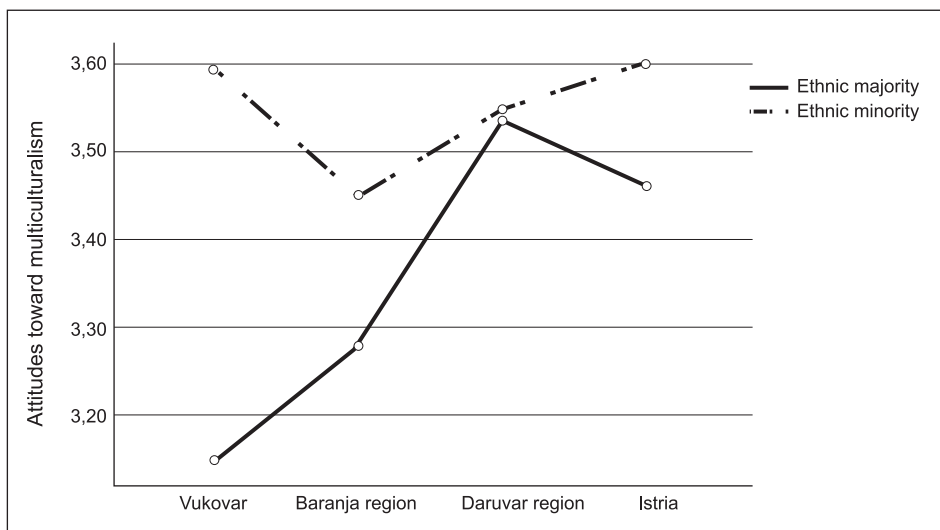


Figure 3. Attitudes towards multiculturalism as a function of social context and group status
 Note. Scale range from 1 (*highly disagree*) to 4 (*highly agree*)

A final ANOVA with attitudes towards *assimilationism* as a dependent variable revealed three significant effects. In line with the expectations, a significant main effect of group status ($F(1,672) = 77.89, p$

< .01, $\eta^2 = .093$), showed the majority group ($M = 2.24$; $SD = 0.034$) as being more prone towards assimilationism than the minorities ($M = 1.77$; $SD = 0.042$). There was also a significant main effect of the social context ($F(3,672) = 6.53$, $p < .01$, $\eta^2 = .023$), with students in Baranja region ($M = 2.21$; $SD = 0.065$) having more positive attitudes towards assimilationism than students in Vukovar ($M = 1.89$; $SD = 0.041$) and Istria ($M = 1.90$; $SD = 0.053$). A significant majority/minority status x social context interaction ($F(3,672) = 10.17$, $p < .01$, $\eta^2 = .037$) indicated that Croats were more prone towards assimilationism in all contexts in contrast to minorities, but also that there were some differences within each subsample. In accordance with the findings for attitudes towards multiculturalism, there are two homogenous subsets of results in the majority sample, Croats in Daruvar and Istria with more positive attitudes towards assimilationism on one side, and Croats in Vukovar and Baranja on the other side. In the minority sample, Serbs held the most negative attitude towards assimilation ($F(1,672) = 119.96$, $p < .01$), the only other significant difference was between Hungarians, and Italians, with Italians having a more negative attitude towards assimilation (see Figure 4).

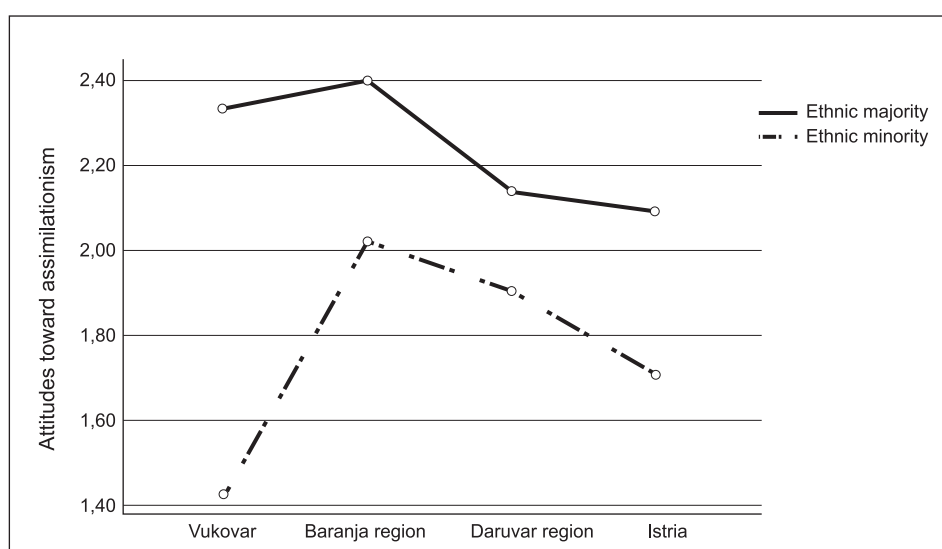


Figure 4. Attitudes towards assimilationism as a function of social context and group status Note. Scale range from 1 (*highly disagree*) to 4 (*highly agree*)

Correlations between measures of social identities and attitudinal measures

Correlation analysis between measures of different social identities (ethnic group, Croatia and Europe) and attitudes towards multiculturalism and assimilationism was done separately for each ethnic group (majority and minority) in every social context (Vukovar, Daruvar region, Baranja region and Istria) (see Table 3). In general, this analysis confirmed our expectation about ethnonationalism being more strongly related to attitudes towards multiculturalism (negatively) and assimilationism (positively) than ethnic identity.

In the majority sample, attitude towards assimilationism was moderately positively related to ethnonationalism in all contexts, while attitude towards multiculturalism was moderately negatively related to ethnonationalism in all contexts except in Daruvar region. In Daruvar region, ethnic identity was weakly positively related to attitude towards multiculturalism.

In contrast, in the minority sample there were only two significant correlation coefficients. In Vukovar, the ethnic identity was weakly positively related to attitude towards multiculturalism and in Istria there was weak positive relation between attachment to Croatia and attitude towards assimilationism.

We also examined the relationship between the attitudinal variables, that is, between assimilationism and multiculturalism. Depending on the context and group status, these attitudes were weakly to mod-

erately negatively related, or coefficients were not statistically significant. These findings were expected and are in line with previous studies that have shown that being more prone to multiculturalism means being less prone to assimilationism, and vice versa (Jelić et al., 2014; Levin et al., 2012).

Discussion

In this study our aim was to investigate the salience of ethnic identity, ethnonationalism, Croatian, and European identity in the function of social context (four different minority-majority contexts in Croatia) and group status (Croats as majority group and Serbs, Hungarians, Czechs and Italians as respective minority groups). Furthermore, we explored the relation of these social identities to two basic ideological orientations that determine the relations between the majority and the minority groups – multiculturalism and assimilationism. In other words, we wanted to explore whether majority – minority differences are indeed representative of the country in general or actually differ depending on the group in question or micro-level regional context in question.

In multi-ethnic communities the majority and the minority group members are very aware of their ethnicity as the multi-ethnic context makes it salient. Therefore, we expected ethnic identity to be very important to all our respondents. However, differences still exist suggesting different patterns of intergroup relations in a specific region. Not surprisingly, the ethnic identity is more important in Vukovar than in Istria. However, it seems that it is just as important in Daruvar region as well as in Baranja. In Istria, that is known for their emphasis on regional identity (Istrian identity), the ethnic identity is much less relevant than elsewhere.

We also included a measure of ethnonationalism as a different form of attachment to one's own ethnic group. Our findings show the same pattern as for ethnic identity i.e. ethnonationalism is significantly less pronounced in Istria than elsewhere (although across our whole sample ethnonationalism was on average relatively low). Both of these findings suggest that Istria, even though multi-ethnic, places less importance on ethnicity. In our research, we did not analyse the importance of regional identity, but we had a measure of Croatian (national) identity. Again, in Istria Croatian identity is lower than elsewhere, both for the minority as well as for the majority group members. All of these findings suggest that Istria does not follow the usual pattern of results and in the future regional identity should also be assessed. It seems that Istrians, both members of minority and majority groups, see their social identities as interchangeable and situation dependent. Istrians do not have one fixed and salient identity, at least not among identities we investigated in this research, and that is why their estimations are lower than the students in other contexts. In all other contexts, as expected, Croatian identity is generally more important to Croats than to minorities. However, it is noteworthy that the difference between the majority and the minority group in the importance they place on Croatian identity depends on the intergroup context. This difference is largest in Vukovar, mostly due to the Serbian minority who place little importance on Croatia. On the contrary, in Daruvar, Croats and Czechs do not differ in the importance they place on Croatia. It seems that in the majority sample Croats are rather homogenous in their strong attachment to Croatia (with Istria being an exception), while in the minority sample, Serbs and Italians, not differing between themselves, showed less attachment to Croatia in contrast to Hungarians and Czechs.

Finally, we focused on the European identity as a possible supranational identity that could unite both groups or perhaps serve as a "substitute" identity (instead of attachment to Croatia) for the minority ethnic groups. The results show that majority-minority difference in the importance of Europe was statistically significant only in Baranja, where Hungarians evidently had a more salient European identity, in contrast to Croats. However, when we analyse the importance of specific social categories (ethnic group,

Croatia, Europe) within each sample, it seems that Croatian identity is the least important of the three to all minorities except Czechs – for them Croatia is as important as their ethnic group and more important than Europe.

Taken altogether, our results show that Istria region is very different from Vukovar or Baranja. While in Istria ethnicity is less important, just as Croatian identity, in Vukovar ethnic identity is the most important identity and the differences between Croats as the majority and Serbs as the minority group members are more pronounced than elsewhere. Daruvar region, on the other hand, shows least differences between the majority and the minority group and shows that the two groups are well integrated.

In line with these data, the results showed that majority-minority difference in attitude towards multiculturalism was statistically significant only in Vukovar, suggesting polarisation of the two groups, with Serbs being more inclined to multiculturalism than Croats. In other contexts majority and minority groups did not differ significantly in their attitude towards multiculturalism. We believe that this finding has to be highlighted as it suggests that these are highly functional multi-ethnic communities where intergroup relations are not disrupted (as suggested by Jelić et al., 2014; Verkuyten & Martinovic, 2006). It is also noteworthy that the respondents on average scored higher for multiculturalism than for assimilationism regardless of their group status or intergroup context. As expected, the minorities also score lower on assimilationism than Croats in all contexts, with Serbs holding the most negative attitude towards assimilation. This is in line with earlier studies (Čorkalo Biruški & Ajduković, 2012; Verkuyten, 2005a, 2005b).

We hypothesised that social identities might be correlated with attitudes towards multiculturalism and assimilation. Specifically, we expected ethnic identity and especially ethnonationalism to show highest positive correlation with assimilationism (and negative with multiculturalism), while Croatian and European identity might be more strongly correlated with multiculturalism. The results confirmed that in Croats as the majority group it is ethnonationalism, rather than ethnic identity, that is moderately related to attitudes towards multiculturalism (negatively) and assimilationism (positively). This finding corroborates recent studies suggesting that ethnonationalism, and not ethnic identity, is detrimental for post-conflict reconciliation (Penic et. al, 2017). The only exception is Daruvar region, where ethnonationalism shows no correlations to multiculturalism. Instead, it is the ethnic identity that is positively related to multiculturalism, suggesting that Croats from Daruvar to whom ethnic identity is more important also have a more positive attitude towards minority rights of the Czechs in their region. This is exactly the opposite finding from earlier studies showing that multiculturalism is associated with lower importance of ethnic identity (Verkuyten, 2005a). We believe that this finding again confirms that in Daruvar the two groups are not in competition. Understanding that my group is important to me can lead to being more open to the needs of the other group when the two groups interact well.

Another finding that differs from previous findings is the positive correlation between Croatian identity and assimilationism in Croats in Vukovar. While ethnic identity is not related to that attitude, Croatian identity is. We believe that this finding suggests that in the Vukovar region, due to the fact that Vukovar for Croats is a symbol of the Croatian War of Independence, Croatian identity has different meaning than in other multi-ethnic communities in Croatia. It is not superordinate identity that has the ability to unite people of different ethnicities (like in the USA). Unfortunately, in Vukovar there seems to be yet another polarising identity, similar to ethnonationalism, as already shown by the fact that the Serbian minority places low importance to Croatia unlike their Croatian peers. As for the minorities, our hypotheses proved to be wrong; European and national identity are not related to multiculturalism. Croatian identity is positively related to assimilationism, but only among Italians from Istria. This is an intriguing finding suggesting that in Istria, the members of the minority group who are attached to Croatia and consider it their homeland have a more positive attitude towards assimilationism. The only other significant correlation was found between ethnic identity and multiculturalism in Serbs from Vukovar.

Limitations and suggestions for future research

This study was the first to investigate various social identities and their relation to assimilationism and multiculturalism in four multi-ethnic communities simultaneously. Furthermore, by conducting this study in fifteen primary and twelve secondary schools, we made sure that our sample is representative of the youth in the four mentioned communities.

However, several limitations of this study need to be taken into account. First of all, social identity measures in this study consist of only one item. Only ethnonationalism was measured by a four-item scale, whereas all other social identities were measured by an item referring to the importance that any participant places on a specific social category. Future studies should test our findings by using other validated and reliable scales.

Furthermore, future research could profit by using an additional measure of regional identity. We believe that the importance of regional identity might vary depending on the functionality of a multi-ethnic region and shed more light on findings pertaining to Istria region as well as Daruvar region.

Finally, researchers should also focus on qualitative methods that might offer deeper understanding of the differences between specific regions in intergroup relations.

Conclusions

Taken altogether, these results suggest that even within the same country different social contexts form social identities of the majority and the minorities in different ways. In the case of Croatia, results offer the perspective of four different ways in which a multi-ethnic community can function. Daruvar region (Croat-Czech context) represents a case of an integrated, if not even assimilated community with little difference between the majority and the minority group and no intergroup tensions. Here, the ethnic identity of the majority group is positively related to multiculturalism, clearly suggesting that the two groups are not in competition. Istrians are notorious for their regional identity and it is also evident in these data. Indeed, in Istria ethnic and national identity are less important than in other multi-ethnic regions in Croatia and the findings depict an integrated multi-ethnic region. In Vukovar, however, the situation is quite the opposite; ethnicity is very important and it seems that the identity is based on the differences between the majority and the minority. All differences between the minority and the majority group are more pronounced here than in other parts of Croatia. For example, the difference in the importance of Croatia is the largest in Vukovar compared to other regions, and a positive correlation between Croatian identity and assimilationism was found only among Croats in Vukovar. At the same time, Serbs hold the most negative attitude towards assimilation among all minorities. Finally, Baranja region does not stand out in any way and should be further investigated in future studies. Due to the ethnically complex situation in Baranja, where salient minorities are both Hungarians and Serbs, it would be interesting to see which of these two minority groups is more salient and relevant for shaping intergroup attitudes to the majority group.

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The Impact of the Length and Solvability of Anagrams on Performance and Metacognitive Judgments

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Abstract

Anagrams are commonly used in the field of problem solving since they provide a number of possible experimental manipulations such as length, difficulty, and solvability. Recent trends in cognitive psychology emphasize the importance of metacognitive processes which accompany human reasoning, decision making and problem solving. In this study, our goal was to measure performance and metacognitive judgments while manipulating the length and solvability of anagrams. Participants were in general faster for shorter and for solvable anagrams. Additionally, the difference between shorter and longer anagrams was significantly larger for solvable compared to unsolvable anagrams. The only significant effect on accuracy was the length with a higher accuracy for shorter anagrams. For judgments of solvability length was again the only significant factor with shorter anagrams initially judged as more solvable. Finally, the analysis of post-trial judgments of difficulty showed both effects were significant. Solvable and shorter anagrams were judged as easier in general. However, the difference in judgments of the difficulty between shorter and longer anagrams was significant only for solvable anagrams. In total, participants seem to rely on extremely salient cues (length) when making initial metacognitive judgments while post-trial judgments are impacted by more factors. Further experiments should provide a more in-depth study of the differences depending on solvability and accuracy (e.g. differences in metacognitive judgments between correctly solved solvable anagrams and correctly recognized unsolvable anagrams).

Keywords : problem solving, anagrams, metacognition, unsolvable problems

Introduction

Metacognition is traditionally described as cognition about cognitive processes, or as “knowledge about knowledge” (Flavell, 1979). Furthermore, the concept of metacognition can be divided into metacognitive knowledge and metacognitive regulation. Metacognitive knowledge is described as knowledge and beliefs which have an impact on specific cognitive processes. For example, knowledge about particular abilities and strategies which can be helpful while performing a specific task. On the other hand, metacognitive regulation is a concept which includes both metacognitive monitoring and metacognitive control. Metacognitive monitoring includes processes which provide information about the efficiency of cognitive processes involved in some task. Many circumstances and factors, both related and not related to the task, may influence the accuracy of the monitoring feedback when compared to the actual efficiency while solving a specific task. It is important to note that metacognitive monitoring includes processes which occur before, during and after the solving of a particular cognitive task. Finally, metacognitive control is related to different types of active control of cognitive processes based on metacognitive knowledge and monitoring. More specifically, it usually includes planning, choosing, the use and changing of strategies involved in a particular kind of cognitive task (Nelson & Narens, 1990).

One of the key early endeavors of metacognitive scientists was to investigate and describe the mechanisms which underlie metacognitive monitoring and control, as well as the development of useful research paradigms. This kind of research can target different cognitive processes. Traditionally, impactful early metacognitive research was conducted in the area of memory (meta-memory) where research paradigms and metacognitive parameters were developed (Nelson & Narens, 1990). Following this tradition, by adapting the methodology and parameters adequately, the metacognitive approach was incorporated into reasoning research, as well as research of other forms of thinking. Consequently, the meta-reasoning framework was developed in order to investigate the metacognitive processes which occur in parallel and/or in relation to different reasoning and, more generally, thinking processes. For a more detailed review of the meta-reasoning framework, see work by Ackerman & Thompson (2015; 2017). In meta-reasoning research, metacognitive parameters can be measured before (e.g. judgment of solvability), during (e.g. feeling of rightness; initial judgment of confidence) or after (e.g. final judgment of confidence) the completion of reasoning processes. A brief summary of the main meta-reasoning findings includes the following:

1. Actual performance is rarely predictive of confidence and other metacognitive ratings, and in addition participants tend to show systematic overconfidence (Bajšanski, Močibob, & Valerjev, 2014; Dujmović & Valerjev, 2018; Thompson & Johnson, 2014; Thompson, Prowse Turner, & Pennycook, 2011; Valerjev & Dujmović, 2017).
2. Metacognitive judgments are often better predicted by the so-called indirect metacognitive cues such as answer fluency and detection of conflict between two or more answers. Response times, which are the measure of answer fluency, usually moderately to highly correlate with metacognitive judgments (Ackerman & Zalmanov, 2012; Thompson, Evans, & Campbell, 2013; Thompson, Prowse Turner, et al., 2013).
3. Conflict detection and resolution is another important cue that may significantly impact metacognitive judgments independently of fluency (Dujmović & Valerjev, 2018).
4. Lower initial and on-going metacognitive judgments are correlated with a higher probability of answer change when prompted to rethink the response (Shynkaruk & Thompson, 2006; Thompson & Johnson, 2014; Thompson, Prowse Turner et al., 2013).
5. It has been demonstrated that significant inter-individual differences in sensitivity to conflict detection and the modus of its resolution exist (Dujmović & Valerjev, 2018; Frey, Johnson, & De Neys, 2018; Mevel et al., 2015).

These findings can be considered separate from broader models of reasoning, but they also fit well into the dual-process approach to reasoning (for this approach see Evans, 2008; Evans & Stanovich, 2013) according to which, our reasoning is governed by one or more rapid, heuristic, automatic, intuitive processes which may (if there is more than one of them), end in conflicted outcomes. Sometimes this conflict is resolved by another, more analytical, deliberate and slower process.

Many reasoning tasks in meta-reasoning research are constructed in a way to exploit the conflict between the so-called intuitive (or heuristic) and analytical answers which are found in dual-process research. Typical dual-processing tasks include formal logic tasks such as categorical syllogisms (Thompson & Johnson, 2014; Thompson & Morsanyi, 2012), base rate neglect task (De Neys & Glumicic, 2008; Dujmović & Valerjev, 2018; Pennycook, Fugelsang & Koehler, 2015), items from Cognitive Reflection Test (Toplak, West & Stanovich, 2014) etc. Most of these can traditionally be categorized as reasoning tasks while some fall within the field of judgment and decision-making (JDM). The distinction between reasoning and JDM tasks is not always clear since some of them are considered as members of both categories, but JDM tasks always incorporate making a choice based on some aspect of statistical reasoning and/or subjective probabilities (e.g. base rate task or Linda problem). Reasoning and JDM tasks are usually solved in one or two steps after one or more answers are generated by means of heuristic and/or analytical processes. On the other hand, Ackerman (2014) described goal-driven tasks which were investigated in the rich tradition of problem-solving research in psychology. Goal-driven tasks include various problem tasks such as the *hobbits and orcs* problem, the Tower of Hanoi problem, chess problems, anagrams etc. These problems cannot be solved in a single step. Problem tasks are usually solved in a series of steps during which the solver compares his current state with the goal state. The goal-driven nature of problem solving is derived from Newell & Simon's (1972) cognitive theory of problem solving according to which problem solving may be illustrated as the search for a path through the problem space. The path links the initial state and final (goal) state of the problem space through a series of interstates. Moving from one state to another is achieved through the use of allowed operators. An example would be the movement of discs in the Tower of Hanoi problem by adhering to the rule that a larger disc cannot be placed on top of a smaller one and that only one disc at a time is allowed to be moved from peg to peg. The problem solver has the mental representation of his current state and its neighborhood, as well as the mental representation and the estimated distance to the final state. General problem-solving strategies, such as *hill climbing* and *means-ends analysis*, are based on the solver choosing the next move by evaluating which action would lead to a state closest to the goal. When choosing the operator, and by proxy, the next state, both heuristic and analytical processes may be activated, as well as more complex cognitive processes such as planning and evaluation of strategies.

Metacognition in problem-solving

In an early paper which dealt with metacognitive aspects of problem solving, Metcalfe (1986a) presented subjects with various insight problems and asked them to estimate the feeling-of-knowing judgment for each problem after a short presentation. After that, the participants tried to solve the presented set of problems. For comparison, in Experiment 2 participants estimated feeling-of-knowing judgments for memory tasks. Participants could predict their memory performance well, but their metacognitive predictions in the insight problem solving were nonexistent. In another paper, Metcalfe (1986b) asked participants to provide on-going metacognitive judgments which are labeled feeling-of-warmth. Participants had to estimate how warm, or how close they are to the solution in regular time intervals during their work on a given problem. Among five experiments, two used various problem tasks and three used anagrams. On-going feelings of warmth showed a very slow increase and then suddenly jumped to maximum values when the solution was reached, and this pattern is typical for insight problem solving. Metcalfe and Wiebe (1987)

compared on-going feelings of warmth for insight and non-insight problems. The results indicated that warmth judgments increased incrementally for non-insight problems, but not for insight problems. This is because insight problems are usually solved in a moment of sudden illumination and it is hard to estimate the closeness to a solution before that moment.

Important work on metacognitive judgments that accompany thinking processes during problem-solving behavior was done by Ackerman (2014). She proposed the Diminishing Criterion Model which elegantly describes how both on-going metacognitive judgments and the final criterion that problem solvers strive to reach change during goal-driven thinking tasks. As more and more time is invested in problem solving, on-going metacognitive judgments (such as intermediate judgments of confidence) increase. However, at the same time, the compromise on the acceptable final goal (the criterion) also increases, which in turn decreases the final criterion. When the criterion is reached the problem-solving behavior stops. Because of that, final judgments of confidence in goal-driven tasks are still negatively correlated with solving time which was also obtained in a second study (Ackerman & Zalmanov, 2012).

Anagrams and metacognitive judgments

Anagrams are scrambled nonsense strings of letters which have to be rearranged in order to form a word. Anagram solving tasks have been used in studies spanning different areas of cognition and language from research on the mappings between visual and lexical representations (Witte & Freund, 2003) to memory processes (Bernstein, Rudd, Erdfelder, Godfrey, & Loftus, 2009) and problem-solving strategies (Novick & Sherman, 2003). It has been shown that anagrams typically get solved in one of two ways. First, the solution presents itself through what seems like insight, people are not aware of the stepwise process (Novick & Sherman, 2003), although this depends on the structure of the anagram itself. The second type of solution results from what would be a classical problem-solving process in which participants rearrange the letters in a serial manner until they solve the problem. Studies have found that many different aspects influence the success in anagram solving tasks. These aspects include both the characteristics of the anagram and the traits of the solvers, as well as their interaction. For example, reading fluency has been shown to predict success of anagram solving in children (Deloche, Ott, & Tavella, 1995; Sarris & Panagiotakopoulos, 2013). Anagram length seems to have a large influence on the success but also on the process of solving anagrams. Longer anagrams are generally more difficult to solve (Kaplan & Carvellas, 1968; Gilhooly & Johnson, 1978) and a review has shown that the number of syllables seems to be at the root of the influence length has on difficulty, rather than simply varying the number of characters (Muncer & Knight, 2010). Some characteristics of the anagrams have counter-intuitive effects on difficulty. For example, everything else held equal, anagrams easier to pronounce are more difficult to solve than anagrams which are harder to pronounce (Mayzner & Tresselt, 1958; Novick & Sherman, 2008). This implies strategies which involve reorganizing chunks rather than single letters, which draws similarities with heuristics in reasoning and meta-reasoning research.

The metacognitive aspects of anagram solving have been a target of a small number of studies so far. Metcalfe (1986b) measured ongoing ratings of warmth during anagram solving in three experiments. She found that correctly solved anagrams usually have a pattern of ratings which indicate an insight-based solution. The warmth ratings do not increase sharply until the final solution is given. On the other hand, incorrectly solved anagrams have a larger proportion of patterns which suggest incremental increase when compared to the correctly solved anagrams. Additionally, two of the experiments showed that warmth ratings for incorrect solutions were higher towards the end of the problem-solving process when compared to the correct ones. This was attributed to participants using a satisficing strategy, and in the experiment where that was encouraged the effect was larger. The strategy allows for *good enough*, inelegant solutions

where the solution is gradually accepted to a greater degree showing an incremental pattern. Indeed, when participants were encouraged to use this strategy, they had a lower proportion of correct responses and the warmth ratings showed an incremental pattern rather than an insight pattern.

Kelley and Jacoby (1996) measured metacognitive ratings in an indirect manner. They asked the participants in various experimental conditions to indicate how difficult an anagram would be to solve for other people. The results showed that familiarity with the solution word, recognition and an effect of personal experience on ratings. Higher familiarity and recognition lead to lower estimates of difficulty and solving the anagrams or seeing the solution also reduced difficulty estimates.

Finally, Topolinski, Bakhtari and Erle (2016) conducted the only large-scale study of metacognition during anagram solving. Their goal was to determine the influence of anagram length, pronounceability, and actual solvability on metacognition. They did not ask the participants to solve the anagrams, just to give estimates of whether the anagrams were solvable, the effort needed to solve them, and the estimated time needed to solve them. The results showed that shorter anagrams were rated as easier to solve when looking at the different metacognitive estimates participants gave. This was also true for anagrams easier to pronounce, showing that pronounceability is a metacognitive cue even if it actually predicts lower success rates as shown in other studies. Some of the results in this study also show that metacognitive estimates differentiated solvable from unsolvable anagrams, with higher ratings of effort and required time as well as a lower proportion rated as solvable for unsolvable anagrams.

As this short review shows, the metacognition of anagram solving has not been studied to a great extent in the current literature. Even the most comprehensive study does not actually include the process of solving anagrams, just their assessment based on short presentations. The goal of this experiment was to determine how two distinct features of anagrams (length and solvability) influence main performance indicators (proportion of correct solutions and solution time) and metacognitive ratings given before (judgments of solvability), and after the solution has been given (judgment of difficulty). We expected a strong effect of length on both performance and metacognitive indicators. Shorter anagrams were expected to be accompanied with higher judgments of solvability, a larger proportion of correct solutions, shorter solution times and lower judgments of difficulty when compared to longer anagrams. Solvability was expected to impact solution times and the proportion of correct responses (the correct response for unsolvable anagrams was recognizing it was in fact unsolvable). However, previous studies do not offer a clear prediction of actual solvability on metacognitive ratings. Topolinski et al. (2016) found a difference between solvable and unsolvable anagrams, but with a small effect size and without the participants having experience in solving the actual anagrams. If solvable and unsolvable anagrams showed a difference in judgments of solvability and difficulty, we expected the effect to be larger for shorter anagrams when compared to longer ones.

Method

A total of 27 participants was recruited among undergraduate psychology students from the Department of Psychology at the University of Zadar.

The experiment was a 2 (anagrams/non-anagrams) \times 2 (two-syllable length/three-syllable length) fully within-subject design. For the purposes of the current study, twelve items were chosen from Ostojić (2016), three items per experimental condition. All the anagram solutions were in the singular nominative, while non-anagrams were created by modifying otherwise solvable anagrams. The modification was a single letter change. While analysing responses it became apparent that one two-syllable non-anagram was solvable with a solution being in the plural genitive. This item was removed from further analysis.

The single trial procedure can be seen in Figure 1.

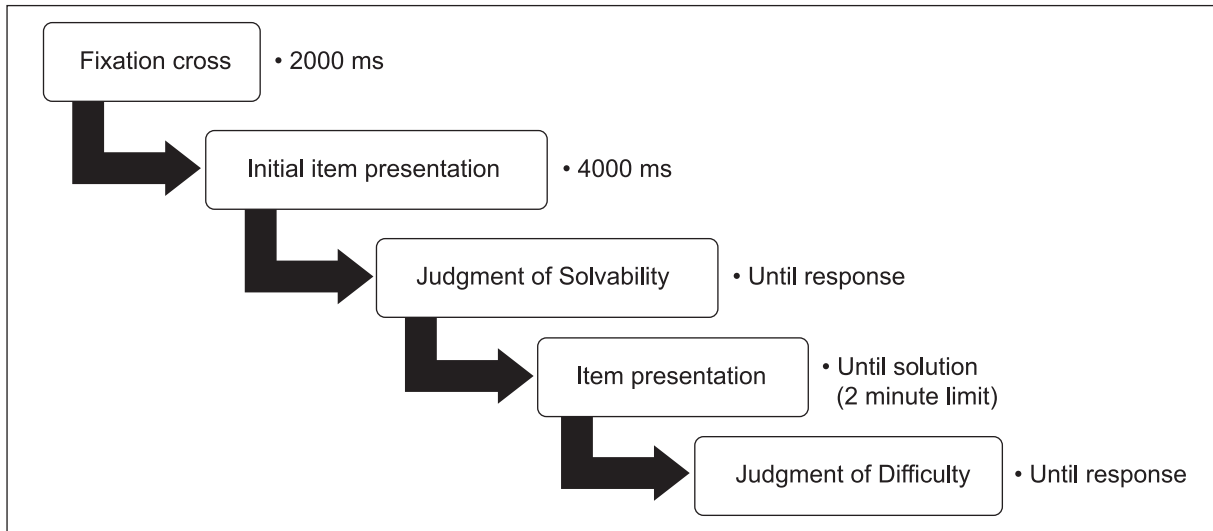


Figure 1 Single trial procedure diagram

Participants were initially shown each item for a duration of 4000 ms after which they gave judgments of solvability on a 7-point Likert scale ranging from *definitely unsolvable* to *definitely solvable*. Following the judgment of solvability, the item was presented again with a text box beneath it. Participants were given a maximum of two minutes to type their response. They were instructed to type “n” if they concluded there was no valid solution, and “o” if they thought there was a solution but that they would not be able to find it and made the decision to give up on that item. Finally, participants made a judgment of the difficulty on a 7-point Likert scale ranging from *extremely difficult* to *extremely easy*. The order of the scale points was from difficult towards easy in order to make it congruent with judgments of solvability which ranged from unsolvable to solvable. The item order was randomized for each participant, solutions, solution times and judgments were recorded for analysis.

Results

The mean percentage of correct responses, solution times and metacognitive judgments were calculated for the final analysis. Mean judgments of solvability may be observed in Figure 2, percentage of correct solutions in Figure 3, solution times in Figure 4 and judgments of difficulty in Figure 5.

In order to determine the effect of solvability and length on the dependent variables, four 2×2 repeated measures analyses of variance were conducted. Results of these analyses can be seen in Table 1.

Table 1 *Solvability by length ANOVA results*

	Solvability		Length		Interaction	
	$F(1, 26)$	η_p^2	$F(1, 26)$	η_p^2	$F(1, 26)$	η_p^2
Judgments of solvability	0.98	.04	10.05**	.28	0.70	.03
Percent correct	4.06†	.13	24.05**	.48	3.51‡	.12
Solution time	25.05**	.49	18.71**	.42	10.07**	.28
Judgments of difficulty	54.10**	.68	12.62**	.33	8.97**	.26

** $p < .01$; † $p = .055$; ‡ $p = .072$

The analysis shows only a main effect of item length on judgments of solvability. Participants gave significantly higher initial judgments of solvability for two-syllable items when compared to three-syllable items (Figure 2).

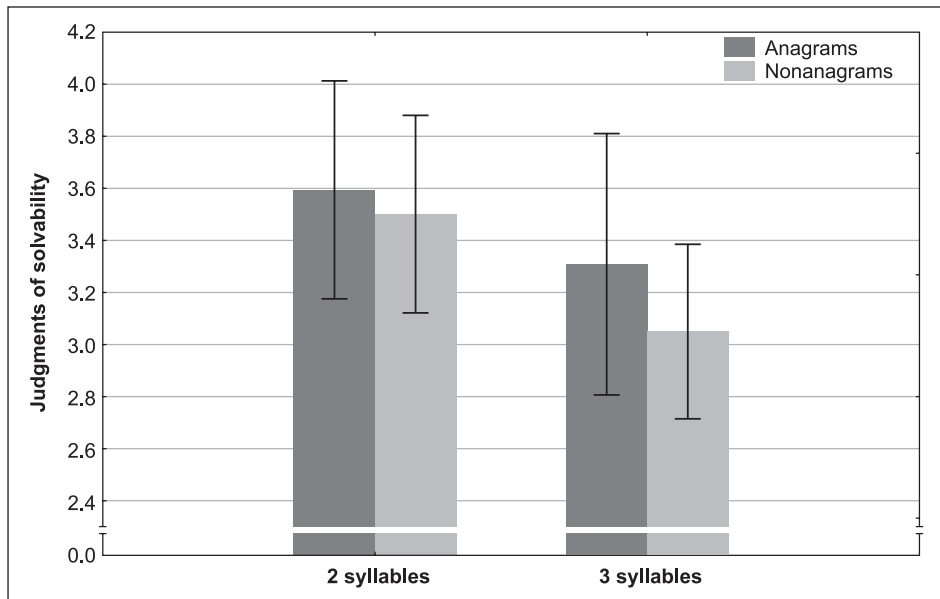


Figure 2 Judgments of solvability as a function of solvability and item length (spreads represent 95% CI)

Before reviewing the results for the percentage of correct solutions it is important to note, once more, that the correct response for non-anagrams was the recognition the item was indeed unsolvable. The main effect of length was significant for the percentage of correct solutions while the main effect of solvability and the solvability by length interaction were marginally significant ($p = .055$ and $p = .072$).

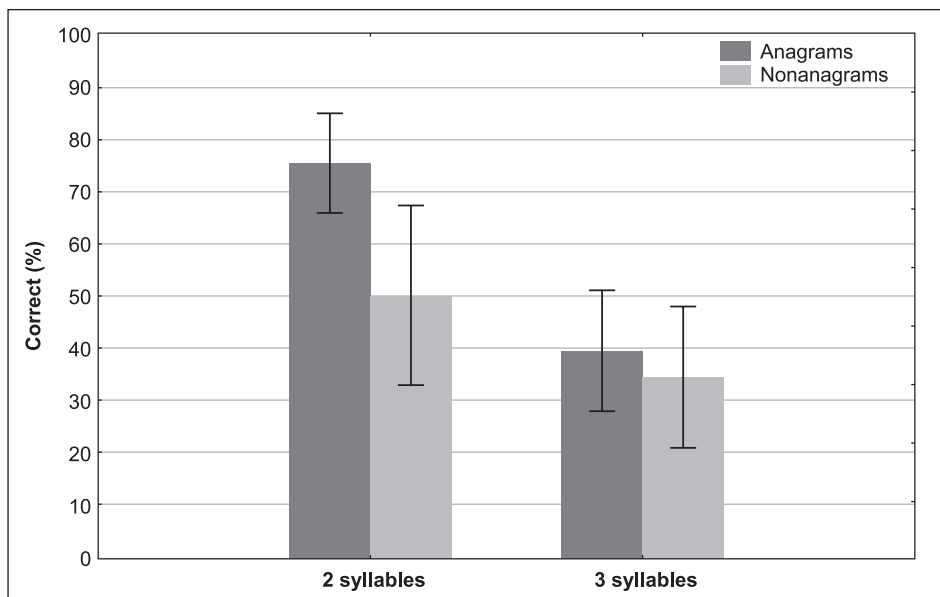


Figure 3 Percent correct as a function of solvability and item length (spreads represent 95% CI)

Post-hoc analysis (Tukey HSD) shows an interaction effect. Participants generally had a larger percentage of correct solutions for shorter items as well as for anagrams. However, the effect of solvability was only significant for the shorter items (Figure 3).

The analysis of solution times revealed that both of the main effects as well as the interaction effect were significant.

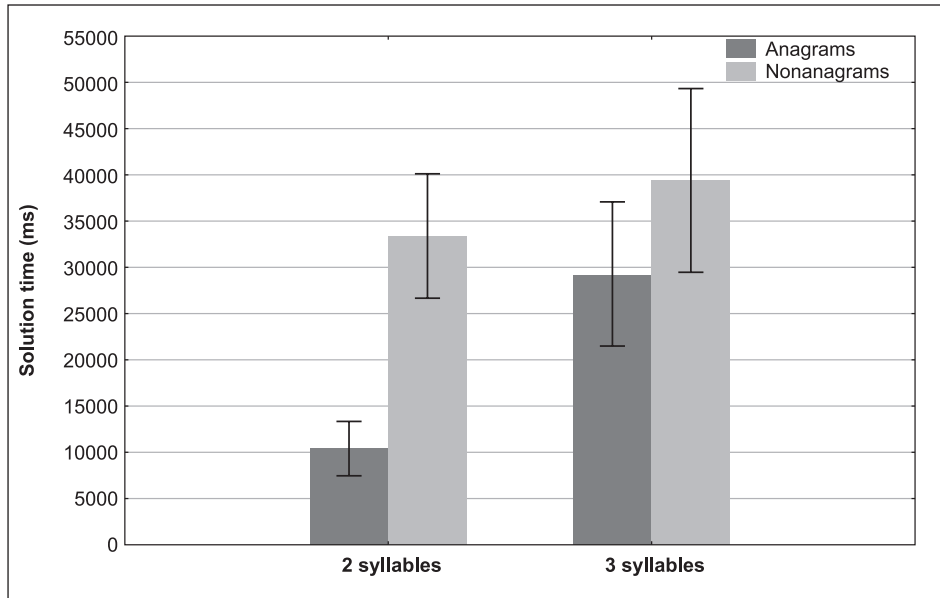


Figure 4 Solution times as a function of solvability and item length (spreads represent 95% CI)

Participants were generally faster in anagrams when compared to non-anagrams and in short when compared to longer items. Post-hoc analysis showed solution times were significantly shorter for short anagrams compared to all other conditions. Additionally, the effect of solvability was stronger for short items, and the effect of length was not significant for non-anagrams.

The final analysis of variance determined significant main and interaction effects on judgments of difficulty. Shorter items and anagrams were generally judged as easier (Figure 5). Post-hoc analysis revealed that the effect of solvability was stronger for short when compared to long items, resulting in a significant solvability by length interaction.

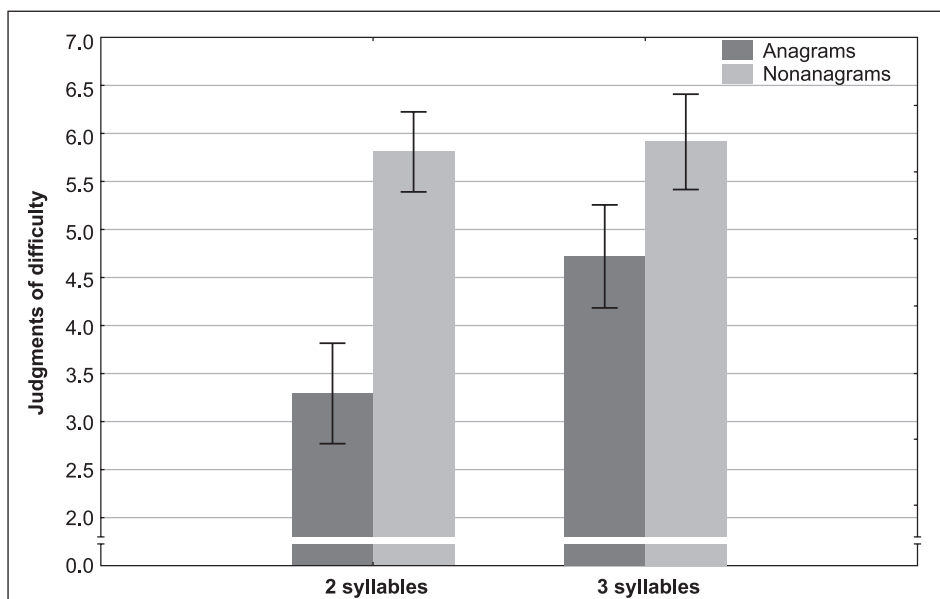


Figure 5 Judgments of difficulty as a function of solvability and item length (spreads represent 95% CI)

In order to determine correlations between metacognitive judgments and performance variables, inter-correlations, seen in Table 2, were calculated. Pearson correlation coefficients were calculated independently for each experimental condition.

The results showed that higher initial judgments of solvability predicted the percentage of correct responses only for longer anagrams, even though this may have proven the case for shorter anagrams as well with a larger sample size and/or item pool.

Lower initial judgments of solvability were a strong predictor of higher judgments of difficulty in every condition except the short non-anagrams. However, the correlation was established in the expected direction and may have reached significance with a larger sample size and/or item pool.

As could be expected, the percentage of correct solutions was predictive of judgments of difficulty for anagrams but not for non-anagrams. The participants with a higher number of correct responses gave lower judgments of difficulty.

The most interesting result was that solution time was not correlated with either of the metacognitive judgments. Faster participants usually provide higher metacognitive judgments of confidence, so it was expected that judgments of solvability would predict time on task and that the time would predict judgments of difficulty.

Table 2 *Pearson correlation coefficients between dependent variables*

2 syllable anagrams	2.	3.	4.
1. JOS	.21	-.24	-.40*
2. Percent correct	-	-.54**	-.73**
3. Solution time		-	.37
4. JOD			-
3 syllable anagrams	2.	3.	4.
1. JOS	.62**	.01	-.83**
2. Percent correct	-	-.16	-.81**
3. Solution time		-	.13
4. JOD			-
2 syllable non-anagrams	2.	3.	4.
1. JOS	.09	.34	-.30
2. Percent correct	-	-.04	.30
3. Solution time		-	.04
4. JOD			-
3 syllable non-anagrams	2.	3.	4.
1. JOS	.06	.32	-.59**
2. Percent correct	-	-.31	.01
3. Solution time		-	-.23
4. JOD			-

* $p < .05$; ** $p < .01$; $df = 25$

JOS = judgment of solvability

JOD = judgment of difficulty

Participant-level correlational analysis is more of an indication of individual differences, so it is common in meta-reasoning research to conduct an item-level analysis. The analysis was conducted and is reported in Table 3 though it should be interpreted with caution since the total item pool consists of only eleven items.

Table 3 *Item-level correlations*

	2.	3.	4.
1. JOS	.78**	-.75**	-.81**
2. Percent correct	-	-.89**	-.79**
3. Solution time		-	.94**
4. JOD			-

** $p < .01$

JOS = judgment of solvability

JOD = judgment of difficulty

As is usual in meta-reasoning research all of the correlations is highly significant, with the unusually high coefficients probably a result of the item pool size. Items for which participants gave higher judgments of solvability were solved correctly in a higher percentage of trials, were accompanied with shorter solution times and lower judgments of difficulty. Items solved correctly in a higher percentage of trials were accompanied by shorter solution times and lower judgments of difficulty. Finally, items with longer solution times were judged as more difficult.

Discussion and conclusion

The goal of this experiment was to determine the influence of anagram solvability and length on performance and metacognitive judgments. As expected, we found a strong overall effect of length on both performance and metacognitive indicators. This is in line with the review by Muncer and Knight (2011) which shows a sharp decline in performance from two-syllable to three-syllable anagrams. For judgments of solvability this effect proved to be simple, regardless of actual solvability. This result means that short exposition was not enough to distinguish between anagrams and nonanagrams, although while not reaching significance, the tendency to judge anagrams as more solvable was evident, especially for longer anagrams. There is a need to expand on these results by increasing item count and sample size in future studies. This pilot study thus does not replicate the findings of Topolinski et al. (2016) for initial metacognitive judgments. It is interesting that while length remained a strong effect for solution correctness, the difference between anagrams and nonanagrams was significant only for longer items. This shows how large an impact length has on the anagram solving process. Participants correctly identified nonanagrams at the same rate as they solved anagrams for the three-syllable items. The decreased effect of solvability was evident on solution times where the difference between anagrams and nonanagrams was significantly stronger for two-syllable when compared to three-syllable anagrams. The most interesting result comes from judgments of difficulty where the effect of solvability was weaker for longer items but was still highly significant. Even though performance was very similar for anagrams and nonanagrams in terms of success rate, the nonanagrams were judged as more difficult. This however, may be due to the difference in solution times rather than a direct distinction between solvable and unsolvable items.

Correlational analysis revealed that judgments of solvability represent the strongest predictor of

difficulty judgments on a participant level. An interesting result is a failure to determine correlations of solution times with either metacognitive judgment. Faster participants did not judge the items as less difficult and those who gave higher judgments of solvability did not spend more time solving the anagrams. There is a trend for nonanagrams which shows that higher judgments of solvability may be correlated with the time on task (Table 2). On the other hand, success rate was expectedly negatively correlated for anagrams while the same was not found for nonanagrams. This is expected due to the nature of problem solving tasks which often have easily confirmable solutions. Anagrams had a solution which lead to lower judgments of difficulty. Nonanagrams, however, retain a high level of uncertainty even when correctly identified as unsolvable thus the pattern of correlations between success rate and metacognitive judgments of difficulty mirrors those found in meta-reasoning research. The item level correlations provide only limited information due to the low number of items used for this experiment but reveal expectedly strong correlations between the dependent variables. Items which were accompanied by higher judgments of solvability were solved at a higher rate, faster and had lower judgments of difficulty. Since the intercorrelations are quite high two suggestions for further research include the increase of the item pool and a regression analysis to better understand mediation effects for item-level relationships.

When considered within the dual-process approach and meta-reasoning framework we can emphasize a few main findings. First, the participants choose the most salient feature of the items to provide initial judgments of solvability. Length seems to be a key and salient feature for generating these early metacognitive representations of the anagram solving task. Further research should follow-up on the anagram solving literature which has already identified many features which influence performance as other possible metacognitive cues for early representations (e.g. pronounceability, syllabic structure, solution word frequency, etc.). These early metacognitive representations seem to play a dominant role in the formation of post-processing metacognitive judgments. Indeed, early metacognitive representations and cues influencing them may have further implications on intermediate metacognitive judgments as well as the choice of problem-solving strategies and other processes. Thus, further research of initial metacognitive representations, which has not been a focus in problem-solving research so far, should feature more heavily in the future. Second, it remains unclear if participants are able to directly distinguish between solvable and unsolvable problems, or if the distinction is mediated by the differences in time on task. From this perspective, an increased item and participant pool would enable in-depth analysis base do on item and response type (for an example from meta-reasoning research see Dujmović & Valerjev, 2018). Just as for reasoning research problem-solving tasks need to be analysed in a more complex manner in order to uncover the relationships among underlying processes. Overall, the results show that manipulating with the heuristics on which participants base their decision has an impact on problem-solving performance and metacognition.

The main limitations of the present study are a limited sample size and number of trials per experimental condition and therefore limited statistical power. We would expect marginal effects to be fleshed out in a more comprehensive study. Future improvements might include a larger sample, additional items, four-syllable anagrams, longer intervals for solvability judgments and manipulating the amount and type of anagram training. As the results of this study suggest, the meta-reasoning processes that are involved in problem solving have its own specific characteristics when compared to other meta-reasoning findings obtained with classical reasoning tasks. For a more complete picture of meta-reasoning processes it is important to continue research on different types of thinking. Multistep problem solving research may provide more insights into similar processes which unite reasoning, problem solving and decision making.

To summarize, both anagram length and anagram solvability proved significant effects on response times and judgments of difficulty. Anagram length also demonstrated a significant effect on accuracy and judgment of solvability. We can conclude that this study shows that meta-reasoning research paradigms may be applied to problem-solving tasks to expand the rich tradition and provide further insight into prob-

lem-solving. The study also highlights the necessity for large item pools and sample sizes in order to go beyond the superficial relationships. This deeper step is required to truly investigate metacognition in problem-solving. Basic findings of mechanisms influencing both metacognitive and problem-solving processes will surely have important implications in numerous settings from metacognitive self-regulation in education to on-line feedback in the performance of many different tasks.

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17

Premature Birth: Social Support as a Predictor of Positive and Negative Aspects of Maternal Well-Being

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Abstract

A birth before the 37th week of pregnancy is considered premature birth. In Croatia, about 2500 children are born prematurely annually, and public awareness of the problems and consequences with which premature infants and their parents meet is extremely low. Prematurely born children are particularly sensitive in their infant age and during early development, which causes their parents to face many challenges. Therefore, the main goal of this research was to determine the level of stress, anxiety and depression in parents of premature children, and the correlations between measures of social support and some aspects of maternal well-being (stress, depression, anxiety, life satisfaction and post-traumatic growth). The study involved mothers with one child that was born prematurely ($N = 164$), at an average age of 33 years. The average age of the prematurely born children were 3 years, they were born 2 months before the term, and they were treated at the neonatal intensive care unit on the average of 44 days. Depression, Anxiety and Stress Scale, Satisfaction with Life Scale, Post-traumatic Growth Questionnaire, and Social Support Scale have been applied. In line with the assumption of the protective role of social support from the negative effects of stress, significant negative relationships of social support of friends and families have been identified with anxiety, depression and stress measures. Consequently, mothers of prematurely born children who are receiving more support from friends and family are more satisfied with life and show more positive changes in personal strength, social relationships and life philosophy. The results of regression analysis show that the perception of depression, stress, anxiety, and life satisfaction mostly benefits from support to self-esteem by friends.

Keywords: premature birth, social support, maternal well being

Introduction

Birth before the 37th week is considered to be a premature birth, and the baby born before the 37th week of gestation is considered a prematurely born baby. Given the gestational age, newborns are divided into: *late premature* babies (born between 34 and 36 weeks), *moderate premature* babies (born between 30 and 33 weeks of age), *very premature* babies (born between 26 and 29 weeks of gestation) and *extreme premature* babies (children born before the 26th week) (Sears, Sears & Sears, 2014; Stanojević, 2011). The survival rate of late and moderate premature babies is between 98-100% and most of these children have no long-term medical problems. According to this research, very premature babies often have immature lungs and there is a risk of long-term medical problems. The survival rate for children in this group is 90%. When it comes to extreme premature babies, 25-50% survive, but more than half will have some form of long-term medical problems (vision problems, neurological deficit, difficulty in learning) (Benjak, 2011). Over the past twenty years the prevalence of premature birth in developed countries has reached 5-7% of all births, and according to data collected in Croatia in 2013 there were 6.2% premature births (2497) of which 236 children died during the perinatal period (Rodin, Đelmiš, & Juras, 2014).

The biological maturation of the baby during pregnancy allows time for the parents to prepare for parenthood (Speilman & Taubman-Ben-Ari, 2009). For the parents of premature children the process of transition to parenthood is suddenly and unexpectedly interrupted, and the process of "*premature parenthood*" begins, which both parents need to adapt to (mothers do not meet the ideal expectations of pregnancy, while fathers, during the adaptation period also take on the role of keeping the family stable). Birth and hospitalization of the infant in neonatal intensive care unit (NICU) is an unnatural environment for parents and a potential source of stress. According to research conducted in Croatia (Kostović Srzentić, Pukljak Iričanin, Grubić, Bogdanić, & Filipović Grčić, 2017), even 50% of the parents were in clinically significant distress and the most stressful dimension in neonatal intensive care unit was parental role alteration. The most common emotional reactions of parents to this unit in hospital include disappointment, guilt, sorrow, depression, hostility, anger, fear, anxiety, helplessness, feeling of failure and loss of self-esteem (Kendall-Tackett, 2009; Kyno et al., 2013; Sears et al., 2014).

Previous research found that women with preterm births experience higher levels of stress than women who deliver at term (Misund, Nerdrum, & Diseth, 2014). Stress related to premature birth can interfere with the establishment of safe attachment between a mother and a premature child after the release from the hospital (Schappin, Wijnroks, Uniken Venema, & Jongmans, 2013). Accordingly, stress and depressive feelings in a mother may be a risk factor for later developmental (behavioural and cognitive) problems in prematurely born infants (Wormald et al., 2015). Since this is an unexpected event that endangers the physical integrity of a mother, but also the child, the premature birth has characteristics of trauma (Dudek-Shriber, 2004; Vanderbilt, Bushley, Young, & Frank, 2009). The experience can lead to symptoms of post-traumatic stress disorder: reliving the birth, avoiding all reminders of birth and increased excitability that manifests itself as insomnia, irritability and reduced tolerance for frustration. The symptoms of trauma (intense fear, helplessness, frightening thoughts, reliving the birth) are present after 6 to 18 months after premature birth in almost 41% of parents (Affleck & Tennen, 1991). Vanderbilt et al. (2009) found that 23% of parents who resided in the neonatology unit meet the criteria for PTSD. Risk factors for developing PTSD are medical complications, the experience of birth, previous traumatic experiences, interaction with medical staff, and length of stay in the intensive care unit (Vanderbilt et al., 2009). Research further show that mothers of premature babies have a higher risk of developing depression than mothers of children born through regular pregnancy (Misund et al., 2014). In addition, the data show that the frequency of postpartum depression in parents of prematurely born babies is about 40% in the early perinatal period, compared to 8-15% in the parents of children that were born from a regular pregnancy. According to the authors Jones, Rowe and Becker (2009), parents of premature babies are

particularly vulnerable in the period after the release from the hospital, when they take full responsibility and care for the child without the help of the medical and other professional staff available at the hospital. With the feeling of happiness that a child leaves the hospital, the mothers feel anxious and unprepared for caring for the child. They have a fear of failure. The *Transactional Model of Stress* (Lazarus & Folkman, 1984) can explain this critical period for parents where the release of premature babies from the hospital is perceived by parents as a threat (primary stress assessment) - parents are more afraid for the child's life when they assume that the responsibility for its care and development is on their own. The perception of threat with the assessment of uncontrollability of the situation (secondary assessment) is related to the mother's stress after the release from the hospital (Jones et al, 2009).

After premature labor, the sense of losing control, insecurity and fear may lead new mothers to feel unsuccessful in their maternal role. Therefore, it is not surprising that mothers of prematurely born children feel greater stress intensity in their parental roles, more pronounced pessimism and health problems, and greater need for social support than mothers who gave birth to healthy children (Martinac Dorčić, 2007). Social support has an important role in the experience of psychological stress and affects both appraisal and coping (Lazarus, & Folkman, 1984). Social support positively affects the person's psychological functioning by altering the cognitive assessment and/or emotional response to a stressful event and helps the person to confront it (Jones et al, 2009). Social support reduces the effects of stressful events through supportive behaviour of others or through perception of accessibility of social support. Most common supportive functions are: emotional support, instrumental support, information support, social support, validation. In general, support behaviours of others increase the effectiveness of coping while the perception of the availability of social support reduces the assessment of the intensity of the potential threat of stress situations (Hudek-Knežević & Kardum, 2005). Weiss and Chen (2002) have confirmed the protective role of social support in parents of prematurely born children. More importantly, significant relationships were established between the social support of the family and friends and the parent's mental health. Research further shows that mothers of prematurely born children show a more pronounced need for social support immediately after discharge from the hospital (e.g. May, 1997). Accordingly, the results of research conducted by Pinneli (2000) show that social support is most accessible in the acute phase of stress or just after delivery and discharge from hospital. Affleck and Tennen (1991) examined the coping strategies used by parents of premature infants while their child was in the hospital. The results showed that the most common coping strategies were mobilizing support and seeking meaning.

Most of the research focused on the negative implications that premature birth has for the psychological functioning of parents. Some new data in this field suggest that premature birth can also contribute to personal growth (Spielman & Taubman-Ben-Ari, 2009).

The term posttraumatic growth describes positive changes after challenging events (Tedeschi, Park, & Calhoun, 1998). Tedeschi and Calhoun's (1995) model highlights that personal, situational, cognitive and social factors are relevant for the explanation of psychological growth. The process of posttraumatic growth is related to individuals' cognitive reconstruction that leads to the adaptation of new reality (Xiaoli et al., 2019). The first research in this field focused on traumatic events, but there are findings (e.g. Sawyer & Ayers, 2009) that imply that growth is not just restricted to traumatic experience. Sawyer, Nakić Radoš, Ayers and Burn (2015) found that 44% and 35% of women from the UK and Croatia, reported a moderate level of growth after childbirth. The results of this study suggested that normative events can also promote growth. Stress associated with premature birth may be a common experience among parents but the ways in which parents cope with the situation may differ. More specifically, with all the difficulties that premature birth carries, parents are more often talking about experiences of positive personal and life changes that lead to greater competence and satisfaction (Speilman & Taubman-Ben-Ari, 2009). It is important to point out that post-traumatic growth does not mean that the symptoms of trauma are gone, but coping with trauma in a new form that improves psychological functioning in specific domains. So, women after childbirth may experience growth independently

of post-traumatic stress symptoms (Sawyer & Ayers, 2009). When experiencing post-traumatic growth, the level of threat is also important, where higher levels of threat are associated with higher growth, which can be explained by the fact that low levels of stress are not enough to endanger the schemes about the world and trigger cognitive and emotional reconstruction (Tedeschi & Calhoun, 1995).

The main goal of the research was to determine the level of stress, anxiety, depression and life satisfaction and post-traumatic growth in mothers of premature children and to determine their relations with measures of social support from family and friends. This research also aimed to determine the contribution of some aspects of social support of family and friends to the maternal well-being. In line with the assumption of stress-protective role of social support from negative effects of stress, significant negative relations of social support of friends and family were expected with anxiety, depression and stress measures. Furthermore, positive relations were expected between social support and measures of life satisfaction and post-traumatic growth. In other words, mothers who receive more social support from friends and family would be more satisfied with life and show more positive changes in their personal strength, social relationships and life philosophy (post-traumatic growth).

Method

Participants

The research involved mothers of only one child who was born prematurely ($N = 164$), and aged 33 on average ($SD = 5.54$, range 20 - 49). The average age of prematurely born child was 3 years ($SD = 3.29$, range 0.08 - 18). On average, the children were born 2 months before the term ($SD = 0.75$, range .075 - 4.25) and spent time in the neonatal intensive care unit 44 days on average ($SD = 47.92$, range 0 - 325). Given the gestational age, the majority of children (40%) were late prematures, 31% moderate prematures, 24% low prematures and 5% extreme prematures. According to mothers' estimates, about 40% of children have some form of developmental difficulties. The most common is motor damage (55% of premature children), then the language difficulties (26%) and sensory integration difficulties (15%), while about 5% of premature children have some form of epilepsy.

When it comes to sociodemographic characteristics, specifically marital status, the majority of women were married (76%) and cohabiting (18%) while the rest were single (3%), in a relationship (2%) or divorced (1%). The majority of women have higher qualifications (58%), while the rest have high school (41%) and primary (1%) qualifications. As far as the financial situation is concerned, and according to their self-report, 69% of the participants have an average income, while 27% think they live better or considerably better than the average. Only about 4% of participants believe they live worse than the average. When it comes to health, the largest number of participants, about 85% of them, according to their self-report, have a good health status, while about 15% of participants believed that they had bad or moderate health status at the time of the research.

Instruments

Depression, Anxiety and Stress Scale (DASS; Lovibond & Lovibond, 1995)
adapted by Reić Ercegovac & Penezić (2012).

The DASS scale consists of the subscale of depression, the subscale of anxiety, and the subscale of stress, each of which has 14 items. Subscale of depression refers to symptoms of dysphoria, hopelessness,

self-defeat, apathy, and a lack of interest. The subscale of anxiety refers to autonomic arousal system and situational anxiety. The subscale of stress includes indicators of chronic, non-specific excitement, difficulties with relaxation, anxiety, impatience, etc. The Cronbach α coefficients for the subscales in this study were: .97 for the subscale of depression, .96 for the subscale of stress and .95 for the anxiety subscale. The respondents have to answer by rounding the appropriate number on the 4-degree estimation scale, 0 - *it does not apply to me*, to 3 - *it completely applies to me*. The overall result is calculated as a linear combination of estimates for each subscale.

Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985).

The scale consists of 5 items; the participants are asked to indicate to what extent the items (e.g. "*My life is very close to what I find ideal*") refer to their lives. The items are rated on 7-point scale ranging from 1 - *I generally disagree* to 7 - *I completely agree with*. The overall result is formed by adding the response estimates for all five items, and indicates the degree of life satisfaction, with higher results pointing to greater satisfaction. In this study, the reliability was satisfactory ($\alpha = .88$).

Social Support Scale (MacDonald, 1998) adapted by Ivanov & Penezić (2010).

The scale includes the perception of receiving social support from family and friends, and relates not only to the potentially available support, but also to the social support that is being actively used. It also includes satisfaction or positive evaluation of social support. It consists of 56 items, 28 of which refer to the social support from the family and 28 to the social support from friends. Each of these two subscales contains four types of social support: *emotional support, instrumental support, informational support, and support to self-esteem*. It is possible to use the result on the total scale or more subscales (depending on the research goals). Ratings are completed on the 5-point assessment scale, and the total result is calculated as a linear combination of responses on all items of the scale, or subscale. A higher score on the scale/subscale suggests a greater social support. Reliability coefficient for both subscales (family social support subscale and friend support subscale) in this study was .97.

Posttraumatic Growth Questionnaire (Tedeschi & Calhoun, 1995) adapted by Malada (2018).

Posttraumatic Growth Questionnaire - measures the degree to which people experience positive psychological changes due to trauma. It consists of 21 items that cover changes in 5 domains (relationships with others, new opportunities, personal power, spiritual changes, respect for the value of life). The participants need to assess on a 5-degree scale the extent to which these psychological changes have occurred due to premature birth - an unexpected event that has trauma characteristics (1 - *I did not experience it*, 5 - *I experienced it completely*). The overall score is determined as a sum of all estimates and ranges from 21 to 105. The Cronbach α coefficient in this study was .98.

Procedure

The research was conducted through online questionnaires. Participants were able to access the questionnaires via links that were shared on the online social network 'Facebook' in groups that support prematurely born children and their parents. Participants were provided with information about the study and they could withdraw at any time. The research was completely anonymous, and all data were recorded in the common table on the web site www.docs.google.com, which only researchers had access to.

Results

Levels of positive and negative aspects of maternal well-being

For anxiety variables, depression and stress, the distribution of results was shifted to lower values. The distribution of results of social support measures was shifted to higher values - mothers of premature children perceive a high level of social support by family and friends. The distributions of post-traumatic growth and life satisfaction are also negative asymmetric - mothers of premature children are generally satisfied with their lives and experience positive changes after childbirth. Around 69.5% of the mothers reported at least a moderate degree of positive change (>62¹ on posttraumatic growth) following a premature birth.

Table 1 *Basic descriptive statistics of individual measures used in this research (N=164)*

	<i>M</i>	<i>SD</i>	Min	Max
Depression	7.75	10.35	0	42
Anxiety	9.75	10.44	0	42
Stress	15.01	11.28	0	42
Life satisfaction	3.63	.91	1	5
Post-traumatic growth	68.74	29.65	0	105
<i>Support from family</i>				
Emotional family support	29.87	6.29	7	35
Self-esteem family support	27.79	6.02	7	35
Informational family support	29.46	6.31	9	35
Instrumental family support	29.36	5.42	11	35
<i>Support from friends</i>				
Emotional friend support	29.27	5.77	7	35
Self-esteem friend support	28.37	5.31	10	35
Informational friend support	28.92	5.89	10	35
Instrumental friend support	27.61	5.79	8	35

The results on the scales of depression, anxiety and stress in this research were compared with the results of pregnant women and mothers with children up to one year of age (Reić Ercegovac & Penezić, 2012). The results of these comparisons are shown in Table 2. By comparing the results, it can be seen that mothers of premature children show a significantly higher degree of depression, anxiety and stress than the average population of healthy adults (Lovibond & Lovibond, 1995) and in relation to pregnant women and mothers with children younger than 1 year.

The analyses of demographic (maternal age) and childbirth variables (child's age, gestational age at birth, the presence of the developmental difficulties) found no significant associations between these variables and depression, anxiety, stress and life satisfaction variables, with the exception of the presence of the developmental difficulties (yes/no) which was associated with life satisfaction ($r = .23, p < .05$). Mothers

1 Sawyer et al., (2015)

whose children have no difficulties are more satisfied with life. Posttraumatic growth is negatively associated with gestational age ($r = -.18, p < .05$).

Table 2 Comparison of mothers of premature children in depression, anxiety and stress versus "adult population" and "general perinatal women"

	Adult population ($N=2914$) ²	"General perinatal women" ($N=108$) ³	Mothers of premature children ($N=164$)	$t(df)$ (Mothers of prematures / norms)	$t(df)$ (Mothers of premature/"general perinatal women")
	$M(SD)$	$M(SD)$	$M(SD)$		
Depression	6.34 (6.97)	4.4 (6.38)	7.75 (7.71)	2.35 (163)*	5.58 (163)**
Anxiety	4.7 (4.91)	5.94 (5.29)	9.75 (10.44)	6.23 (163)**	4.70 (163)**
Stress	10.11 (7.9)	11.33 (7.2)	15.01 (11.28)	5.56 (163)**	4.18 (163)**

* $p < .05$; ** $p < .01$

Social support in relation to maternal well-being

The Table 3. consists of inter-correlations between individual aspects of psychological functioning and social support from family and friends. As can be seen, significant negative correlations have been identified for all aspects of social support of family and friends (emotional support, self-esteem support, information and instrumental support) with depression, anxiety and stress. Accordingly, mothers of premature children who perceive more social support by family and friends are less depressed, anxious, and perceive lower levels of stress.

Support from friends (all aspects) and instrumental support from family were significantly and positively associated with the levels of growth. Life satisfaction was associated with both family and friends support. As a result, mothers of prematurely born children who receive more support from friends and family are more satisfied with life.

Table 3 Correlations between certain measures of psychological functioning and social support

	Depression	Anxiety	Stress	Life satisfaction	Post-traumatic growth
1. Emotional <i>family</i> support	-.41**	-.35**	-.28**	.49**	.12
2. Self-esteem <i>family</i> support	-.38**	-.34**	-.29**	.48**	.09
3. Informational <i>family</i> support	-.32**	-.26**	-.19*	.44**	.14
4. Instrumental <i>family</i> support	-.37**	-.33**	-.25**	.43**	.21**
5. Emotional <i>friend</i> support	-.43**	-.39**	-.34**	.46**	.20**
6. Self-esteem <i>friend</i> support	-.46**	-.43**	-.39**	.48**	.20**
7. Informational <i>friend</i> support	-.36**	-.33**	-.27**	.41**	.20**
8. Instrumental <i>friend</i> support	-.38**	-.34**	-.31**	.41**	.18*

* $p < .05$; ** $p < .01$

2 Lovibond and Lovibond (1995)

3 Reić Ercegovic and Penezić (2012).

The following passage contains the results of standard regression analysis with some aspects of social support as predictors and the perception of some aspects of psychological functioning as criteria (depression, anxiety, stress, life satisfaction and posttraumatic growth). As can be seen in Table 4, the social support from family and friends, together explains about 30% of depression variance, 26% of anxiety variance, and 23% of stress variance in a sample of mothers of premature children. When it comes to positive aspects of psychological functioning, the social support of family and friends explains about 33% of life satisfaction variance, and only 9% of the post-traumatic growth variance.

The perception of depression, stress and anxiety is mostly contributed by support to self-esteem by friends. Mothers of premature children who are more satisfied with the self-esteem support from friends are less depressed and anxious, and experience lower levels of stress. Emotional support from the family is a positive predictor of depression. Mothers of premature children who receive more emotional support from their family are less depressed.

Furthermore, self-esteem support is a positive predictor of life satisfaction, meaning that the support from friends who have important information relevant to self-evaluation contribute to a greater life satisfaction. The perception of instrumental family support is the only positive predictor of post-traumatic growth, that is, there is a higher probability of post-traumatic growth in mothers of premature children who receive more concrete help from their own family.

Table 4 *The results of standard regression analysis with the characteristics of social support as predictors and some aspects of psychological functioning as criteria (N=164)*

	Depression	Anxiety	Stress	Life satisfaction	Post-traumatic growth
	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
1. Emotional <i>family</i> support	-.47** (.22)	-.39 (.22)	-.37 (.23)	.29 (.21)	-.32 (.25)
2. Self-esteem <i>family</i> support	-.13 (.15)	-.21 (.16)	-.22 (.16)	0.16 (.15)	-.14 (.17)
3. Informational <i>family</i> support	.43 (.20)	.54 (.21)	.50 (.22)	-.13 (.20)	.18 (.23)
4. Instrumental <i>family</i> support	-.09 (.13)	-.16 (.14)	-.06 (.14)	.05 (.13)	.35** (.15)
5. Emotional <i>friend</i> support	.04 (.21)	.08 (.22)	.11 (.23)	-.06 (.20)	.02 (.25)
6. Self-esteem <i>friend</i> support	-.56** (.19)	-.58** (.19)	-.64** (.20)	.41** (.19)	.11 (.22)
7. Informational <i>friend</i> support	.33 (.19)	.26 (.20)	.40 (.20)	-.13 (.19)	.15 (.22)
8. Instrumental <i>friend</i> support	-.10 (.13)	-.03 (.13)	-.12 (.14)	.09 (.13)	-.08 (.15)
	$R^2=.30$ $F(8,15)=8.40$ $p<.001$	$R^2=.26$ $F(8,15)=7.12$ $p<.001$	$R^2=.23$ $F(8,15)=5.69$ $p<.001$	$R^2=.33$ $F(8,15)=9.57$ $p<.001$	$R^2=.09$ $F(8,15)=1.89$ $p<.001$

* $p<.05$; ** $p<.01$

Discussion

Although the number of prematurely born children in Croatia is increasing (Stanojević, 2016), there is a lack of research on the psychological functioning of their parents. Birth and hospitalization of prematurely born children inevitably lead to emotional stress that is prolonged even during the early years of a child's life.

The aim of the research was to determine the level of stress, anxiety and depression in mothers of prematurely born children, and to determine the relationship between some aspects of social support with maternal well-being (stress, depression, anxiety, life satisfaction, post-traumatic growth). Since a non-clinical population of mothers of premature children participated in this research, the data of descriptive analysis are not surprising, according to which mothers of prematurely born children experience relatively low levels of depression, stress and anxiety. However, although data is only descriptive, the results of this research show that mothers of premature children have a significantly higher degree of depression, anxiety and stress than the population of healthy adults on average (Lovibond & Lovibond, 1995) and in relation to pregnant women and mothers with children up to one year old (Reić Ercegovic & Penezić, 2012). The birth of a preterm child may be stressful due to medical complications and potential long term effects of prematurity. The results in the present study and are in line with previous findings in this field (Gambina et al., 2011; Ghorbani et al., 2014; Zanardo, Volpe, Maione, Giustardi, & Straface, 2014) and indicate that mothers of preterm children are at increased psychological risk in the critical period for the establishment of a good mother-infant relationship. The results of this research could be explained by the fact that participants in this research were mothers whose children have developmental difficulties (40% of prematurely born children have some form of developmental problems). The greatest source of stress, especially for the mother, is daily care and treatments (Ljubešić, 2004). Physiotherapy programs and treatments that stimulate overall development, sometimes lead to neglect of the child's basic needs such as warmth and closeness. Namely, in order to create the best development outcomes in the future, the basic needs of the child are sacrificed since the parents primarily have the therapeutic role (Ljubešić, 2004). A methodological explanation for the difference in stress levels is also possible. It may be that only mothers who were still occupied with NICU experience participated in this study (selection bias).

Regarding the results on posttraumatic growth, it is interesting that mothers of premature children in this study are experiencing positive changes after premature labour. The comparison with previous findings suggests that the level of growth after premature birth is higher to those reported after regular childbirth (Sawyer & Ayers, 2009; Sawyer et al., 2015). Although both normative (the birth of a full term child) and stressful events (the birth of premature child) can promote growth, it is possible that a more stressful situation contributes to a higher sense of growth. This is also confirmed by the results of correlation analyses where it was obtained that posttraumatic growth in mothers is negatively associated with gestational age of the child and positively with the days the child spent in the neonatology department ($r = -.21, p < .01$). In summary, stressful circumstances of premature birth and taking care of premature child enable stress-related growth in mothers of premature children. The results of this research are also in line with some previous findings where mothers of premature infants reported higher levels of growth than mothers of either full-term singletons or twins (Spielman & Taubman-Ben-Ari, 2009; Taubman-Ben-Ari, Findler, & Kuint, 2007). The results from the present study indicate that premature birth despite high levels of stress may also result in positive psychological changes which was confirmed by positive correlations of posttraumatic growth and life satisfaction ($r = .23, p < .01$). These findings are even more important if it is considered that there were no studies in Croatia that linked post-traumatic growth with premature birth experience.

Parents of prematurely born children immediately after the birth enter a specific life period that characterizes the processes of accepting the diagnosis, the burden for child's development and growth, fre-

quent visits to doctors, long and demanding rehabilitation processes. For a parent to be successful in his/her role, social support is very important, primarily because of the feeling that in crisis and stressful situations he/she can count on advice, information, material help, or understanding of other people (Laklija, Milić Babić, & Lazaneo, 2016). In this research, the focus was on four types of social support: emotional (giving or receiving love, care and trust), instrumental (providing specific help), informational (advice used to face personal and environmental problems) and self-esteem support (support from persons who have information relevant to self-evaluation) from two different sources; support from family and support from friends. Social support in the stress process has more functions: it can reduce stress experience, it can affect coping strategies and thus modify the relationship between stress and stress outcomes, as well as directly affect the level of adjustment (Hudek- Knežević & Kardum, 2005; Ivanov & Penezic, 2010; Jones et al., 2009; Lazarus & Folkman, 1984).

One of the problems of this research was to determine the correlations of some aspects of social support (emotional support, self-esteem support, informational and instrumental support) with measures of maternal well-being (stress, depression, anxiety, life satisfaction and post-traumatic growth). In line with the assumption of the protective role of social support, mothers of prematurely born children who perceive more social support by family and friends are less depressed, anxious, and perceive lower levels of stress. Furthermore, life satisfaction was associated with both family and friends support. In post-traumatic growth, however, the role of social support by friends is more important (although there are low correlations). When it comes to the results of regression analysis, the perception of depression, stress, anxiety, and life satisfaction is mostly influenced by self-esteem support from friends. Accordingly, mothers who receive more self-esteem support from their friends are more satisfied with their lives, less depressed and anxious, and perceive lower levels of stress. Previous studies have also confirmed that social support contributes to greater self-esteem and perceptions of self-efficacy resulting in reducing the intensity of negative emotional reactions (Teti & Gelfand, 1991). With self-esteem support, emotional support of the family has also been important when it comes to depression. These findings are in line with the findings of research conducted by Weiss & Chen (2002), where a significant relationship between the social support of family and friends with mental health was identified in mothers of prematurely born children. In particular family cohesion, emotional support and a mother's satisfaction with her family contributed positively to her mental health. Previous studies showed that social support was more important for mothers of premature infants than for mothers of full-term infants. More specifically, the lack of social support predicted maternal distress only in mothers of premature infants (Singer, Davillier, Bruening, Hawkins, & Yamashita, 1996). The study conducted by Pinneli (2001) found that social support (from family and friends) was strongly associated to positive adjustment and decreased stress that were either coping or being a first-time parent. Maternal perceptions of poor social support in previous studies were associated to depressive symptoms and higher distress in mothers of sick children (Jessop, Riessman, & Stein, 1990) as well as postpartum women.

The contribution of this research is that it established that of four types of social support (family and friends), the self-esteem support of friends was the most important one. Since the transition to the so-called "preterm parenting" was characterized by emotions of fear, anxiety, helplessness, feelings of failure, and loss of self-esteem, social support focused on self-esteem is essential for parental competence as well as their psychological functioning (Keen, Couzens, Muspratt, & Rodger, 2010). Apart from helping to overcome the challenges of parenting, support to parents of prematurely born children also increases the likelihood that the parents will treat the children in a way that supports their optimum psychosocial development (Ljubešić, 2014). In this regard, the role of friends and the quality of social interaction is particularly emphasized.

According to previous data, younger age, internal locus of control, personality traits, trauma type

and ways of coping are the most relevant correlates of post-traumatic growth (Malada, 2018; Xiaoli et al., 2019). Previous research has also indicated that social support has a significant effect on an individual's ability to perceive benefits following a challenging event (Tedeschi & Calhoun, 1995). In this study, support from friends was significantly and positively associated with levels of growth but only the perception of instrumental support of the family was outlined as a positive predictor. This finding provides support to the importance of supportive relationship with family after premature birth and highlights the role of instrumental help. Social support explains only 9% of the post-traumatic growth. These results are consistent with studies that found a positive association between growth and support (Kinsinger et al., 2006), but despite that 90% of the variance in growth scores remained unaccounted for. This means that more research is needed to clarify other predictors of growth in premature mothers. In previous studies it was shown that the important factors of post-traumatic growth in premature mothers were: the level of threat or stress associated with the length of stay in the hospital, gestational weeks of premature children. Besides the trauma characteristics, some personal characteristics of the parent (personality traits, attachment style) and child (e.g. temperament) (Speilman & Taubman-Ben-Ari, 2009) also proved to be important. Positive correlations were found between the support of grandmothers and the personal growth of mother's (Rozen, Taubman-Ben-Ari, & Strauss, 2017).

The results of this study must be interpreted with several methodological limitations. The correlational design constraints causal inferences regarding the relationship between social support and maternal well-being. The study was conducted on self-selected and highly educated sample (where almost 50% of the mothers of premature children had high qualifications and over 90% estimated that they lived on average or better than the average). The study focused only on support from family and friends; it would be therefore necessary to determine the role of perceived spouse's emotional support. Fathers should be involved in future studies as well as parents who have two or more premature children. Finally, apart from preterm delivery, perinatal complications and social support, there are also other variables that influence maternal well-being that were not measured in this study e.g. some personal characteristics (personality traits, self-esteem, religiosity, coping strategies, individual's basic belief system, mental flexibility), maternal physical health, working status and satisfaction with marriage and work.

Although the data can not be generalized, this research draw attention to the challenges of parenting in the mothers of premature children as well as possible implications for their well-being. This research has shown that informal social support of family and friends plays a vital role in coping with stress among the parents of prematurely born children. Most of today's research focuses on the negative implications that the premature birth has for the psychological functioning of parents. Moreover, data from this research suggest that premature birth can also contribute to positive change in one's beliefs and functioning. Future research should certainly systematically address the specific experiences of parents related to premature birth in order to gain a better insight into their needs and to find adequate support systems important to children and the family. In addition, besides the system of informal support, it is also important to use formal (in the view of a variety of experts) support that should strengthen parents for the care and nurturing of their children after leaving the hospital, or during the child's development. There is a need for longitudinal research that would include parents' experience immediately after birth, and then six or twelve months later. This could provide a better insight into parenting challenges in different critical periods for parents, but would also help evaluate the quality of the available formal and informal support. Unfortunately, the problems encountered by parents of premature children are not sufficiently recognized by the society, and there is often a lack of support from experts (psychologists, social workers and other professionals from related areas) (Laklija et al., 2015). For these reasons, the association "*Preterm Infants Parents Association*" was founded in Croatia for assistance, support and education of parents of prematurely born children.

Conclusion

Mothers of prematurely born children had more symptoms of depression, anxiety and stress compared to the population of healthy adults. Significant negative correlations have been identified for some aspects of social support from family and friends (emotional support, self-esteem support, informational and instrumental support) with measures of depression, anxiety and stress. The opposite pattern of correlation was obtained with measures of life satisfaction and post-traumatic growth. Regression analysis found that the perception of depression, stress, anxiety, and satisfaction with life is mostly contributed by self-esteem support from friends. As a negative predictor of depression, emotional support of the family was also highlighted, while a significant positive predictor of post-traumatic growth was the instrumental support of the family.

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18

Personality Traits, Job Satisfaction and Organizational Justice as Determinants of Burnout in Teachers

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Abstract

The objective of this study was to determine whether personality traits, job satisfaction, and organizational justice are associated with burnout in teachers. The sample was composed of 554 teachers (77.3% females) from 25 Bosnia and Herzegovina elementary schools. We used Big Five Inventory (John, Donahue, & Kentle, 1991), Job Satisfaction Scale (Brayfield & Rothe, 1951), Organizational Justice Scale (Colquitt, 2001) containing four subscales: Distributive justice, Procedural justice, Interpersonal justice and Informational justice, and Copenhagen Burnout Inventory (Kristensen, Hannerz, Høgh, & Borg, 2005) containing four subscales: Personal burnout, Work-related burnout and Student-related burnout. The results show that personal traits, job satisfaction, and distributive justice are associated with personal, work-related and student-related burnout. Neuroticism, job satisfaction, and distributive justice make a significant contribution to personal, work-related and student-related burnout. The openness to experience provides a significant contribution to work-related and student-related burnout, and agreeableness makes a significant contribution to personal burnout.

Keywords : personality traits, job satisfaction, organizational justice, burnout, teachers

Introduction

Burnout was established in the psychological literature in the mid-1970s. Herbert Freudenberg defined burnout as a gradual loss of motivation and emotional "exhaustion" due to the specific requirements of work, personality traits, and expectations, as well as unsatisfactory results of the invested efforts, observed in the medical staff who dealt with addicts (Schaufeli & Buunk, 2003). Several years later, Maslach and Jackson (1981) extended the term burnout to involve emotional exhaustion, depersonalization, and reduced personal accomplishment, characteristics that fit humanistic and helping professions better. Recently, as part of the PUMA study on burnout among human service employees in Copenhagen, the Copenhagen Burnout Inventory (CBI) was created (Kristensen, Borritz, Villadsen, & Christensen, 2005). The CBI consists of three dimensions which assess: personal burnout, work-related burnout and client-related burnout (Kristensen et al, 2005). The personal burnout dimension is defined as "the extent to which the person experiences physical and psychological fatigue and exhaustion" (Kristensen et al., 2005, p. 197). Client-related burnout is "the degree of physical and psychological fatigue and exhaustion that the individual perceives as having to do with his/her job with clients" (Kristensen et al., 2005, p. 197). Work-related burnout is described as "the degree of physical and psychological fatigue and exhaustion that the individual perceives as having to do with his/her job" (Kristensen et al., 2005, p. 197). The CBI was also used in our research.

Factors that influence burnout can be classified into personal and situational factors. Situational factors include workplace conditions, such as workload level or lack of support from colleagues. Situational factors include the features of the workplace, such as workload level or lack of support from colleagues (Dedić, 2005). Studies indicate that neuroticism is positively correlated (Buhler & Land, 2003; Hills & Norvell, 1991; Langelaan, Bakke, Lorenz, & Van Doornen, 2006), while extraversion is negatively correlated with burnout (Bakker, Van Der Zee, Lewig, & Dollard, 2006; Lakin, Leon, & Miller, 2007; Langelaan et al., 2006). In addition, studies show that employees younger than 35, single, without children and with less work experience, are exposed to a higher risk of burnout. (Demirci et al., 2010). Moreover, studies indicate that job satisfaction is negatively correlated with burnout (Schaufeli, Taris & Van Rhenen, 2008; Sonnentag, 2003). Many researchers (Lee & Ashforth, 1996; Maslach & Schaufeli, 1993; Miller & Ellis, 1990) emphasize that situational factors, like the nature of the work and circumstances under which the work is done, represent the main triggers for the burnout development. The results of existing research generally indicate that burnout is more determined by situational than personal factors (Dedić, 2005).

Burnout impacts the quality of a person's life through three components: emotional, cognitive and behavioural, and it manifests itself through the interactions in a person's private life, but also in the work environment. People suffering from burnout syndrome are susceptible to depression, alcohol abuse and suicide (Lindblom, Linton, Fedeli, & Bryngelsson, 2006; Michielsen, Willemsen, Croon, De Vries, & Van Heck, 2004). Furthermore, burnout is associated with absenteeism, decreased productivity and increased willingness to leave the workplace (Polikandrioti, 2009).

Professions that are constantly interacting with clients (e.g. call center operators), but also helping professions (e.g. health workers, teachers) are at the greatest risk of burnout (Maslach, Schaufeli & Leiter, 2001). The teacher's burnout is becoming an increasingly frequent subject of research interests (Živčić-Bećirević & Smojver-Ažić, 2005; Tatalović Vorkapić & Lončarević, 2013). Today's teaching profession is characterized by a series of changes and challenges that increase the complexity and job requirements of teachers. On the one hand, many reforms in the educational system bring teachers an increased number of administrative tasks, and on the other hand, changes in the curriculum also require additional preparation. Furthermore, with rapid technological advances, teachers also encounter challenges in the way of teaching.

Understanding the mechanism of teacher burnout and recognizing factors that are influencing the teacher's burnout we create an opportunity for preventive action. In our country, a number of studies deal-

ing with the teacher's burnout are still rather low, and the prevention program is almost non-existing in practice. Therefore, this study examines the relations between personality traits of the Big Five model, job satisfaction, organizational justice, and the teacher's burnout. Specifically, the aim of this study is to examine to what extent the teacher's burnout can be explained by the personality traits of the Big Five model, job satisfaction and organizational justice.

The Five-Factor Model of Personality is a comprehensive taxonomy of personality traits (McCrae & Costa, 1990). It assumes that the space of the basic personality structure can be described along five dimensions: Extraversion, Conscientiousness, Agreeableness, Openness to Experience and Neuroticism. The Five-Factor Model of Personality was also used in our research. Extraversion relates to the degree of active involvement of a person in their social environment. Characteristics associated with extraversion are activity, sociability, and adventure (McCrae & Costa, 1990). Conscientiousness relates to the degree to which a person follows social norms and goal-oriented behaviour. Responsibility, deliberateness, commitment to achievement, need for control and organizing are characteristics associated with conscientiousness (McCrae & Costa, 1990). Agreeableness refers to the extent to which an individual exhibits cooperation with and trust in others. Characteristics associated with agreeableness are kindness, cooperation, and unselfishness (McCrae & Costa, 1990). Openness to experience relates to the degree of acceptance of fresh or unconventional ideas and experiences by a person. Characteristics associated with openness to experience are imaginativeness, curiousness, and foresightedness (McCrae & Costa, 1990). Neuroticism is related to an individual's emotional stability and adaptation. Neuroticism is generally seen as a lack of positive psychological adaptation and emotional stability (Judge, Higgins, Thoresen, & Barrick, 1999; Emmons, Diener & Larsen, 1985). Characteristics associated with neuroticism include anxiety, hostility, anger (McCrae & Costa, 1990). Having in mind that people with high scores on neuroticism are more prone to define many situations as dangerous and also use a non-adaptive stress coping strategies (Storm & Rothmann, 2003; Magnano, Paolillo & Barrano, 2015), and that working with children in their process of growing up is challenging and full of various frustrations and obstacles, we expect that teachers with high scores on neuroticism are more prone to burnout.

Job satisfaction is defined as a positive emotional state resulting from the assessment of the individual's work, or his/her work-related experiences (Locke, 1976). Job satisfaction has significant outputs in productivity, absenteeism and fluctuation of employees. Having in mind the fact that job dissatisfaction is linked to a higher probability of the expression of emotional exhaustion (Ogresta, Rusac & Zorec, 2008), which, in turn, is at the root of burnout (Maslach, Schaufeli, & Leiter, 2001), we expect the teachers with lower scores in job satisfaction to be more prone to burnout.

Organizational justice refers to the employee's perception of justice in various aspects of the organizational functioning (Greenberg, 1987). Colquitt's (2001) model of organizational justice is an economical and valid measure of organizational justice (German, 2011; Shibaoka et al., 2010), and was used in this research. This model implies the existence of four components of organizational justice: distributive justice, procedural justice, interpersonal justice and informational justice (Colquitt, 2001). Distributive justice refers to fairness in the distribution of outcomes such as salaries, rewards, benefits, and promotions (Colquitt, 2001). Procedural justice refers to the fairness of organizational policies and procedures used in making decisions regarding the distribution of rewards (Colquitt, 2001). Interpersonal justice includes the motivation, respect, and dignified treatment of employees by their superiors in the organization (Colquitt, 2001). Informational justice implies the perception of justice in the communication aspect of organizational procedures (Colquitt & Jackson, 2006). Fejgin, Ephraty, and Ben-Sira (1995) emphasize that low salaries, bureaucratic constraints, and job limitations are the most relevant three factors to job burnout. Lambert et al. (2010) found that distributive justice and procedural justice have a significant negative relationship with burnout. Brotheridge (2003) noted that perceptions of distributive and procedural justice decreased work-

ers' emotional exhaustion. Zahrani (2010) found that distributive justice, procedural justice, and interactive justice could predict 30% of burnout of employees. Having in mind the findings of the above-mentioned studies, we expect the teachers with the organizational injustice experience to be more prone to burnout.

Researching factors that contribute to the teacher's burnout is important in order to understand the mechanism of teacher's burnout and open up space for preventive action.

Material and Methods

Participants and procedure

A convenience sample was used in this study. The sample consisted of 554 teachers (77.3% females) from 25 Bosnia and Herzegovina elementary schools. Concerning the location of the school, 64.1% of them were placed in the city, 13.7% in the suburb, and 22% in the rural area. There were 45.1% of class teachers and 54.9% of the subject teachers who took part in this study. Participants were aged 23 to 66 ($M = 39.76$, $SD = 9.48$). In terms of the work experience, the sample was divided into four cohorts: up to 5 years of service (22%), 6-15 (41.5%), 16-25 (23.6%) and more than 26 (12.9%).

The data were collected in schools using a paper-and-pencil questionnaire format, under the supervision of the researchers. The participants filled out the questionnaires in groups. The participants needed approximately 35 minutes to complete it. The participants were notified that the collected data will be used for scientific purposes only. Participation was voluntary. The data were collected on anonymous survey sheets in order to guarantee the participant's anonymity.

Measures

Copenhagen Burnout Inventory – CBI (Kristensen, Borritz, Villadsen & Christensen, 2005). The questionnaire consists of 19 questions distributed in three sub-scales that measure components of burnout: personal burnout (e.g. "How often do you feel tired?"), work-related burnout (e.g. "Do you feel worn out at the end of the working day?"), and student-related burnout (e.g. "Are you tired of working with pupils?"). Participant used a five-point Likert type scale (from 1- never to 5 - almost always) to assess how often they feel in a way that was described in particular statement. A higher score on the scale indicates a higher level of a specific aspect of burnout. For this study, Cronbach's Alpha was .84 for the personal burnout scale, .84 for the work-related burnout scale and .80 for the student-related burnout scale.

Big Five Inventory – BFI (John, Donahue & Kentle, 1991). The questionnaire contains 44 items distributed in five sub-scales that measure personality traits: Extraversion (e.g. "I see myself as someone who is talkative."), Agreeableness (e.g. "I see myself as someone who is helpful and unselfish with others."), Conscientiousness (e.g. "I see myself as someone who is a reliable worker."), Neuroticism (e.g. "I see myself as someone who can be tense."), and Openness to experience (e.g. "I see myself as someone who is curious about many different things."). The items are formulated as short phrases based on the adjectives of traits that are the prototypes of the Big Five model. The participants' responses to the BFI are given on a 5-point Likert type scale from 1 (1 – *strongly disagree*) to 5 (5 – *strongly agree*). A higher score on the scale indicates a higher level of specific personality traits. For this study, Cronbach's alpha was .81 for the extraversion scale, .70 for the agreeableness scale, .85 for the conscientiousness scale, .82 for the openness scale and .73 for the neuroticism scale.

Job Satisfaction Scale – JSC (Brayfield & Rothe, 1951). The questionnaire consists of 18 items (e.g. "I enjoy my work more than my leisure time.") that measure job satisfaction. The participants' responses to the

JSS are given on a 5-point Likert type scale from 1 (1 – *strongly disagree*) to 5 (5 – *strongly agree*). A higher score on the scale indicates greater job satisfaction. For this study, Cronbach’s Alpha was .85.

Organizational Justice Scale – OJC (Colquitt, 2001). The scale consists of 20 items distributed in four sub-scales that measure components of organizational justice: distributive justice (e.g. “My compensation level reflects the effort I put into my work.”), procedural justice (e.g. “The procedures used to arrive compensation level are applied consistently.”), interpersonal justice (e.g. “My supervisor treated me with respect.”), and informational justice (e.g. “My supervisor is candid in communications with me.”). The participants’ responses to the OJC are given on a 5-point Likert type scale from 1 (1 – *completely disagree*) to 5 (5 – *completely agree*). A higher score on scales indicates a higher level of a specific aspect of justice. For this study, Cronbach’s alpha was .90 for the distributive justice scale, .87 for the procedural justice scale and .94 for the interpersonal justice scale, .94 for the informational justice scale.

Demographic checklist. The questionnaire designed for this research consisted of five questions about the following demographic characteristics: gender, age, length of service, position and placement of the school.

Data analysis

In data analysis the following statistical procedures were used: descriptive statistics, correlation analysis, and hierarchical regression analysis. Data analysis was performed using the statistical software package SPSS for Windows, version 20.0.

Results

Table 1 presents descriptive indicators for the variables used in the study. The data from Table 1 shows that respondents’ results at the sample level are shifted to higher values for the extraversion, agreeableness, conscientiousness, neuroticism, openness, job satisfaction, distributive justice, interpersonal justice and informational justice. Distribution of the respondents’ results related to extraversion, conscientiousness, and openness is platykurtic, which implies there is a tendency of results dispersion on the mentioned scales. Respondents’ results for personal burnout, work-related burnout, student-related burnout, neuroticism, and procedural justice are shifted to lower values. Distribution of respondents’ results on the scale procedural justice is platykurtic, which indicates a tendency of results dispersion on this scale (George & Mallery, 2010; Gravetter & Wallnau, 2014).

Table 1 *Descriptive statistical measures for variables used in the study*

	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>Skewness (SE)</i>	<i>Kurtosis (SE)</i>
Personal burnout	6	28	13.54	3.82	.41 (.10)	.20 (.21)
Work-related burnout	7	31	14.17	4.51	.74 (.10)	.49 (.21)
Student-related burnout	6	28	13.37	3.99	.52 (.10)	.12 (.21)
Extraversion	12	40	29.60	5.17	-.10 (.10)	-.27 (.21)
Agreeableness	18	45	35.54	4.66	-.69 (.10)	.85 (.21)
Conscientiousness	20	45	36.78	5.17	-.50 (.10)	-.18 (.21)
Neuroticism	8	39	20.87	4.70	.14 (.10)	.41 (.21)

Openness	18	50	37.33	5.76	-.22 (.10)	-.06 (.21)
Job satisfaction	43	89	72.24	8.68	-.51 (.10)	.09 (.21)
Distributive justice	4	20	11.89	3.34	-.37 (.10)	.24 (.21)
Procedural justice	7	35	18.81	5.94	.12 (.10)	-.38 (.21)
Interpersonal justice	4	20	17.10	3.36	-1.33 (.10)	1.86 (.21)
Informational justice	5	25	20.99	4.04	-1.14 (.10)	1.42(.21)

Since the primary aim of this study was to determine the contribution of the personality traits of Big Five model, job satisfaction, and organizational justice in explaining the burnout of teachers, prior to the implementation of regression analysis, we calculated a series of Pearson correlation coefficients. The obtained values of correlation coefficients are shown in Table 2.

Table 2 *Correlations between predictor (personality traits of Big Five model, job satisfaction, organizational justice) and criterion variables (burnout)*

	A	C	N	O	JS	DJ	PJ	INTJ	INFJ	PB	WB	SB
E	.22*	.40**	-.29**	.45**	.27**	-.02	-.03	.14**	.16**	-.15**	-.14**	-.13**
A	-	.47**	-.31**	.38**	.38**	.05	.05	.24**	.24**	-.16**	-.19**	-.21**
C		-	-.37**	.38**	.41**	-.01	.01	.14**	.19**	-.24**	-.23**	-.22**
N			-	-.26**	-.27**	-.09*	-.04	-.06	-.06	.39**	.31**	.26**
O				-	.26**	-.04	-.07	.09*	.10*	-.07	-.05	-.07
JS					-	-.02	-.03	.14**	.16**	-.54**	-.60**	-.64**
DJ						-	.05	.24**	.24**	-.18**	-.18**	-.20**
PJ							-	.14**	.19**	-.14**	-.12**	-.14**
INTJ								-	-.06	-.16**	-.16**	-.18**
INFJ									-	-.54**	-.60**	-.64**
PB										-	.85**	.77**
WB											-	.81**

Note: E = Extraversion; A = Agreeableness; C = Conscientiousness; N = Neuroticism; O = Openness; JS = Job satisfaction; DJ = Distributive justice; PJ = Procedural justice; INTJ = Interpersonal justice; INFJ = Informational justice; PB = Personal burnout; WB= Work-related burnout; SB = Student-related burnout; * $p < .05$; ** $p < .0$

Correlation coefficients between predictor and criterion measures are in line with our expectations. Correlations between the personality traits of Big Five model: extraversion, agreeableness, and conscientiousness and burnout are negative and of low intensity (Cohen, 1988), while correlations between the neuroticism and burnout are positive and of low to moderate intensity. Correlations between job satisfaction and burnout, and organizational justice and burnout are negative and of large intensity.

The obtained correlations between the predictor variables are also in line with expectations. Correlations between extraversion, agreeableness, conscientiousness, neuroticism and job satisfaction are

positive and of low to moderate intensity, while the correlation between openness and job satisfaction is negative and of low intensity. Neuroticism is in low negative correlation with distributive justice, while extraversion, agreeableness, conscientiousness, and openness are in low positive correlations with interpersonal and informational justice. Job satisfaction is in low positive correlation with interpersonal and informational justice

Finally, the obtained correlations between criterion variables are expected. Correlations between personal burnout, work-related burnout, student-related burnout are positive and of large intensity.

In order to determine the particular contribution of the personality traits of the Big Five model, job satisfaction and organizational justice to explanation of personal burnout, work-related burnout, and student-related burnout, three hierarchical regression analyses were conducted, and the results are shown in Tables 3-5. In each hierarchical regression analysis, the sequence of introducing the predictor variables into the regression equation was the same. Based on the results of previous research on the role of personal and situational factors in the occurrence of burnout of employees (Dedić, 2005), in the first step we introduced personality traits. Although the results of the correlation analysis did not indicate significant correlations between openness and burnout on our sample, the results of previous research show that openness is a significant determinant of employee burnout, and therefore openness was included in the regression model nevertheless. In the second step, job satisfaction was introduced. Organizational justice was introduced in the last step.

Table 3 Hierarchical regression analysis of personality traits, job satisfaction and organizational justice for personal burnout

Predictors	Step 1	Step 2	Step 3
	β	β	β
Extraversion	-.042	.011	.007
Agreeableness	-.033	.081*	.089*
Conscientiousness	-.103*	.016	.011
Neuroticism	.356**	.318**	.314**
Openness	.093*	.107**	.094*
Job satisfaction		-.525**	-.520**
Distributive justice			-.141**
Procedural justice			.020
Interpersonal justice			-.041
Informational justice			.055
<i>Corrected R²</i>	.162**	.376**	.387**
ΔR^2		.214**	.110*

* $p < .05$, ** $p < .01$

As shown in Table 3, the personality traits of the Big Five model, included in the first step explained 16.2% of the variance of personal burnout, which indicates moderate predictive power (.14 < R^2 < .26; Cohen, 1988). The job satisfaction, included in the second step, explained an additional 21.4% of the variance of personal burnout, which indicates moderate predictive power of job satisfaction for personal burnout.

The organizational justice, included in the third step, explained an additional 11% of the variance of personal burnout, which indicates weak predictive power ($.02 < R^2 < .13$; Cohen, 1988) of the organizational justice for the personal burnout. The model as a whole explained 38.7% of the variance of personal burnout, and significant partial predictors are the agreeableness, neuroticism, openness, job satisfaction, and distributive justice. Job satisfaction is the strongest partial predictor, whereby higher job dissatisfaction correlated with higher personal burnout. It was followed by neuroticism, whereby higher neuroticism correlated with higher personal burnout. Distributive justice was also an important partial predictor, whereby lower distributive justice correlated with higher personal burnout. The openness and agreeableness were the weakest partial predictors, whereby higher openness and higher agreeableness correlates with higher personal burnout.

Table 4 Hierarchical regression analysis of personality traits, job satisfaction and organizational justice for work-related burnout

Predictors	Step 1	Step 2	Step 3
	β	β	β
Extraversion	-.054	.008	.005
Agreeableness	-.089	.045	.048
Conscientiousness	-.113*	.026	.025
Neuroticism	.250**	.206**	.206**
Openness	.119*	.135**	.124**
Job satisfaction		-.612**	-.607**
Distributive justice			-.145**
Procedural justice			.053
Interpersonal justice			.011
Informational justice			.009
<i>Corrected R²</i>	.112**	.403**	.412**
ΔR^2		.291**	.090*

* $p < .05$, ** $p < .01$

When it comes to work-related burnout (Table 4), the personality traits of the Big Five model, included in the first step, explained 11.2% of the variance of work-related burnout, which indicates weak predictive power. The job satisfaction, included in the second step, explained an additional 29.1% of the variance of work-related burnout, which indicates substantial predictive power ($R^2 > .27$; Cohen, 1988) of job satisfaction for work-related burnout. The organizational justice, included in the third step, explained an additional .09% of the variance of work-related burnout, which indicates weak predictive power of organizational justice for the work-related burnout. The model as a whole explained 41.2% of the variance of work-related burnout, and significant partial predictors are the neuroticism, openness, job satisfaction, and distributive justice. Job satisfaction is the strongest partial predictor, whereby higher job dissatisfaction correlated with higher work-related burnout. It was followed by neuroticism; whereby higher neuroticism correlates with higher work-related burnout. Distributive justice was also an important partial predictor, whereby lower distributive justice correlated with higher work-related burnout. The openness was the weakest partial predictor, whereby higher openness correlated with higher work-related burnout.

Table 5 Hierarchical regression analysis of personality traits, job satisfaction and organizational justice for student-related burnout

	Step 1	Step 2	Step 3
Predictors	β	β	β
Extraversion	-.038	.028	.025
Agreeableness	-.126**	.019	.022
Conscientiousness	-.107*	.042	.042
Neuroticism	.191**	.144**	.143**
Openness	.090	.108**	.094*
Job satisfaction		-.662**	-.649**
Distributive justice			-.148**
Procedural justice			.038
Interpersonal justice			.050
Informational justice			-.037
<i>Corrected R²</i>	.098**	.431**	.444**
ΔR^2		.333**	.013**

* $p < .05$, ** $p < .01$

As for the student-related burnout (Table 5), the personality traits of the Big Five model, included in the first step, explained 9.8% of the variance of student-related burnout, which indicates weak predictive power. The job satisfaction, included in the second step, explained an additional 33.3% of the variance of student-related burnout, which indicates substantial predictive power of job satisfaction for the student-related burnout. The organizational justice, included in the third step, explained an additional 1.3% of the variance of student-related burnout, which indicates weak predictive power of organizational justice for the student-related burnout. The model as a whole explained 44.4% of the variance of student-related burnout, and significant partial predictors are the neuroticism, openness, job satisfaction, and distributive justice. Job satisfaction was the strongest partial predictor, whereby higher job dissatisfaction correlated with higher student-related burnout. Distributive justice and neuroticism followed, whereby lower distributive justice and higher neuroticism correlated with higher student-related burnout. The openness was the weakest partial predictor, whereby higher openness correlated with higher student-related burnout.

Since zero-order correlations between openness and burnout indicators are statistically non-significant (Table 2), and beta ponders of openness are positive and statistically significant (Table 3, 4, 5), there is a high likelihood that the suppression effect occurred. Namely, the suppressor variable has a positive beta when the correlation of the suppressor variable and some predictor is negative. In this case, the openness is in a negative and statistically significant correlation with neuroticism (Table 2).

Discussion

The aim of this study was to examine the contribution of personality traits of the Big Five model, job satisfaction, and organizational justice in explaining teachers' burnout. The results of the conducted research on a relatively large and heterogeneous sample of elementary school teachers in Bosnia and Herzegovina showed that personal burnout, work-related burnout, and student-related burnout in teachers can be explained based on the personality traits of the Big Five model, job satisfaction and organizational justice.

Organizational justice explained the small percentage of the variance of personal burnout, work-related burnout, and student-related burnout and only distributive justice proved to be a significant negative predictor of personal burnout, work-related burnout, and student-related burnout. Such findings were expected. According to Cohen-Charash and Spector (2001), distributive justice is in a strong relationship with cognitive, affective, and behavioural reactions to particular outcomes. When a particular outcome is perceived to be unfair, it affects the person's emotions, cognition, and behaviour. The working conditions in schools in Bosnia and Herzegovina are challenging (e.g. a large number of children in classes, inclusive education, administrative jobs), and require teachers' higher commitment to work and teachers do more jobs than they are paid for. Teachers who devote themselves to the teaching process by attending conferences, investing resources in additional education, engaging in the development of each student, and working with the families and local community, are treated almost the same way as teachers who do not devote themselves to the teaching process (teachers who are just fulfilling the required minimum). The perception of the level of investment and the benefits achieved, do not differ regardless of their level of invested resources. This leads to dissatisfaction and frustration, and in the end, to burnout.

Personality traits of the Big Five model explained the relatively small percentage of the variance of work-related burnout and student-related burnout and a moderate percentage of the variance of personal burnout. Agreeableness, neuroticism, and openness proved to be significant predictors of personal burnout, while neuroticism and openness proved to be significant predictors of work-related burnout and student-related burnout; whereby higher agreeableness correlated with higher personal burnout, and higher neuroticism and higher openness correlated with higher personal burnout, work-related burnout, and student-related burnout. As we noted earlier in the Results, there is a high likelihood that openness is a suppressor variable. On the one hand, zero-order correlations between openness and burnout indicators are statistically non-significant, and beta ponders of openness are positive and statistically significant. On the other hand, openness is in a negative and statistically significant correlation with neuroticism.

Neuroticism proved to be the most powerful positive predictor of personal burnout, work-related burnout, and student-related burnout in teachers. This finding is expected and in accordance with the findings of earlier research (Storm & Rothmann, 2003; Magnano, Paolillo & Barrano, 2015). Individuals with a high score on neuroticism are more prone to define many situations as dangerous and also use a non-adaptive stress coping strategy (McCrae & Costa, 1990). Working with children in their process of growing up is challenging and full of various frustrations and obstacles. Teachers are challenged to monitor the development of each student individually, cooperate with parents, school and the local community. Such challenges for teachers with pronounced neuroticism can be frustrating and stressful, and due to the lack of coping mechanisms, it can lead to burnout.

Openness in a rigid education system can be a problem because teachers are forced to constantly adapt their work to fit rigidity. In addition, teachers constantly accumulate new experiences, and only some of them can be implemented in practice. This is something that can lead to professional burnout (Kokkinos, 2009). On the one hand, openness is associated with curiosity and readiness to leave the comfort zone (McCrae & Costa, 1990) and this brings innovation into the teaching process. On the other hand, this also increases the chances of burnout, because the level of invested resources is far higher than the profit which

teachers can get from their jobs.

Teachers with high scores on the agreeableness scale have a tendency to become compassionate (McCrae & Costa, 1990), which can be stressful in a school environment. Teachers' job includes cooperating with parents, which is very challenging in our educational system. The desire to encourage the change and to help children in different ways, and the inability to achieve change, can be frustrating. Teachers who strive to respond to high standards, by trying to satisfy everyone involved in children's education, are challenged to fulfill many needs and requirements, but also to harmonize their work-life balance. Finally, in previous research (Cano-Garcia, Padilla-Munoz, & Carrasco-Ortiz, 2005; Fontana & Abousaarie, 1993), agreeableness also proved to be a significant positive predictor of burnout in teachers.

Job satisfaction explained a relatively large percentage of the variance of personal burnout, work-related burnout, and student-related burnout, and proved to be the most powerful predictor of personal burnout, work-related burnout, and student-related burnout in teachers. The obtained results indicate that teachers who are more satisfied with their work are less inclined to burnout. This finding is expected and in accordance with research findings made in this field (Brackett, Palmer, Moses-Kaja, Reyes, Salovey, 2010; Skaalvik & Skaalvik, 2009). Teachers who are satisfied with their job are considered efficient in performing work responsibilities and are less inclined to burnout. They feel efficient and eager to respond to job requirements, which is very important in the prevention of burnout.

Finally, the present study has several limitations. Firstly, the study used a convenience sampling method. Although the sample is heterogeneous in terms of the basic characteristics of teachers employed in a relatively large number of elementary schools from different urban and rural parts of Bosnia and Herzegovina - it is not representative and it's possible that the differences in terms of socio-demographic characteristics in relation to the population of teachers in Bosnia and Herzegovina were not completely verified. Moreover, the effect of a "healthy employee" (Karasek & Theorell, 1990) should be put into consideration. The study included teachers who performed their work responsibilities at the time the study was being conducted (meaning, relatively healthy teachers), and excluded those who were absent due to illness or work burnout. Secondly, all data were collected from the same sources during the same time period - through the self-assessment of participants, therefore there is the possibility of the effect of "common method bias" (Podsakoff et al., 2003). The respondents might have distorted results by not answering quite honestly, either due to distrusting their own anonymity or giving socially desirable responses as they were aware of the importance of the teaching profession. In order to prevent this problem in future research, data on predictor and criterion variables should be collected from different sources, in this case, from supervisors and students. In addition, it is necessary to introduce a time difference between the measurement of predictor and criterion variables. In the third place, the transversal research design does not allow the conclusion of causal relationships between the examined constructs, nor the determination of the process of their development and change over time. Therefore, this research does not try to draw conclusions about causal relations, but it remains at the level of correlation and prediction and retains the possibility of obtaining alternative explanations of the relations between the variables in the tested model. Finally, other personal factors of burnout also include self-efficacy and work motivation, while situational factors of burnout also include support from colleagues and leaders and work engagement, which was not included in this study. Therefore, future research should include and examine the contribution of these personal and situational factors to the teacher's burnout.

However, indicated limitations do not diminish the significance of the obtained results, and it's practical implications, which refer to the importance of the role of personality traits, job satisfaction, and organizational justice in the occurrence of the teacher's burnout phenomenon. Although the teacher's burnout partly arises from personality traits, it is also strongly conditioned by work-related attitudes, so job satisfaction and experience of distributive justice can be used to prevent professional burnout. Accordingly, in preventing teacher's burnout it is important to focus on a better selection of candidates for the position

of a teacher. In addition, school's management should work on increasing teachers' job satisfaction and the experience of fairness in the distribution of organizational resources in order to prevent burnout. This is important not only in the context of the teacher's mental and physical health but also in the implementation of the educational goals.

Conclusion

The obtained results show that personal burnout, work-related burnout, and student-related burnout in teachers can be explained based on the job satisfaction, personality traits of the Big Five model – agreeableness, neuroticism and openness, and distributive justice. The results are important for researchers, as they help them understand the mechanism of teacher burnout, but also for the school management so they can work on more efficient prevention programs.

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Stress among Humanitarian Deminers: the Role of Family Support, Work-to-Family Conflict and Factors Related to Mental Help-Seeking

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**What is Humility and Do We Need It?
Validating a Humility Questionnaire**

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Emotional Problems and Specific Irrational Beliefs of Children and Adolescents Suffering from Headaches

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Personality and Dressing Style: Cues and Stereotypes

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Who's That girl? Facial Appearance Based Inferences

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Predicting Work and Family Conflict Using Personal Values, Work Characteristics and Family Functioning Perceptions from Both Spouses

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Premature Birth: Social Support as a Predictor of Positive and Negative Aspects of Maternal Well-Being

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**Personality Traits, Job Satisfaction and Organizational
Justice as Determinants of Burnout in Teachers**

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