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Relationship Between Passion for Playing Video Games and Behavioral School Engagement: Mediation Through Time Spent Playing

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Abstract

The aim of this study was to examine the relationship of harmonious and obsessive passion for playing video games with behavioral school engagement, and to determine whether these two types of passion are indirectly related to behavioral school engagement through time spent playing video games. Data for this correlational, on-line study were collected from a convenience quota sample of 568 high-school students (55.5% boys) between 14 and 19 years old ($M = 15.89$; $SD = 1.16$). Participants self-reported their passion for playing video games, the amount of time they spent playing video games, and their behavioral school engagement. Path analysis showed that both harmonious and obsessive passion exerted direct effects on behavioral school engagement, as well as indirect effects through time spent playing video games. Higher harmonious passion was directly related to higher school engagement, but it was also indirectly related to lower school engagement because of its association with more time spent playing video games. In contrast, higher obsessive passion was related to lower school engagement both directly as well as indirectly through its association with more time spent playing. The results are discussed in the context of the dualistic model of passion.

Keywords: gaming; harmonious passion; obsessive passion; time spent playing; behavioral school engagement

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Introduction

In this modern age, children and adolescents spend much of their free time in digital gaming activities (Hygen et al., 2019). One analysis of a representative sample of Croatian students 9–17 years old showed that 70% of students play online video games at least once a week, while 40.3% of students played online video games almost every day (Ciboci et al., 2020). These data are comparable to those found in other countries, such as the Spain (e.g., Gómez-Gonzalvo, Devís-Devís, et al., 2020), Norway (e.g., Leonhardt & Overå, 2021) and Italy (e.g., Donati et al., 2021).

Video game playing may begin as entertainment, but it can become a problem for persons involved in the activity. Although some studies show that playing video games can be beneficial for children (e.g., Kovess-Masfety et al., 2016), the research literature attests to growing concern that video game playing exerts negative effects on different aspects of children's psychological states and on their behavior. For example, excessive video game

playing has been associated with social anxiety (Wang et al., 2019), loneliness (Wang et al., 2019), depression (e.g., Mikuska & Vazsonyi, 2017; Wang et al., 2019), and aggressive behavior (e.g., Shao & Wang, 2019).

Therefore, it seems important to understand the motivation of people who engage in video gaming, and the concept of passion may be useful for such understanding. Passion is a construct involved in our daily lives, yet only recently have researchers begun to consider its role in daily activities and areas of life (Vallerand, 2010). According to the dualistic model of passion (Vallerand, 2010; Vallerand et al., 2003, 2007), passion for an activity encompasses an investment of substantial time and energy in that activity, a liking of that activity, and the opinion that it is important.

In considering passion, the dualistic model adopts a motivational perspective, and it distinguishes harmonious and obsessive passion. Harmonious passion for an activity means that the individual exerts control over that activity and puts it aside if something else needs to be done. Obsessive passion, in contrast, refers to an internal pressure that forces the individual to engage in the activity, rendering it beyond the individual's control. Each type of passion is associated with different qualities of activity engagement (Vallerand et al., 2003). Harmonious passion is associated with greater flexibility around engagement in that activity and with broader consideration of the circumstances that may prevent engagement, such as school, work, and family obligations (Mageau & Vallerand, 2007).

The dualistic model of passion predicts that harmonious passion facilitates adaptive outcomes such as life satisfaction, meaning in life, and vitality, whereas obsessive passion does not facilitate such outcomes, or it does so to a smaller extent (Vallerand, 2010). Harmonious passion seems to trigger positive affective experiences, which tend to generalize to other domains of the individual's life (Mageau & Vallerand, 2007). Obsessive passion, in turn, is predicted to facilitate maladaptive outcomes such as depression, anxiety, guilt and shame (Vallerand, 2010). An obsessive individual who cannot engage in the activity experiences emotional suffering (Vallerand et al., 2003).

This model has been tested in a range of life domains, including sports (e.g., Loftesnes et al., 2021), education (e.g., Yeh & Chu, 2018), relationships (e.g., Guilbault et al., 2020), work (e.g., Anagnostopoulos et al., 2016), shopping activities (e.g., Okazaki et al., 2021), leisure (Verner-Filion et al., 2018), Internet use (e.g., Naydanova & Beal, 2016), and gambling (e.g., Holding et al., 2021). Passion has also been studied in video gaming (e.g., Holding et al., 2021; Kneer & Rieger, 2015).

Harmonious passion for video games has been associated with such positive outcomes as skill development, motivation to relax and enjoy free time, post-play energy, and life satisfaction (Przybylski et al., 2009; Tóth-Király et al., 2019). Obsessive passion for video games, in contrast, has been associated with loneliness, post-play tension, motivation to procrastinate, as well as lower mental and physical health (Mandryk et al., 2020; Przybylski et al., 2009; Tóth-Király et al., 2019). It has also been associated with Internet Gaming Disorder (e.g., Allen, 2020), which is sometimes referred to in the literature as problematic video game playing, gaming addiction, gaming disorder, and so on. According to some authors (e.g., Allen, 2020), all these terms refer to Internet Gaming Disorder, which is included in the fifth revision of the Diagnostic and Statistical Manual (DSM-5). However, Allen (2020) also suggests the term Gaming Disorder as more appropriate as there are also offline games. Furthermore, there is debate in the literature as to whether Gaming Disorder can truly be distinguished from obsessive passion for video games, as both concepts are defined with the characteristic of control by the activity. Based on a calculation of discriminant validity in relation to these two concepts, Kneer and Rieger (2015) concluded that they can be distinguished. That is, if a person has an obsessive passion for video games, this does not automatically mean that they also have real-life problems, as would be the case with a Gaming Disorder.

So, playing video games can lead to both positive and negative outcomes. When it comes to the playing video games by adolescents, there is a growing concern in the literature about the negative effects of this pastime on different areas of their lives. A major concern is the negative impact of video game playing on the academic performance of adolescent gamers. One study (Griffiths et al., 2004) showed that about a quarter of adolescent video game players sacrifice their education and/or time for schoolwork in favor of playing video games.

Thus, there is a significant relationship between time spent playing video games and students' academic performance and schoolwork. However, some data suggest that this relationship is more complex than it seems. Gómez-Gonzalvo, Molina, et al. (2020) reported that frequent and moderate video game players have good academic performance, while intensive players have poor academic performance. These findings suggest that the different nature of engagement in playing video games is an important factor in whether this activity positively or negatively affects adolescents' academic performance and schoolwork. Sibilla et al. (2021) found that increased time spent playing video games was a characteristic of obsessive involvement, but not of harmonious involvement

in playing video games. Thus, time spent playing video games may be related to motivation for playing video games, but this depends on whether there is an obsessive or harmonious passion for playing video games.

Individuals with a harmonious passion for video games have control over their beloved activity and can choose not to play video games when they have school commitments. Harmonious passion for video games is associated with positive affect, and positive affect facilitates adaptive responses to different environmental conditions (Aydinli-Karakulak et al., 2017). In this sense, positive affect has been shown to promote academic engagement in adolescents (Aydinli-Karakulak et al., 2017).

On the other hand, people with an obsessive passion for video games have no control over their beloved activity. Unlike harmonious passionate individuals, when compulsive passionate individuals play games, they are prone to negative affect (Lafrenière et al., 2009). Nevertheless, they are compelled to play video games and spend a lot of time on this activity (Lafrenière et al., 2009), leaving them less time for schoolwork.

Current Study

This study contributes to the literature by examining what kind of effect playing video games has on adolescents depending on their passion for the activity and the amount of time they spend playing. It focuses on the effects of playing video games on adolescents' behavioral school engagement, which is considered crucial for students' academic performance (Fredricks et al., 2005; Lei et al., 2018).

According to Fredricks et al. (2005), behavioral school engagement refers to the completion of schoolwork and adherence to school rules. On a typical school day, students have a lot of schoolwork to do. If they spend a lot of time playing video games, it can distract them from reading, homework, and other school activities (Cummings & Vandewater, 2007; Hellström et al., 2012). Therefore, it is of great importance to analyze the impact of time spent playing video games on a typical school day on adolescent's behavioral school engagement. Given the findings (e.g., Gómez-Gonzalvo, Molina, et al., 2020) showing that intensive video game play is related to poorer academic performance and moderate video game play is related to good academic performance, it seems likely that the effects of time spent playing video games on a typical school day on behavioral school engagement reflect the effects of the type of passion associated with video game play. Thus, in this study, we suggest that playing video games on a typical school day may have both positive and negative effects on adolescents' behavioral school engagement, depending on the type of passion associated with the video game playing.

Based on the dualistic model of passion (Vallerand et al., 2003, 2007) and previous research, this article proposes several hypotheses.

The dualistic model of passion (Vallerand et al., 2003, 2007) and previous research indicate that greater harmonious passion is associated with stronger positive and weaker negative outcomes, whereas obsessive passion is associated with weaker positive and stronger negative outcomes.

H1: Therefore, we hypothesized that harmonious passion would be directly related to higher behavioral school engagement, while obsessive passion would be directly related to lower behavioral school engagement.

The dualistic model of passion also stipulates that harmonious passion is associated with taking into account situational factors such as constraints and obligations when deciding whether to engage in the activity, while obsessive passion is associated with activity engagement regardless of external demands (Mageau & Vallerand, 2007).

H2: Therefore, we hypothesized that harmonious passion would not be associated with time spent playing video games on a typical school day.

Individuals with harmonious passion are able to control their video game behavior and engage in long gaming sessions on weekends when they have more time for their school obligations and playing video games. This does not necessarily mean that they do not play video games at all during the school day, but rather that they engage in short gaming sessions during the school day just like those who do not have a passion for playing video games.

H3: On the other hand, obsessive passion would be associated with more time spent gaming on a typical school day.

Individuals with obsessive passion invest a large amount of their time in this activity, no matter how much schoolwork they have because they are not able to control their video game playing.

The two types of passion for gaming have been linked to different patterns of time spent playing (e.g., Lafrenière et al., 2009; Sibilla et al., 2021), so time spent playing on a typical school day may mediate the relationship between obsessive passion for gaming and behavioral school engagement. After all, spending time in one activity, regardless of other obligations, means less time for other activities. Therefore, we hypothesized that obsessive passion for gaming, but not harmonious, would be positively associated with time spent playing video games, which in turn would be negatively related to behavioral school engagement.

H4: We proposed that the time spent playing video games on a typical school day would mediate the relationship between obsessive passion for playing video games and behavioral school engagement, while harmonious passion would exert only a direct effect on behavioral school engagement.

Method

Participants

Students attending high schools or vocational schools in the four largest cities in different regions of Croatia (Zagreb, Split, Rijeka, Osijek) were invited to participate in the study. Students who reported that they had played video games at least once in the last month were eligible for enrollment. A total of 690 eligible participants agreed to participate in the study, but 22 (3.19%) failed to complete the questionnaires and were therefore excluded from analysis. The final sample consisted of 568 participants (55.46% boys, 44.54% girls). The age of the participants ranged from 14 to 19 years ($M = 15.89$; $SD = 1.16$). The students were attending high schools (59.33%) and vocational schools (40.67%) in the four cities as follows: Zagreb, 47.89% of participants; Split, 28.87%; Rijeka, 19.54%; and Osijek, 2.99% (0.70% of participants did not answer this question).

Instruments

Passion for Playing Video Games

To measure passion for playing video games, the Passion Scale was applied (Vallerand, 2010). The passion scale comprises two subscales, each with six items, to measure harmonious and obsessive passion. Participants had to indicate their level of agreement with each of the 12 statements, using a 7-point scale (1 = *not agree at all*; 7 = *very strongly agree*). A higher total score on the scales indicates a higher passion for playing video games. Participants were told to consider video gaming as the activity in question.

Harmonious passion arises from the autonomous internalization of a particular activity into one's identity, and it encourages one to engage in that activity. An example of the six items is: *This activity is in harmony with other activities in my life*. Obsessive passion arises from controlled internalization and is an uncontrolled desire to engage in an activity that a person loves. An example of the six items is: *I have almost an obsessive feeling for this activity*.

Previous work with the Passion Scale has confirmed its two-factor scale structure (Vallerand et al., 2003), its convergent and divergent validity (Marsh et al., 2013), and the applicability of the same set of items for measuring passion for diverse activities (Marsh et al., 2013). The Croatian version of the Passion Scale was translated for the purposes of this study. Exploratory factor analysis revealed two significant factors. The saturation of all items was above .60 and the two factors explained 61.84% of the variance. The first factor included items measuring obsessive passion and was labelled the Obsessive Passion subscale. The second factor included items measuring harmonious passion and was labelled the Harmonious Passion subscale. In the present study, the two subscales showed good internal consistency: Cronbach's alpha was .88 for harmonious passion and .85 for obsessive passion.

Behavioral School Engagement

Behavioral school engagement refers to doing schoolwork and following school rules. It was measured in the present study using the Behavioral School Engagement subscale of the School Engagement Scale (Fredricks et al., 2005). In the five items of this subscale, participants indicate how frequently they engage in each behavior, using a 5-point scale (1 = *never*; 5 = *always*). An example of the five items is: *I follow the rules in school*. The total score is calculated as the average score across all items, and a higher total score indicates greater behavioral school

engagement. The scale was previously validated on a Croatian sample (Pandžić et al., 2017). In this research, exploratory factor analysis revealed one significant factor explaining 47.70% of the variance. The saturation of all items was above .50. Previous work has shown a Cronbach's α of .72 for internal consistency (Fredricks et al., 2005), and the same value was obtained in the present study.

Time Spent Playing Video Games

To measure time spent playing video games, participants were asked to answer the following question: *How much time do you spend playing video games during a typical school day?* The instructions indicated that if they played for less than an hour, they should report 0 under the hour column and the exact minutes under the minute column. For further analyses, time spent playing was converted to minutes.

Procedure

The Ethics Committee of the University of Zagreb, Faculty of Education and Rehabilitation Sciences approved the study before it began. Researchers contacted two high schools and two vocational schools in each of the four cities and invited them to participate. The schools' professional staff sent parents a notice that the study was being conducted before we approached potential participants. An invitation to participate in the online survey was then sent to students. This invitation described the purpose of the research, instructions for participation, and a link to access the questionnaire. The link was made available online from November 2020 until January 2021. Completion of the online questionnaire was voluntary and anonymous, and participants could withdraw from participation at any time. Participants were informed that the collected data would be analyzed at the group level, without highlighting any data that might allow identification of the participants. The likelihood and degree of discomfort that participants might experience was expected to be no greater than what they normally experience in their daily lives.

Data Analyses

Data were analyzed using SPSS 23 software and MPlus 7.0 software. Descriptive indicators were analyzed using non-parametric statistical tests, and correlations between variables were assessed using Pearson's correlations with bootstrapping. In the absence of data for cut-off points of the scales used, the mean values obtained in the study were commented in relation to the theoretical minimum and maximum. Research hypotheses were tested by applying path analysis to the observed variables. To address the non-normality of the data, parameter estimates were calculated using the MLM method, in which standard errors are robust to non-normality. Mediation effects were calculated using the delta method (MacKinnon, 2008), which is a modification of the Sobel test for non-normally distributed data.

Results

Only high school students who played video games in the last month participated in this study. Descriptive statistics and correlations among variables are presented in Table 1. Participants had, on average, a low level of obsessive passion and moderate level of harmonious passion. However, the sample showed substantial variation in the two variables, based on dispersion indicators. The median values showed that participants typically spent one hour per school day playing video games.

Table 1. *Descriptive Statistics and Pearson's Correlations Among Variables in the Path Analysis (N = 551).*

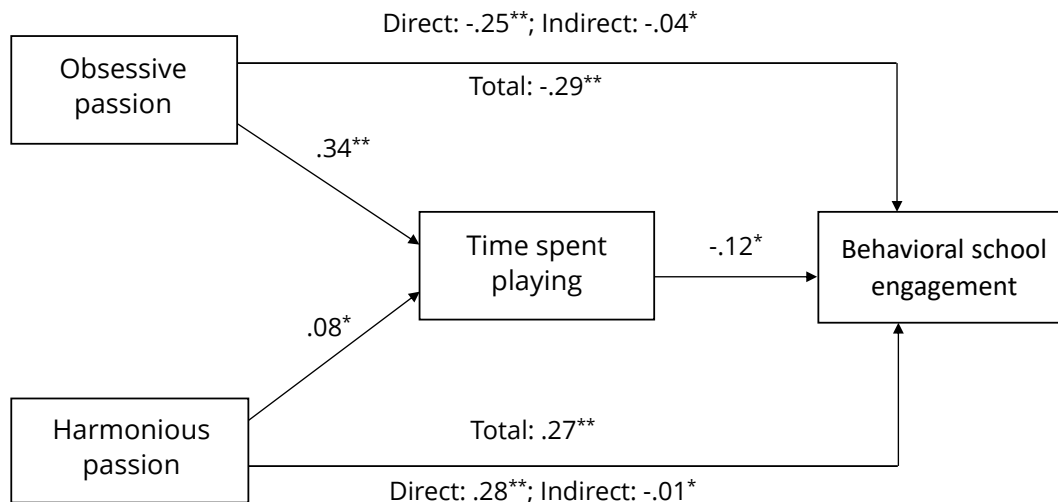
| Variable | C(Q) | min | max | 1 | 2 | 3 | 4 |
|---------------------------------|--------------|------|---------|---|-------|-------|--------|
| 1. Obsessive passion | 1.67(0.84) | 1.00 | 7.00 | — | .45** | .38** | -.21** |
| 2. Harmonious passion | 4.00(1.17) | 1.00 | 7.00 | | — | .23** | .16** |
| 3. Time spent playing | 60.00(50.00) | 0.00 | 1499.00 | | | — | -.16** |
| 4. Behavioral school engagement | 4.20(0.50) | 1.00 | 5.00 | | | | — |

Note. Abbreviations: C = median; Q = interquartile range; min = lowest observed value; max = highest observed value. ** $p < .01$.

Descriptive statistics showed a high level of behavioral school engagement, although again with substantial variation.

Pearson's correlations showed that higher level of obsessive passion was associated with lower behavioral school engagement, while higher level of harmonious passion was associated with higher behavioral school engagement. Both obsessive and harmonious passion were positively associated with time spent playing video games, which itself was negatively associated with behavioral school engagement. The two types of passion were moderately positively associated with each other.

Figure 1. Path Analysis of the Mediating Effect of Time Spent Playing Video Games on the Associations of Each Type of Passion With Behavioral School Engagement (N = 551).



Note. Standardized parameter estimates are shown. Total = total effect; Direct = direct effect; Indirect = indirect effect.
* $p < .05$, ** $p < .01$.

Path analysis indicated a partial mediating effect of time spent playing video games on the associations between each type of passion and behavioral school engagement (Figure 1). Both obsessive passion and harmonious passion had a significant direct effect on behavioral school engagement, 95% CI [-0.431, -0.195] and 95% CI [0.236, 0.414], respectively (for the total effect 95% CI [-0.455, -0.249] and 95% CI [0.228, 0.405], respectively). There was also a significant indirect effect of both types of passion on school engagement *via* time spent playing video games. Higher obsessive passion was related to more time spent playing video games, which in turn was associated with lower behavioral school engagement. The effect of harmonious passion was, however, more complex: it exerted a positive direct effect on behavioral school engagement (i.e., higher harmonious passion was related to higher school engagement), but a negative indirect effect on engagement *via* time spent playing (i.e., higher harmonious passion was related to more time spent playing, which in turn was related to lower school engagement).

The model explained 10.00 percent of the observed variance in behavioral school engagement and 14.70 percent of the observed variance in time spent playing video games. According to Preacher and Kelley's (2011) cut-off guidelines, both indirect effects were small (obsessive passion 95% CI [-0.077, -0.002]; harmonious passion 95% CI [-0.017, -0.001]).

Discussion

The present study examined the mediating role of time spent playing video games in the association between passion for playing video games and behavioral school engagement. This line of research is important because it has been shown that the time adolescents spend playing video games can have both positive and negative effects. Discovering the factors that underlie these different effects of video gaming is important, especially with regard to adolescents' behavioral school engagement, which is one of the most important factors in academic performance.

Based on the dualistic model of passion (Vallerand, 2010; Vallerand et al., 2003, 2007), we hypothesized that higher levels of harmonious passion would be associated with higher levels of behavioral school engagement, whereas higher levels of obsessive passion would be associated with lower levels of behavioral school engagement (H1). Our data confirmed this first hypothesis of the paper. It has been shown that harmonious passion is positively associated and obsessive passion is negatively associated with behavioral school engagement, although the size

of this association is small. These findings are consistent with research showing that harmonious passion is positively associated with adaptive outcomes such as post-play energy and life satisfaction (Przybylski et al., 2009), which are important preconditions for engagement in school activities. Obsessive passion, in contrast, is associated with maladaptive outcomes such as post-play tension (Przybylski et al., 2009) as well as procrastination (Tóth-Király et al., 2019), which are likely to negatively affect behavioral school engagement.

According to the dualistic model of passion (Mageau & Vallerand, 2007; Vallerand, 2010; Vallerand et al., 2003, 2007), a person with a harmonious passion for gaming feels enjoyment during gaming yet is not controlled by the activity. Rather, the person *chooses* when to play, depending on his or her other obligations. For example, a student with a higher level of harmonious passion will play video games in his spare time after he has fulfilled his school and family obligations. In other words, how much time he spends playing video games is determined more by situational factors. Considering that those with more harmonious passion for playing video games should be more flexible about when they play (Mageau & Vallerand, 2007), we did not expect a significant relationship between harmonious passion and time spent playing during a typical school day, as students have more school and extracurricular activities during school days (H2). In contrast, we expected that those with a higher level of obsessive passion for gaming would be more rigid about participating in that activity and therefore less willing to make it contingent on commitments; therefore, we expected that such individuals would spend more time playing video games (H3).

Our results showed that, as expected, obsessive passion was positively associated with time spent playing during the school day. We were surprised to see the same positive association, albeit weaker, between harmonious passion and time spent gaming. We find that the possible explanation for the association between harmonious passion and time spent playing video games lies in the recall bias. Namely, we asked participants to estimate how much time they spent playing video games during a typical school day. Our method is open to recall bias, in contrast to the diary method of collecting data, in which each participant wrote down the actual time spent immediately afterwards. Thus, our participants may have reported time spent playing video games based on days when they played more (i.e., had more time to play), even if this was not a typical school day, since it may have been easier for them to remember longer gaming sessions. Such bias may help explain the weak positive correlation between harmonious passion and time spent playing games in our study. It may also confound the observed association between obsessive passion and time spent playing. Therefore, future research should make more use of the diary method of data collection to reduce recall bias.

We had hypothesized that time spent playing video games on a typical school day would mediate the relationship of behavioral school engagement with obsessive passion, but not its relationship with harmonious passion (H4). However, we found a significant indirect effect of both types of passion on behavioral school engagement *via* time spent playing video games. This could be due to the fact that higher levels of both types of passion are associated with more time spent playing video games on a typical school day. It may also reflect the way we measured time spent playing video games in this study and the effect of recall bias that might be associated with such measurement. Even though our finding means that, in principle, higher harmonious passion could be associated with greater or lower behavioral school engagement under different circumstances, we suspect that the net effect of harmonious passion is to increase such engagement. We emphasize that the indirect effect of harmonious passion on behavioral school engagement *via* time spent playing video games is quite small, and any conclusions based on it should be treated with caution. Future work should verify and extend our findings.

The present study has several limitations. The first and most important limitation of the study relates to its cross-sectional design, which prevents conclusions about causal relationships among passion, time spent playing, and behavioral school engagement. Longitudinal studies are needed to fully clarify the relationships among these constructs. The second major limitation is recall bias: students had to recall when and how much they played video games in recent weeks or months in order to report the amount of time they spent playing video games on a typical school day. Future research should extend our results by measuring gaming time in different ways, such as by asking participants to keep a gaming diary during one week or by asking them to report the cumulative amount of time spent gaming during the previous week.

Despite these limitations, the present study appears to be the first to examine the relationship between passion for gaming and behavioral school engagement. Our sample was high school students who had played video games in the past month, regardless of how often or how intensely. Thus, the results of our study may be generalizable across this age group, regardless of their level of gaming. Our data suggest that playing video games is not necessarily associated with negative consequences and that, in some cases, it can be considered a valuable leisure

activity that is associated with outcomes such as higher behavioral school engagement. Whether gaming is associated with negative consequences because the student does not have enough time for school commitments seems to depend on whether the student controls gaming or *vice versa*.

Conflict of Interest

The authors have no conflicts of interest to declare.

Authors' Contribution

Martina Lotar Rihtarić: project administration, funding acquisition, conceptualization, methodology, investigation, writing – review & editing. **Ivana Vrselja:** conceptualization, methodology, investigation, writing – original draft. **Ajana Löw:** formal analysis, visualization, writing – review & editing.

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