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I enjoy hurting my classmates: On the relation of boredom and sadism in schools

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ABSTRACT

Schools can be a place of both love and of cruelty. We examined one type of cruelty that occurs in the school context: sadism, that is, harming others for pleasure. Primarily, we proposed and tested whether *boredom* plays a crucial role in the emergence of sadistic actions at school. In two well-powered studies ($N = 1038$; student age range = 10–18 years) using both self- and peer-reports of students' boredom levels and their sadistic tendencies, we first document that sadistic behavior occurs at school, although at a low level. We further show that those students who are more often bored at school are more likely to engage in sadistic actions (overall $r = .36$, 95% CI [0.24, 0.49]). In sum, the present work contributes to a better understanding of sadism in schools and points to boredom as one potential motivator. We discuss how reducing boredom might help to prevent sadistic tendencies at schools.

1. Introduction

School is an ambivalent place for many students. For example, school can be an inspiring environment where basic knowledge about culture, humankind, and science is learned; where close friendships develop; and where help is received when going through difficult times. Conversely, school can be a place where aggression and cruelty occur, leading to adverse consequences for student victims, including lower academic attainment, anxiety, depression, and suicidal attempts (Arseneault et al., 2010; Hinduja & Patchin, 2010; Moore et al., 2017; Polanin et al., 2021; Schoeler et al., 2018; Siller et al., 2021). The present research focused on a particular type of cruelty in the school context, which is when students harm others for pleasure by engaging in sadistic behavior (Dietz et al., 1990; Međedović, 2017). We proposed and tested whether boredom at school plays a crucial role in the emergence of sadistic tendencies in the school context.

The present work thus had two central aims. The first aim was to document and explain cruel behavior at schools, with a focus on sadistic actions. There exists some (albeit sparse) evidence that cruel behavior in schools can be driven by sadistic motives (e.g., van Geel et al., 2017); however, the analysis of sadism in the school context is still in its infancy. In the present work, we first documented that sadistic tendencies do indeed occur in the school context in students ages 10–18 years (i.e., from fifth grade of primary school to

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year four of secondary school).[1] In addition, we go one step further and offer an explanation for *why* sadism at schools occurs as we argue and show that those students who are often bored at school are more likely to engage in sadistic actions—pointing to boredom as a potential motivator of sadism in the school context.

The second aim was to complement the literature on boredom. Scholars have debated whether boredom is beneficial or harmful, especially in interpersonal situations. To date, boredom has been related to a broad array of intra-personal tendencies, many maladaptive, like anxiety, depression (e.g., LePera, 2011), self-harm (Chapman & Dixon-Gordon, 2007), compulsive gambling (Mercer & Eastwood, 2010), and substance use (Lee et al., 2007), but boredom is also associated with a few positive tendencies (e.g., doodling, mind wandering) that facilitate creative problem solving (Andrade, 2010; Baird et al., 2012; Harris, 2000). However, little is known about the interpersonal effects of boredom (van Tilburg & Igou, 2016); in particular, the *negative* interpersonal consequences and correlates of boredom remain under-investigated (for an exception, see Pfattheicher et al., 2021). Furthermore, relatively little empirical work exists on boredom in non-adult populations (e.g., Nook et al., 2017; Plummer, 2019; Westgate & Steidle, 2020; Weybright et al., 2020). Thus, the present research contributes to the literature by showing that boredom relates to sadistic tendencies in the school context and does so even among teenagers and adolescents.

Overall, the present work contributes to research on both boredom and sadism and increases our understanding of cruel behavior in the context of schools. Below, we outline the current state of research on sadism (in schools) and boredom and then we present a framework for why boredom motivates sadism in the school context.

1.1. Sadism in the school context

Sadism is the practice of an individual causing others pain and suffering for the purpose of gaining pleasure for themself (Dietz et al., 1990; Međedović, 2017; O'Meara et al., 2011). Within the context of sadism, pleasure typically refers to general positive affect as well as more specific emotions such as joy and excitement (Buckels, 2018; Chester, 2017). Sadism encompasses harmful acts in which the perpetrator derives pleasure directly from the act, in and of itself, of harming another individual. Given that sadism involves causing harm to another individual (and reaping pleasure from it), it can be considered a form of aggression, defined as "any form of behavior directed toward the goal of harming or injuring another living being who is motivated to avoid such treatment" (Baron & Richardson, 1994, p. 7). Sadism is one manifestation of aggression, placing the present study within a broader context of research on aggression, broadly construed. The unique defining feature that separates sadism from other forms of aggression is the tendency to derive pleasure from other people's suffering—something that is not inherent to other aggressive behavior (Anderson & Marcus, 2019; Chester et al., 2019; Johnson et al., 2019; Paulhus, 2014).

Sadism appears in both clinical and subclinical everyday settings (Chabrol et al., 2009). Several studies have demonstrated that sadism plays a unique motivational role (i.e., beyond other "dark" tendencies) in killing bugs (Buckels et al., 2013), online "trolling" or the practice of behaving destructively towards others on the internet (Buckels et al., 2014, 2019; Sest & March, 2017), harming an unknown person—even at personal cost (Buckels et al., 2013; Pfattheicher et al., 2017), harming prosocial interaction partners (Pfattheicher et al., 2017; Pfattheicher & Schindler, 2015), sexual aggression towards women (Russell & King, 2016), vandalism (Pfattheicher et al., 2019), and playing violent video games (Greitemeyer, 2015; Greitemeyer et al., 2019; Greitemeyer & Sagioglou, 2017).

Sadism in the school context can emerge in different ways, such as when an individual enjoys physically hurting classmates (i.e., physical sadism; Buckels, 2018), when a student enjoys making jokes at the expense of their classmates (i.e., verbal sadism), or when an individual enjoys watching video clips where a schoolmate is made fun of (i.e., vicarious sadism). Conceptually, sadism in the school setting is closely related to bullying. Bullying can be defined as "aggressive behavior or intentional 'harm doing,' which is carried out repeatedly and over time in an interpersonal relationship characterized by an imbalance of power" (Olweus, 1993, pp. 8–9). Intentionally harming others (i.e., aggression) in the context of a power imbalance is an essential element of many definitions of bullying (e.g., Salmivalli, 2010; Volk et al., 2014, 2017). Of note, some researchers also consider these elements to be essential characteristics of sadism; in fact, it has been argued that sadistic aggression often involves a power imbalance between the (dominating) sadistic person and the (dominated) victim (Baumeister & Campbell, 1999; Buckels et al., 2013; Fromm, 1973). In this regard, if sadistic actions are "carried out repeatedly and over time in an interpersonal relationship" (Olweus, 1993, pp. 8–9), they essentially fit the definition of bullying. In fact, sadistic bullying has been observed in the literature, for instance, when bullies laugh in the moments of humiliating their victim (Salmivalli, 2010). Van Geel et al. (2017) documented a correlation of $r = .36$ between self-reported sadism and bullying, further supporting this conceptual overlap.

However, sadistic actions are not necessarily repeated; thus, not all sadistic actions reflect bullying. Likewise, although it has been documented that pleasure is involved in *some* bullying behavior (Salmivalli, 2010; see also Rigby, 2012), not *all* bullying behavior reflects sadism, because the defining element of sadism (i.e., pleasure when harming others) is not always present (Rigby, 2012). Therefore, even though sadism and bullying conceptually overlap, they do not reflect the same construct. As our present contribution focuses specifically on pleasure when harming others, we simply use the term "sadism". However, in the General Discussion we consider the present studies' findings in relation to bullying.

In our present contribution, we argue that boredom is one crucial factor in the emergence of sadistic behavior at schools. Below we

[1] The studies were conducted in Serbia. The Serbian education system consists of 8 years of primary education (Grades 1–8) and 4 years of secondary education (Years 1–4). Children start primary education at around 6 years of age and end secondary education at around 18 years. Thus, the fourth year of secondary education corresponds roughly to Grade 12 in the US education system.

give a brief overview of state-of-the-art research on boredom and then argue that boredom is likely to promote sadistic tendencies.

1.2. Boredom as an aversive motivational state

A state of boredom indicates there is little value in doing one's current task and motivates people to take action to alleviate the boredom. According to Eastwood et al. (2012), boredom can be defined as "the aversive experience of wanting, but being unable, to engage in satisfying activity" (p. 482), which occurs when people are unable to engage their attention or find meaning in what they are doing (Westgate & Wilson, 2018). Boredom takes many forms, but typically involves attentional deficits and meaning deficits represented by difficulty in concentrating, enhanced (or decreased) arousal, and an altered sense of time (Chin et al., 2017; Eastwood et al., 2012; Troutwine & O'neal, 1981; van Tilburg & Igou, 2012, 2017; Westgate & Wilson, 2018).

Attention and meaning are independent causes of boredom and therefore can lead to different kinds of boredom experiences (Elpidorou, 2020; Westgate & Wilson, 2018). Deficits in meaning occur when existing activities do not seem to align with valued and salient goals (Baumeister & Landau, 2018; van Tilburg & Igou, 2012, 2013). In such situations, there is an increase in arousal and dysphoric affect, as well as a desire to disengage from the current task (Westgate & Wilson, 2018).

Deficits in attention result from mismatches between cognitive resources and demands, most commonly due to understimulation (but also in instances following overstimulation; cf. Raffaelli et al., 2018; Westgate & Wilson, 2018). This type of boredom is characterized by difficulty concentrating and difficulty focusing on one's current tasks (Eastwood et al., 2012). Thus, boredom can result from tasks or situations that possess high meaning but fail to elicit attentional engagement, for example, when a schoolteacher introduces a topic too slowly for the most skilled students. Similarly, boredom can result from a task with low meaning but that is also engaging in terms of attention, such as doing drill exercises in math or grammar. However, the most common type of boredom arises simultaneously from both sources, involving both a meaning deficit and an attention deficit. Such mixed states (e.g., when students are neither attentionally engaged nor perceive meaningfulness in an activity) represent what we might term *prototypical* boredom (Barrett, 2006)—the emotion as it is most often experienced in everyday life and at schools, and which lay theories best reflect. In understanding boredom's relation to sadism at schools, we are most interested in understanding these prototypical instances of boredom.

Extensive research has shown that boredom is extremely common in schools (e.g., Daschmann et al., 2011; Furlong et al., 2021; Larson & Richards, 1991; Pekrun et al., 2010). In one cross-sectional experience sampling study, fifth through ninth graders were bored more often at school (32% of the time) than they were at home (23% of the time), with little difference by grade level (Larson & Richards, 1991; see also Goetz et al., 2007). In a large study sampling daily boredom from 3867 Americans over a 10-day period, the number one most boring activity was "studying," and the most boring location was "school or college" (Chin et al., 2017). Combined, people were approximately seven times more likely to be bored while in educational activities and settings.

Drawing on the Meaning and Attentional Components (MAC) model of boredom (Westgate & Wilson, 2018), we predicted that boredom in school results both from lack of sufficient attention in activities and from perceived lack of meaning in lessons and content. Rigby (2007) has likewise argued that inadequate teaching (leading to a lack of attention) and inappropriate subject content (leading to a perceived lack of meaning) contribute to boredom in students (see also Nett et al., 2011). Similarly, Pekrun's (2006) control-value theory of achievement emotions argues that boredom is the joint result of too much (or too little) control over an achievement task (leading to lack of attention) and insufficient perceived task value (leading to a lack of meaning). Empirically, Daschmann et al. (2011) has shown that attention-related factors (including monotony, a lack of involvement, and being under- and over-challenged), as well as lack of meaning, do in fact reflect major components of boredom at schools. These considerations are consistent with an ecological perspective (e.g., Bronfenbrenner & Morris, 2006) on why boredom emerges at schools. Specifically, previous research points to the large impact of the system (or the situation) a person interacts with, rather than to the individuals themselves (Chin et al., 2017; Pekrun et al., 2010). In the school context, this means we must not attribute the boredom students experience at schools to the students themselves. Rather, we must consider that students are an inseparable part of the school system, and that boredom is the result of a mismatch between an individual's skills and knowledge and the environmental demands at school (Burns, 2011).

Past research has shown boredom to be a powerful motivator of behaviors, both "good" and "bad", in that boredom associated with meaning deficits results in increased prosocial intentions, ingroup favoritism and outgroup derogation, and political polarization (van Tilburg & Igou, 2011, 2016, 2017). Similarly, work on attention deficits in boredom has shown that boredom and boredom proneness are related to greater restlessness and underarousal, increased gambling, increased pursuit of novel experiences—even when those experiences are negative—and with inflicting pain on oneself (Bench & Lench, 2019; Danckert & Merrifield, 2018; Havermans et al., 2015; Mercer & Eastwood, 2010; Nederkoorn et al., 2016; Wilson et al., 2014). In the school context, boredom has been associated with dropping out (Bridgeland et al., 2006), truancy (Robinson, 1975; Sommer, 1985), deviant behavior (Wasson, 1981), lower academic motivation and attainment (e.g., Goetz et al., 2014; Pekrun et al., 2010; Tze et al., 2016), and a "general disenchantment with school" (Robinson, 1975).

Overall, boredom motivates individuals to change their current state. In this regard, it is argued that boredom signals a desire for change as means to correct the underlying deficits that precipitated it (Bench & Lench, 2019; van Tilburg & Igou, 2012; Westgate, 2020; Westgate & Wilson, 2018). Accordingly, boredom promotes behaviors that reduce deficits in attention (e.g., gambling, electric shocks), deficits in meaning (e.g., prosocial behavior, ingroup favoritism), or both. If bored people's primary motivation is to stop feeling bored, sadistic actions may offer an avenue that would relieve the boredom. From a basic motivational perspective, boredom is an aversive motivational state that motivates action to alleviate it. In the following sections, we argue that sadistic actions are surprisingly well suited to counter the aversive nature of boredom.

1.3. Relation of boredom and sadism in schools

In their analysis of evil behavior, Baumeister and Campbell (1999) argued that "inflicting harm is likely to be arousing and can perhaps be pleasant, too. As such, it is certainly an antidote to boredom" (p. 216). In this regard, Baumeister and Campbell claimed that boredom is an aversive state that motivates people to engage in different activities that offer "stimulation" or "arousal and pleasure" (see also Barbelet, 1999; Bench & Lench, 2013). Given that causing harm to others can provide stimulation and excitement (Chester, 2017; Chester et al., 2019; Cikara et al., 2014), we argue that sadistic actions might be able to counter boredom—in particular, boredom stemming from attention deficits and understimulation, as in many prototypical instances of boredom. It may even be that sadistic acts become especially alluring when being bored because boredom increases one's overall reward sensitivity (Milyavskaya et al., 2019); this in turn may shift the perceived potential emotional reward of sadistic behavior. Research on bullying has shown that bullies are rewarded through both verbal feedback from peers (e.g., cheering), as well as through nonverbal cues like smiling and laughing (Salmivalli, 2010).

We do not want to imply that sadism does not address meaning deficits as well. In fact, choosing to harm others may serve as an exciting and stimulating distraction from meaninglessness. That said, we are not suggesting that sadism provides meaning per se, in the way that religion or nostalgia do (van Tilburg et al., 2013, 2019); rather, we assert that sadistic aggression can serve as a countermeasure to a lack of meaning. Therefore, both attentional and meaning-based perspectives on boredom yield the same prediction—that boredom motivates sadistic acts.

Consistent with these arguments, recent research has shown that boredom indeed motivates sadistic tendencies (Pfattheicher et al., 2021). In several studies, these authors show that people who reported higher boredom levels in their lives also reported higher sadistic tendencies, such as online trolling and fantasizing about shooting someone for fun. Pfattheicher and colleagues further demonstrated through experimental studies that boredom causes sadistic behavior, including destroying a monetary reward from another person or "shredding" worms in a modified coffee grinder. However, it is unknown whether boredom also motivates sadistic behavior among teenagers and younger adolescents and whether such a relationship might account for sadistic aggression in schools. Given the suspected large prevalence of boredom in schools, understanding the antisocial consequences thereof is especially important. This is precisely the question addressed in our present work, using samples of 10–18-year-old students. Although some researchers have put forward the idea that boredom plays a role in students harassing others in the school context (e.g., Hamarus & Kaikkonen, 2008; Rigby, 2007), and qualitative evidence does support this claim (Owens et al., 2000), no study to our knowledge has quantified the relationship between boredom and sadistic actions in the school context; we address this gap in the two studies reported below.

Finally, we wish to clarify two points. First, we do not postulate that boredom *only* leads to sadism and not to other stimulating and exciting behaviors. Rather, we argue that boredom increases the probability of sadistic behavior because such behavior remedies the deficits that provoked it. Second, we do not argue that boredom makes everyone sadistic. Harming others for pleasure is an extreme, destructive behavior that might not align with private standards (e.g., how students want to be) or with public standards (e.g., social norms). As such, we should expect boredom to correlate only moderately with sadism (as has been shown in previous research in other contexts, see Pfattheicher et al., 2021).

1.4. Overview of studies

We applied a rigorous approach to test the relation between boredom and sadism at schools. We first ran two pilot studies to ensure that even young students understood the items (pilot results are consistent with the main studies—boredom was significantly correlated with sadism; Pilot Study 1, $N = 162$, $r = .52$, $p < .001$; Pilot Study 2, $N = 152$, $r = .36$, $p < .001$—and are reported in detail on the Open Science Framework (OSF; https://osf.io/4qyxs/). In the two following main studies, we obtained large sample sizes ($N = 1038$) to maximize statistical power, sampled an extensive age range of students (10–18 years), and tested the relationship using both self-report and peer-reports (as recommended by Volk et al., 2017). We further embedded sadism in the broader context of bullying by measuring *both* sadism and bullying; additionally, we replicated the findings of the first study in a second study. Finally, we ran an internal meta-analysis including all studies (pilot and main studies) and report the overall effect size.

Moreover, to conservatively test the correlation between boredom and sadism, we examined the robustness of effects controlling for basic personality traits. Because personality traits typically capture a significant portion of the variance in individual differences in motivations and behavior (e.g., Soto, 2019; Thielmann et al., 2020), in both studies we controlled for the HEXACO personality dimensions (Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness; Ashton & Lee, 2007, 2020), as well as Disintegration (i.e., psychosis-proneness; Knezevic et al., 2017, 2022) in Study 2.[2] We also report all relations with and without controlling for age and gender, as previous research has found that men score higher on sadism than women and age to be negatively related to dark traits (e.g., Zettler et al., 2021).[3]

In addition, we exploratively tested whether the relation between boredom and sadism was moderated by the HEXACO personality dimensions and Disintegration. We did not find any significant moderation that replicated across both studies. We report all moderation analyses as supplementary material on the OSF (https://osf.io/4qyxs/).

[2] The Disintegration measure was included because the data collection was part of a larger research program; we included Disintegration in the analyses for exploratory reasons.

[3] We want to acknowledge here that gender is a diverse construct. We admit that in the questionnaire, we measured gender as if it were a binary construct.

1.5. Research ethics statement and data

Studies were approved by the Institutional Review Board of the Department of Psychology, Faculty of Philosophy, University of Belgrade. The study was conducted with the help and under the supervision of the school psychologists, and school directors gave permission for the studies. All participants signed an informed consent prior to completing the questionnaires, and all procedures adhered to the principles of the Declaration of Helsinki. For underage students, consent from a parent or caregiver was obtained prior to data collection. Data, syntax, and study materials are available on the Open Science Framework (OSF; https://osf.io/4qyxs/).

2. Study 1

In Study 1, we examined whether secondary school students prone to experiencing boredom at school were more likely to engage in sadistic behavior and bullying at school. Therefore, we collected peer- and self-reports of boredom, sadism, and bullying behavior from students attending two Serbian secondary schools. In addition, we tested whether such links persisted when controlling for other individual differences (e.g., demographics, HEXACO personality).

2.1. Method

2.1.1. Participants

Participants consisted of 316 students in their final year of high school from two public schools in Belgrade, Serbia. An a priori power analysis using G*Power (Faul et al., 2009) revealed a sample of 160 participants was necessary to detect small-to-medium effects of $r > .25$ (equivalent to $\Delta R^2 > .063$ for a single regression coefficient in multiple regression analyses) with high statistical power of .90 ($\alpha = .05$, two-tailed). We tried to maximize power within given resources (money, time), and thus we oversampled responses. Two participants were excluded either due to responding randomly (in a straight line or a zigzag) or circling multiple answers per item. The final sample thus consisted of 314 students (173 female, 141 male; age: $M_{age} = 18.03$ years, $SD = 0.34$; see Footnote 3). With this sample size, we were able to detect small effects of $r > .18$ (equivalent to $\Delta R^2 > .032$ for a single regression coefficient in multiple regression analyses) with high statistical power of .90 ($\alpha = .05$, two-tailed).

2.1.1.1. Measures. **Sadism**. We adapted the 16-item Comprehensive Assessment of Sadistic Tendencies scale (CAST; Buckels, 2018; Buckels & Paulhus, 2014) to a school context. The CAST contains items encompassing verbal, physical, and vicarious expressions of sadism (Buckels, 2018). Two examples of items include "I enjoy [He/She enjoys] making jokes at the expense of my [his/her] classmates" and "I enjoy [He/She enjoys] physically hurting my [his/her] classmates". The peer-report version was constructed using the substitutions shown in brackets. There is evidence of excellent reliability for multidimensional composite scores obtained via self-report ($\alpha = .89$, $\omega = .89$) and peer-report ($\alpha = .93$, $\omega = .93$). Moreover, coefficient omega hierarchical (ωh; Reise et al., 2010) estimates obtained from exploratory bifactor analysis indicated that substantial percentages of systematic variance in these composite scores were attributable to a common factor ($\omega h = .69$ for self-report, $\omega h = .76$ for peer-report). As such, we did not make use of subscale scores; instead, we focused our analyses on composite scores, as typically done in research on sadism (Thomas & Egan, 2022).

Bullying. We used the 10-item bully scale of the Bully Participant Behaviors Questionnaire (BPBQ; Demaray et al., 2014), adapted to the school context. Two examples of items include "I have [He/she has] pushed, punched, or slapped another classmate" and "I have [He/she has] made fun of another classmate." The scale showed good reliability (self-report: $\alpha = .80$, $\omega = .81$; peer-report: $\alpha = .90$, $\omega = .90$).

Boredom. We adapted the 8-item Short Boredom Proneness Scale (SBPS; Struk et al., 2017) to a school context. Two examples of items are "At school, I find [he/she finds] it hard to entertain myself [him/herself]" and "I am [He/She is] often bored at school." The scale showed good reliability (self-report: $\alpha = .86$, $\omega = .86$; peer-report: $\alpha = .89$, $\omega = .89$).[4]

HEXACO. The HEXACO personality model was assessed using a Serbian translation (Međedović et al., 2019) of the 60-item HEXACO Personality Inventory-Revised (HEXACO-60), containing 10 items for each of the six dimensions. We asked students to complete both self- and peer-report versions (Ashton & Lee, 2009). Except for self-reported Agreeableness ($\alpha = .66$, $\omega = .66$), all subscales had adequate reliability (self-report: $\alpha s > .71$, $\omega s > .70$; peer-report: $\alpha s > .72$, $\omega s > .72$).

2.1.1.2. Procedure. The study was conducted via paper and pencil across nine classrooms. Participants completed self-reports first (in order: boredom, sadism, bullying, and the HEXACO personality inventory) and then provided a peer-report for the student sitting in front of them (students in the first row provided peer-report for students in the last row) on all scales. Thus, all students present in the classroom were rated by a classmate. All measures were in Serbian and all responses (except demographics) were assessed using 5-point Likert scales ranging from 1 (*completely disagree*) to 5 (*completely agree*). All used measures mentioned were adapted for use with a Serbian population in accordance with the International Test Commission's guidelines (International Test Commission, 2017).

[4] More information on the psychometric properties of both the boredom and the sadism scale is available on the OSF.

2.1.1.3. Missing data. Overall, 156 out of 314 participants (50%) had incomplete data (i.e., missing values on one or more variables); in total, 2% of all data points were missing. Relative to the sample size, the dataset contained a large number of variables ($k = 190$).[5,6]

At the construct-level, the resulting proportion of incomplete cases was low (4%). We elected to use multiple imputation (which leads to more or equally unbiased results compared to complete-case analysis; Newman, 2014; see Madley-Dowd et al., 2019) using a bootstrapped EM-algorithm with the R-package Amelia II (Honaker et al., 2011). This technique creates multiple datasets with imputed values that fit the multivariate structure of the data. Analyses are conducted on each imputed dataset and estimates are pooled (see Enders, 2010, for a comprehensive treatment of the topic). We imputed $m = 100$ datasets to minimize loss of power (Graham et al., 2007).[7]

Overall, we applied the following missing data strategy: univariate estimates (such as means and standard deviations) were calculated using available cases. Correlation and regression analyses were conducted with imputed data and then replicated using complete cases.[8] We report the former in this article and the latter on the OSF, where we also include imputation diagnostics and additional information on missingness. Although we cannot know the precise mechanism behind the missingness, we speculate that it is partly due to participants running out of time. This is evidenced by the missingness occurring largely towards the final items (cf. OSF).

2.1.1.4. Analytic strategy. First, we computed zero-order correlations between measures of sadism and boredom. In this regard, the multitrait-multimethod (MTMM) correlations (e.g., between self-report sadism and peer-report boredom) are of special interest because they reduce common method variance (Podsakoff et al., 2003). Common method variance refers to variance attributable to the measurement method, such as demand characteristics, halo effects, and social desirability. Given that common method variance may confound the relations between constructs, controlling for it is important. To this end, Podsakoff et al. (2003, p. 887) recommended obtaining "measures of the predictor and criterion variables from different sources" as this "makes it impossible for the mindset of the source or rater to bias the observed relationship." Second, we run a multiple regression analysis to assess the relation between sadism and boredom while controlling for covariates such as the HEXACO. We did this for self-report and peer-report measures, respectively. Third, we tested the robustness of our main analyses; relevant plots, statistics, and robust alternatives are provided on the OSF (https://osf.io/4qyxs/). These additional robust analyses corroborate our main results from both studies with a single exception.[9] Finally, although participants were nested within classrooms and schools, the intraclass correlations of our main analyses from both studies were very low (ICCs <4%). As the research question and design were not tailored towards multilevel testing, we only ran single-level analyses.[10]

2.2. Results and discussion

2.2.1. Sadism

A multitrait-multimethod matrix of sadism, bullying, boredom, and the HEXACO is shown in Table 1. As predicted, boredom and sadism were significantly related on both self-report ($r = .21$, $p < .001$) and peer-report measures ($r = .34$, $p < .001$). Furthermore, the relationship remained significant when correlating self-reported sadism with peer-reported boredom ($r = .14$, $p = .012$) and vice versa ($r = .18$, $p = .001$), although the effect size was smaller when comparing across methods. Thus, the relationship between sadism and boredom persisted when controlling for common method variance.

To test the robustness of this relationship, we ran a multiple linear regression predicting sadism from boredom and included age, gender, and HEXACO scores as covariates (Table 2). Boredom did not remain a significant predictor using self-report measures ($B = 0.02$, $SE = 0.04$, $\beta = 0.02$, $p = .649$), but did when using peer-report measures ($B = 0.13$, $SE = 0.05$, $\beta = 0.15$, $p = .018$).[11]

[5] Generally, a large number of variables will render the model less stable (Honaker et al., 2011; White et al., 2011). Accordingly, Graham (2009, p. 561) concluded that "I generally try to keep the total number of variables under 100 even with large sample sizes of $N = 1000$ or more. With smaller sample sizes, a smaller number of variables should be used."

[6] As requiring half of the items to be available is somewhat arbitrary, we tested the sensitivity of this decision by comparing the correlation between sadism and boredom across different requirements for available items. The correlation coefficient was highly similar ($r = .20$ to $.25$) for any decision lying between requiring only one item (as recommended by Newman, 2014) or all items to be available (i.e., $N = 314$ to 288). The same held true for both pilot studies and for Study 2 (see OSF). In addition, we replicated our main results using the item-level data and full information maximum likelihood. These analyses are likewise available on the OSF.

[7] Graham et al. (2007) recommended choosing m from considerations of acceptable power loss compared to treating the missing data with full information maximum likelihood. Alternatively, one can justify the choice of m with the rule-of-thumb that "m should be at least equal to the percentage of incomplete cases" (White et al., 2011, p. 388). Naturally, using $m = 100$ meets this rule-of-thumb.

[8] Because reliability estimates (i.e., coefficient alpha and omega) relied on item-level data and had to be calculated within a CFA framework, we handled missing data via Full Information Maximum Likelihood estimation (Enders, 2010).

[9] In contrast to the regular original analysis, the robust analysis regressing peer-reported sadism on peer-reported boredom while controlling for the HEXACO (Study 1) revealed a non-significant effect of peer-reported boredom. All other results in both studies remained robust, and accordingly, the paper's general conclusion that boredom relates to sadism at schools did not change.

[10] Despite the low ICC, the nested data structure may still lead to underestimation of standard errors. As a robustness check, we replicated the main results in a multilevel model with random intercepts. This analysis is reported on the OSF.

[11] Although Study 1 found no significant effect of self-reported boredom when controlling for age, gender, and the HEXACO, an internal meta-analysis of the two pilots and two studies revealed an overall significant effect of $\beta = 0.22$ (see below).

Table 1
Means, standard deviations, and multitrait-multimethod matrix with McDonald's omegas (along the diagonal) of all variables (Study 1).

		Self-report									Peer-report								
	M (*SD*)	Sadism	Bullying	Boredom	H	E	X	A	C	O	Sadism	Bullying	Boredom	H	E	X	A	C	O
Self-report																			
Sadism	1.59 (0.58)	(.89)																	
Bullying	1.70 (0.63)	.69	(.81)																
Boredom	2.98 (0.84)	.21	.14	(.86)															
H	3.29 (0.72)	−.41	−.35	−.28	(.70)														
E	3.04 (0.74)	−.22	−.10	−.09	.08	(.78)													
X	3.38 (0.66)	.12	−.01	−.08	−.09	−.10	(.75)												
A	2.90 (0.62)	−.20	−.21	−.25	.25	.08	−.19	(.66)											
C	3.40 (0.67)	−.24	−.18	−.28	.13	−.04	.13	.05	(.76)										
O	3.42 (0.76)	−.11	−.01	−.25	.01	.04	−.04	.03	.25	(.79)									
Peer-report																			
Sadism	1.83 (0.81)	**.36**	.26	.18	−.25	−.14	.18	−.18	−.23	−.11	(.93)								
Bullying	1.91 (0.85)	.18	**.12**	.16	−.14	−.04	.13	−.12	−.15	−.09	.79	(.90)							
Boredom	3.02 (0.93)	.14	.03	**.40**	−.12	−.09	.01	−.04	−.31	−.24	.34	.24	(.89)						
H	3.01 (0.72)	−.20	−.16	−.18	**.30**	−.03	−.17	.13	.13	.16	−.45	−.50	−.24	(.77)					
E	3.00 (0.61)	−.27	−.17	−.16	.23	**.38**	−.03	.09	.14	.06	−.18	−.06	−.14	.07	(.72)				
X	3.29 (0.71)	.07	.04	−.03	−.11	.04	**.43**	−.12	.07	.06	.02	−.02	−.20	−.08	−.03	(.81)			
A	3.06 (0.72)	−.14	−.18	−.13	.20	−.02	−.24	**.38**	.02	.00	−.32	−.34	−.16	.42	.00	−.25	(.81)		
C	3.10 (0.80)	−0.29	−.21	−.35	.21	.15	.00	.04	**.44**	.23	−.37	−.34	−.58	.33	.29	.03	.16	(.87)	
O	3.00 (0.76)	−.22	−.11	−.23	.11	.02	−.11	.08	.25	**.51**	−.22	−.22	−.42	.27	.13	.06	.11	.51	(.81)

Note. $N = 314$. Range of all scales: 1 (*completely disagree*) to 5 (*completely agree*); H = Honesty-Humility, E = Emotionality, X = Extraversion, A = Agreeableness, C = Conscientiousness, O = Openness to experience. Pairwise $N = 304–314$. All FMIs $\leq .056$. All $|r| \geq .12$ are significant at $p < .05$. All estimates shown are pooled across imputed datasets. Bold numbers indicate self-peer report correlations of a construct.

Table 2
Multiple regression predicting sadism (Study 1).

	Self-report					Peer-report				
	B	*SE*	95% CI	β	*p*	*B*	*SE*	95% CI	β	*p*
(Intercept)	5.53	1.52	[2.54, 8.52]		<.001	3.75	0.51	[2.75, 4.75]		<.001
Boredom	0.02	0.04	[−0.05, 0.09]	0.02	.649	0.13	0.05	[0.03, 0.24]	0.15	.014
H	−0.21	0.04	[−0.29, −0.12]	−0.25	<.001	−0.35	0.06	[−0.47, −0.23]	−0.31	<.001
E	−0.02	0.04	[−0.104, 0.06]	−0.03	.558	−0.13	0.07	[−0.26, 0.00]	−0.10	.054
X	0.06	0.04	[−0.025, 0.14]	0.07	.172	−0.02	0.06	[−0.13, 0.10]	−0.01	.782
A	−0.06	0.05	[−0.15, 0.03]	−0.06	.203	−0.17	0.06	[−0.29, −0.04]	−0.15	.008
C	−0.16	0.04	[−0.25, −0.08]	−0.19	<.001	−0.14	0.07	[−0.27, −0.01]	−0.14	.042
O	0.01	0.04	[−0.06, 0.09]	0.02	.754	0.04	0.06	[−0.08, 0.16]	0.04	.542
Gender[1]	−0.46	0.06	[−0.58, −0.33]	−0.39	<.001					
Age	−0.14	0.08	[−0.30, 0.02]	−0.08	.085					

Note. $N = 314$. Range of all scales: 1 (*completely disagree*) to 5 (*completely agree*).
[1] Gender is dummy-coded as 0 = male, 1 = female; H = Honesty-Humility, E = Emotionality, X = Extraversion, A = Agreeableness, C = Conscientiousness, O = Openness to experience. Self-report: $R^2 = .38$, $F(9, 302) = 20.32$, $p < .001$, All FMIs ≤ .029. Peer-report: $R^2 = .30$, $F(7, 303.8) = 18.37$, $p < .001$, all FMIs ≤ .043. All estimates shown are pooled across imputed datasets. More supplementary analyses and diagnostics can be found on the OSF: https://osf.io/4qyxs/

2.2.2. Bullying

Bullying was highly correlated with sadism in both self-report ($r = .69$, $p < .001$) and peer-report ($r = .79$, $p < .001$). The former replicates prior research (van Geel et al., 2017), although the present effect size is much larger. The latter is consistent with previous research showing that sadistic motives are commonly attributed to bullies (Bosacki et al., 2006; Fluck, 2017). Turning to boredom's relation to bullying, boredom and bullying were significantly related in three out of four method pairings (self/self, $r = .14$, $p = .012$; peer/peer, $r = .24$, $p < .001$; self-boredom/peer-bullying, $r = .16$, $p = .005$; peer-boredom/self-bullying, $r = .03$, $p = .573$).

2.2.3. Validity

Overall, the analyses revealed a mean validity coefficient of .37 (r_1), a mean heterotrait-monomethod coefficient of .21 (r_2), and a mean heterotrait-heteromethod coefficient of .14 (r_3). Consistent with the proposed MTMM approach developed by Campbell and Fiske (1959), monotrait-heteromethod correlations (i.e., convergent validity) should be highest and heterotrait-heteromethod (i.e., discriminant validity) should be lowest; thus, the observed order of these mean correlations was as expected ($r_1 > r_2 > r_3$) and is consistent with prior research (e.g., Biesanz & West, 2004).

Most measures exhibited moderate convergence between self- and peer-report (sadism $r = .36$, boredom $r = .40$, HEXACO scales $r = .30$–$.51$). In general, convergence between self- and peer-report depends on the level of acquaintanceship between the target and the rater (Connolly et al., 2007; Paunonen & O'Neill, 2010). In this regard, the observed convergence is excellent, as most peer-raters were likely not close friends but merely classmates with their target. For comparison, ratings by parents of their own child's personality only correlate between .40 and .50 with the child's self-report (McCrae et al., 2004). In contrast to all other scales, bullying exhibited extremely low convergence ($r = .12$), consistent with previous research that compared self-reported and peer-nominated bullying (see Branson & Cornell, 2009). Overall, the moderate convergence across constructs might attenuate the relation between sadism and boredom across methods, thus making it a conservative estimate.

In sum, the results from Study 1 point to the following conclusions. First, sadism occurred in the school context but to a relatively low degree (see means in Table 1). Second, sadism and boredom were related above and beyond common method variance. For peer-reports—but not self-reports—this relationship between boredom and sadism remained significant after controlling for HEXACO personality. Third, sadism and bullying were highly correlated. In sum, the first study provides evidence that boredom might foster sadistic tendencies at schools. We want to acknowledge, however, that the correlation between boredom and sadism in this study (i.e., in the school context) is smaller than previous research has found in other contexts (e.g., online trolling or sadistic fantasies; see Pfattheicher et al., 2021) and the self-report correlations were not robust to personality controls.

3. Study 2

In Study 1, we found that boredom at school was predictive of sadistic behavior among older secondary school students, especially as reported by peers. Study 2 aimed to replicate these findings in a larger sample from six Serbian primary and secondary schools, including younger adolescents. Due to economic constraints and agreements with schools, we were limited by time constraints in study length. Therefore, we dropped measures of bullying, as well as peer-reports. Instead, we collected additional demographic information and added an exploratory measure of Disintegration (i.e., psychosis-proneness; Knezevic et al., 2017).

3.1. Method

3.1.1. Participants

We sampled 725 students across six schools (three primary schools, two general secondary schools, and one vocational secondary

school), ranging from the fifth grade of primary school to the fourth (final) year of secondary school. An a priori power analysis identical to that of Study 1 revealed a minimum sample size of 160. However, we wished to maximize power within given resources by including as many respondents as possible. One participant was excluded due to not responding to any items. The final sample thus consisted of 724 students (372 female, 332 male, 20 did not respond; M_{age} 13.68 years, $SD = 2.07$). With this sample size, we were able to detect small effects of $r > .12$ (equivalent to $\Delta R^2 > .014$ for a single regression coefficient in multiple regression analyses) with high statistical power of .90 ($\alpha = .05$, two-tailed).

3.1.1.1. Procedure and materials. The study was administered via computers in the schools' computer lab rooms. Participants first completed a 50-item demographics battery covering a diverse range of topics (see OSF). Participants then completed self-reports of boredom, sadism, and then the HEXACO-60, which were identical to those in Study 1. As in Study 1, all scales showed acceptable reliability (sadism: $\alpha = .85$, $\omega = .86$, $\omega_h = .61$; boredom: $\alpha = .87$, $\omega = .87$; HEXACO subscales: $\alpha s > .60$, $\omega s > .57$). After completing the HEXACO-60, participants completed the Serbian 20-item version of the DELTA inventory (Knezevic et al., 2017), which assesses Disintegration (i.e., psychosis proneness). Two examples of items include "I feel I can influence the course of events only by thinking a lot about them" and "Sometimes I feel as a split personality." The scale showed excellent reliability ($\alpha = .90$, $\omega = .90$).[12] As in Study 1, all measures were in Serbian and all responses (except demographics) were assessed using 5-point Likert scales ranging from 1 (*completely disagree*) to 5 (*completely agree*).

3.1.1.2. Missing data. Overall, 390 out of 724 participants (54%; excluding two items about drug use) provided incomplete data on at least one item; in total, 2% of all data points were missing. However, most of the missing data stemmed from incomplete responses on demographic variables. As such, if considering only the key measures (excluding demographics), the number of participants with incomplete cases was considerably lower at 107 students (15%). We followed the same procedures for multiple imputation as in Study 1, constructing scale scores (which yielded a 1% incompleteness rate, excluding demographics) and imputing 100 datasets. We excluded two items about drug use from the imputation model due to high missingness (approximately 60%; all other variables were $\leq$ 20%).

3.1.1.3. Analytic strategy. The analytic strategy for Study 2 was identical to that of Study 1, except for not applying multiple methods in Study 2 (i.e., we had no peer-reports in Study 2).

3.2. Results and discussion

A correlation matrix is provided in Table 3. We replicated the relationship between boredom and sadism ($r = .36$, $p < .001$) from Study 1. Although sadism was predicted by all dimensions of the HEXACO (except Extraversion) and Disintegration, the relation between boredom and sadism remained significant ($B = 0.09$, $SE = 0.02$, $\beta = 0.19$, $p < .001$), even after controlling for the HEXACO, Disintegration, and all demographic variables (Table 4).

Given that the present study is one of few to examine boredom across different age groups in adolescence, we explored the relationship between age and boredom. A correlation analysis yielded a small to moderate effect ($r = .26$, $p < .001$), suggesting that boredom at school increased slightly throughout adolescence.

In sum, Study 2 replicated the first study's finding—that students who are bored at school also engaged in more sadistic behavior—in a larger sample including younger participants (average age was 18.03 years in Study 1 vs. 13.68 years in Study 2). Indeed, the replication effect size is even larger than that observed in Study 1 and very similar in size to effects observed in previous research on boredom and sadism (see Pfattheicher et al., 2021). Furthermore, in the larger and better powered replication study, the relationship between self-reported boredom and sadism persisted even after controlling for HEXACO personality, suggesting that school boredom is a unique predictor of sadism.

3.2.1. Internal meta-analysis

To synthesize data from the two pilots and the two main studies, we conducted two random effects meta-analyses using the R-package metafor (Viechtbauer, 2010). First, we pooled the zero-order correlation coefficients between boredom and sadism, yielding an overall effect size of $r = .36$. Next, we pooled the beta coefficients of boredom as a predictor of sadism when controlling for age, gender, and the HEXACO, yielding an overall effect size of $\beta = 0.22$ (Fig. 1, and Table S12 on the OSF).

4. General discussion

The philosopher Søren Kierkegaard (1843/1987, p. 285) observed that "how corrupting boredom is, everyone recognizes also with regard to children." The present contribution delivers empirical support for this claim. We show in two studies that boredom predicts sadism at school, that is, students who are more often bored are more likely to engage in sadistic actions. This relationship emerged in both self- and peer-reports. Moreover, we observed three additional interesting findings: (a) boredom continued to predict sadism in self-reports even after controlling for personality; (b) students report that sadistic behavior does actually occur in the school context,

[12] In addition to the above constructs, we also measured Belief in a Just World for exploratory reasons. Data are available on the OSF.

Table 3
Means, standard deviations, McDonald's omegas (along the diagonal), and intercorrelations of all variables measured (Study 2).

		Correlations								
	M (*SD*)	Sadism	Boredom	H	E	X	A	C	O	D
Sadism	1.30 (0.43)	(.86)								
Boredom	2.56 (0.95)	.36	(.87)							
H	3.60 (0.67)	−.34	−.21	(.57)						
E	3.20 (0.74)	−.17	−.12	.19	(.72)					
X	3.46 (0.62)	.03	−.13	−.04	−.07	(.63)				
A	3.16 (0.63)	−.27	−.24	.30	.11	−.03	(.60)			
C	3.39 (0.66)	−.20	−.39	.17	.08	.13	.16	(.68)		
O	3.18 (0.76)	−.10	−.27	.08	.24	−.06	.11	.30	(.72)	
D	2.35 (0.81)	.24	.27	−.18	.17	−.22	−.18	−.26	.14	(.90)

Note. $N = 724$. Range of all scales: 1 (*completely disagree*) to 5 (*completely agree*); H = Honesty-Humility, E = Emotionality, X = Extraversion, A = Agreeableness, C = Conscientiousness, O = Openness to experience, D = Disintegration. Pairwise $N = 715$ to 722. All FMIs ≤0.011. All $|r| \geq .08$ are significant at $p < .05$. All estimates shown are pooled across imputed datasets.

Table 4
Multiple regression predicting sadism (Study 2).

	B	*SE*	95% CI	β	*p*
(Intercept)	1.18	0.40	[0.39, 1.97]		.004
Boredom	0.09	0.02	[0.05, 0.13]	0.19	<.001
H	−0.08	0.02	[−0.13, −0.03]	−0.12	.001
E	0.00	0.02	[−0.05, 0.04]	−0.01	.867
X	0.07	0.03	[0.02, 0.13]	0.11	.006
A	−0.07	0.03	[−0.12, −0.02]	−0.11	.003
C	−0.01	0.03	[−0.06, 0.04]	−0.02	.664
O	−0.01	0.02	[−0.05, 0.03]	−0.02	.677
D	0.08	0.02	[0.04, 0.13]	0.16	<.001
Gender [1]	−0.08	0.04	[−0.16, −0.01]	−0.10	.027
Age	0.01	0.01	[−0.01, 0.02]	0.03	.467

Note. $N = 724$. Range of all scales: 1 (*completely disagree*) to 5 (*completely agree*).

[1] Gender is dummy-coded as 0 = male, 1 = female; H = Honesty-Humility, E = Emotionality, X = Extraversion, A = Agreeableness, C = Conscientiousness, O = Openness to experience, D = Disintegration. Another 45 predictors are omitted from the table (see Table S10 on the OSF). $R^2 = .38$, $F(55, 665.7) = 7.01$, $p < .001$, all FMIs ≤.20. All estimates shown are pooled across imputed datasets. More supplementary analyses and diagnostics can be found on the OSF (https://osf.io/4qyxs/).

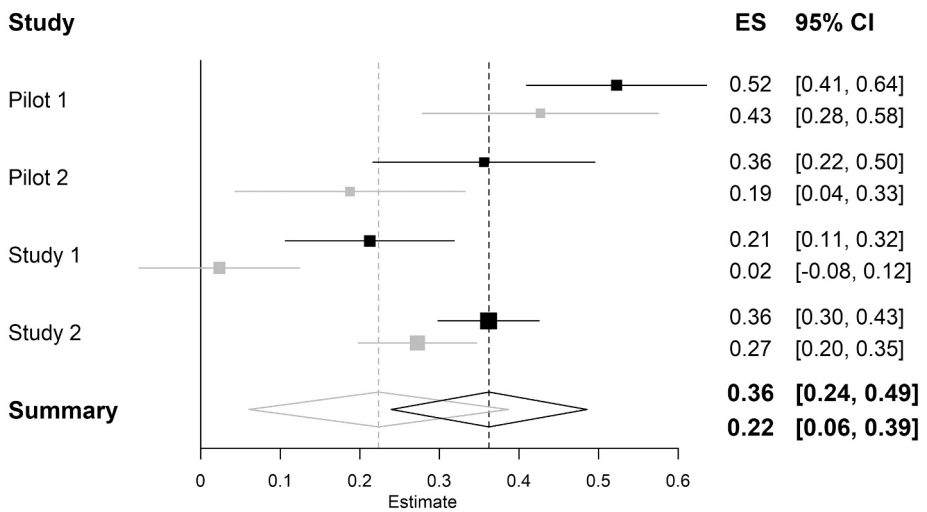

Fig. 1. Forest plot of the correlation coefficients between boredom and sadism (shown in black) and the beta coefficients of boredom predicting sadism when controlling for age, gender, and the HEXACO (shown in gray) in the two pilots and the two main studies.

albeit to a low degree; and (c) sadism at schools is not only conceptually but also empirically strongly related to bullying (*r*s = .69–.79).

These two studies have several methodological and conceptual strengths. First, we replicated the main findings in two large, high-powered independent samples, which is especially important considering the replication crisis in psychology and other disciplines. Indeed, recent concerns about reproducibility in psychological and behavioral science (Camerer et al., 2016, 2018; Open Science Collaboration, 2015) has suggested that well-powered replications should be of particular interest to the field (Brandt et al., 2014; Shrout & Rodgers, 2018).

Second, we were able to reduce concerns regarding the validity of self-reports by measuring the central constructs (i.e., school boredom and sadism) using not only self-reports but peer reports as well (as recommended by Volk et al., 2017). Doing so minimizes social desirability or response bias and demonstrates that the relationship between boredom and sadism is not solely attributable to common method variance (Podsakoff et al., 2003). Furthermore, we replicated patterns between these variables and personality traits observed in previous work, further bolstering support for our measures' validity. For instance, HEXACO dimensions have been correlated with sadism and bullying to a similar degree in prior work (Book et al., 2012; Pfattheicher et al., 2021), as has boredom (Culp, 2006). The fact that our findings are congruent with, and replicate, this past literature bolsters the validity of the present studies. Still, one has to acknowledge that we have only been testing types of validity "external" to the scale (e.g., correlations with other constructs); future research might extend this endeavor by testing other properties, for instance the validity of the internal structure of the scales.

Finally, we emphasize that our independent variable (boredom) and our dependent variable (sadism) are conceptually clearly distinct. Psychology research sometimes encounters the problem where independent variables are partially confounded with, or "flavored" by, the dependent variables, especially when similar items are used to measure both constructs. For instance, neuroticism "predicts" displaced aggression, perhaps in part because both measures contain items related to anger and hostility (i.e., angry hostility is one facet of neuroticism in Big Five models, whereas angry rumination is one facet in displaced aggression; Denson et al., 2006; Jorm et al., 2000). Thus, apparent relationships between constructs can sometimes be attributable instead to item overlap in the measures used to assess them. This is not the case for the association between boredom and sadism, neither conceptually nor in terms of measurement. Indeed, the items used to assess individual differences in school boredom have little to no overlap with those used to assess interpersonal destructiveness, or sadistic behavior, in schools. Given that boredom and sadism are conceptually distinct constructs, obtaining an effect size of $r = .36$ across samples (see internal meta-analysis) is remarkable (see Funder & Ozer, 2019, for a discussion of effect sizes in psychology). The results of the present studies have numerous implications for research on sadism and boredom and for interventions to prevent sadistic behavior at schools. In the following sections, we address these implications.

4.1. Contributions to research on boredom

Boredom occurs regularly in schools (Daschmann et al., 2011; Larson & Richards, 1991; Nett et al., 2010, 2011; Pekrun et al., 2010); bored students not only perform worse academically, but this poor performance, in turn, may lead students to feel even more bored (Putwain et al., 2018). However, somewhat surprisingly, past research has not quantified boredom's relationship with important interpersonal outcomes, such as school bullying and sadism (for an exception, see Robinson, 1975). To that end, the present studies bring much needed evidence not only regarding boredom's relationship to sadistic behavior (more generally, as found by Pfattheicher et al., 2021), but its relationship to sadistic behavior in schools, particularly among adolescents and teenagers. In this way, the present contribution addresses an important gap in showing not only that boredom is related to destructive interpersonal behaviors (i.e., harming others for pleasure), but that it does so even within important societal institutions (i.e., schools) and among younger age groups (i.e., 10–18-year-olds).

The literature on boredom has struggled with the question of whether boredom is beneficial or harmful, particularly in interpersonal contexts (Pfattheicher et al., 2021; Westgate & Steidle, 2020). The present research adds additional evidence that boredom may be associated with serious negative interpersonal outcomes (e.g., school bullying, sadism), even among younger age groups and in controlled institutional settings. However, this should not be taken as evidence that boredom is "bad." As previous research has emphasized (Westgate, 2020; Westgate & Steidle, 2020), boredom is not inherently good or bad, but rather acts as a signal that more meaningful engagement is needed. As such, boredom promotes both prosocial tendencies and destructive tendencies (Pfattheicher et al., 2021; Westgate & Steidle, 2020; Westgate & Wilson, 2018). Which behavior wins out depends in large part on which behavior a bored person picks to alleviate it, and that depends, itself, upon the alternatives available. Past research has shown that making non-destructive alternatives available prevents sadistic aggression, especially for individuals not prone to sadism to begin with (Pfattheicher et al., 2021). In the school context, for whom (and in which situations) classroom boredom translates into sadistic actions is a critical avenue for future research.

In addition, from a basic personality perspective, we were also able to predict *who* is more likely to experience boredom at school (see Table 1 and Table 3): students low in Honesty-Humility, Agreeableness, Conscientiousness, and Openness, and high in psychosis-proneness (high Disintegration). Second, and somewhat remarkably, students seem able to detect boredom in others with remarkable accuracy. To our knowledge, the present contribution reflects the very first work correlating self-reports and peer-reports of boredom. Notably, the size of the self-peer report correlation for boredom ($r = .40$) is similar to those observed for the HEXACO personality dimensions. The considerable overlap between self- and peer-reports suggests that peers can predict their fellow classmates' self-reported boredom levels, implying that the inner experience of boredom is not hidden within a person, but can be predicted (to some extent) from the outside, too.

4.2. Contributions to research on sadism and bullying

In recent years, it has been documented that sadistic motives are present in various expressions of aggressive behavior, including killing animals, online trolling, sexual aggression, vandalism, and playing violent video games (e.g., Buckels et al., 2014; Greitemeyer, 2015; Pfattheicher et al., 2019; Russell & King, 2016). Results from the present study suggest that sadistic motives also play a role when students harm others in the school context.

Earlier, we outlined the conceptual overlap between sadistic behavior and bullying—namely, that both reflect aggressive behavior occurring in the context of a power imbalance (Buckels et al., 2013; Salmivalli, 2010). For instance, pleasure has been documented in some bullying behavior (Salmivalli, 2010; see also Rigby, 2012), and previous research has found a positive correlation ($r = .36$) between self-reported sadism and bullying (van Geel et al., 2017). In Study 1, we found a very large correlation of $r = .69$ between self-reported sadism at schools and bullying and an even larger correlation of $r = .79$ among peer-reports. Given this substantial overlap, it seems reasonable to conclude that sadistic pleasure (sometimes) plays a role when it comes to bullying at schools.

It remains unclear if pleasure is the goal of such bullying, or whether it is an unintended consequence or a "positive" side effect (see Volk et al., 2014, for a similar discussion). Empirically, the present research is silent on this question; however, from a theoretical perspective, it is at least possible that pleasure is the goal of harming others, bullying included. In fact, the "hedonic principle," or goal of "approaching pleasure and avoiding pain" as the driver of human behavior, lies at the core of almost all basic motivational and affective theories (e.g., reinforcement sensitivity theory, regulatory focus theory, approach-avoidance process theories; Corr, 2004; Higgins, 1997; Smillie, 2008). Therefore, an interesting question for future research is whether and when pleasure reflects the goal or rather an unintended consequence of (sadistic) behavior, whether in school contexts or outside of it.

4.3. An applied perspective

Finally, we cautiously speculate about the applications of our findings. Previous research on boredom has highlighted the impact of situational circumstances that create attention and meaning deficits that eventually lead to boredom. Indeed, Chin et al. (2017) found that boredom was more often attributable to the situations people were in, rather than to the individuals themselves. This is in line with an ecological perspective (Baker, 1998; Bronfenbrenner & Morris, 2006; Burns, 2011) emphasizing the match between an individual's skills and the demands of their environment. Applying this perspective to the case of sadism, we can conclude that sadistic actions result from a person interacting within the (school) system. In this regard, although sadistic actions are performed by a person, they are motivated by an (boring) environment. This perception construes sadism as less of an inherent trait and more as a response to an (continuously boring) environment.

As such, a promising approach may be to change the situation students are in, and to help them in changing such situations, rather than focusing on "fixing" the student (see also Rigby, 2007). These considerations are consistent with the "work environment hypothesis" (Nielsen & Einarsen, 2018; Zapf & Einarsen, 2011), which emphasizes that destructive behavior (bullying) is at least in part the result of the work environment (i.e., the situation) that acting individuals are in. In this regard, intervention programs aimed at reducing boredom through situational changes, for instance by providing more meaningful and engaging lessons or guided and monitored sports activities, might eventually help reduce sadistic actions. In fact, the upshot for interventions against sadistic behavior is a larger focus on changing the situation surrounding the student as opposed to "fixing" the student themselves.

Utility-value interventions, for instance, focus on helping students find connections between class materials and personally valued goals and effectively boost interest and performance (Hulleman, 2010). Similarly, interest enhancement is a set of strategies to boost intrinsic interest in otherwise boring material, often involving cognitive reconstrual to make the task more meaningful, more challenging, or both (e.g., framing activities as a "puzzle", adding time limits to transform tasks into a "race"; Sansone et al., 1992). Such an approach, however, assumes that boredom causally promotes sadism at schools, which we cannot deliver support for in the two studies presented in this article (see, however, Pfattheicher et al., 2021, for causal evidence outside the school context).

4.4. Limitations and outlook

The two present studies have several methodological strengths, including the use of both peer- and self-reports, the extension of boredom and sadism research to adolescent populations, and finally, a large, well-powered internal replication of our findings. However, we also want to acknowledge limitations of the present work and point to potential future research. Perhaps the most central limitation, namely the correlational design, we have discussed previously. We note that although the present study cannot, of course, establish causality, large, well-powered, experimental designs have shown boredom to not only correlate with, but cause sadistic behavior in adults (Pfattheicher et al., 2021; Studies 6–9). Below we note four additional limitations. First and foremost, our conclusions rely (partially) on self-reports of individual differences, which were significant meta-analytically and in the larger replication sample in Study 2 (but not Study 1). Although we addressed limitations with self-reported individual differences through the use of peer-reports in Study 1 and by tailoring items to refer specifically to boredom and sadism in the school context (rather than domain-general personality differences), implementing additional assessments of actual sadistic behavior (e.g., objective indicators such as laughter and smiling when engaging in aggressive behavior) and state boredom in the moment (e.g., experience-sampling methodologies) would offer a fruitful path for future research.

Second, we imputed missing data at the construct-level for pragmatic reasons (for full rationale, see Method section of Study 1), despite evidence that imputing at the item-level is preferable in terms of power and bias (Eekhout et al., 2014; Gottschall et al., 2012; also, see Newman, 2014, for a discussion). These concerns are, however, most pronounced when data have many missing values

(Eekhout et al., 2014), whereas in the present studies only 2% of all data points were missing.

Third, one limitation of the peer-reports in Study 1 is that each student was evaluated by only one peer. Peer-report is most reliable when multiple rather than single raters provide input (McCrae, 2018). As such, we want to acknowledge the possible limited reliability of the peer report including its downstream consequences (e.g., underestimating relationships due to noise in the measure).

Fourth, almost all the literature on boredom builds on research that has been conducted in the US, UK, or Germany (with a few notable exceptions, including studies from South Africa and China). Although our studies were conducted in public schools in a western country (Serbia), participants from Serbia might not be considered a classically WEIRD sample (Western, Educated, Industrialized, Rich, and Democratic; Henrich et al., 2010). It remains unclear whether our results will hold in different countries, cultural contexts, or school traditions.

Fifth, our work remains silent regarding the boundary conditions of the relation between boredom and sadism. In fact, we did not find replicable evidence that personality (as assessed with the HEXACO personality model) functions as a moderator. As such, it remains an open question which factors of the person (e.g., biological factors, personality traits) and the situation (e.g., social norms) moderate the relation between boredom and sadism. Finally, our results do not address cyberbullying, which is a common form of internet-based bullying (Kowalski et al., 2014). Future research could explore the (causal) role of boredom in cyberbullying given that cyberbullying might reflect one sadistic way of alleviating boredom.

4.5. Conclusion

Baumeister and Campbell (1999, p. 216) argued that sadism reflects an "antidote to boredom." The present studies delivered empirical evidence consistent with this claim, showing that students who (according to their own and classmates' reports) feel more bored in school are also more likely to engage in school-based bullying and sadistic behavior. In sum, the present work contributes to a better understanding of sadism at schools and points to boredom as one potential motivator thereof. As such, the current work opens new avenues of research for studying sadistic actions that incorporate the crucial impact of boredom—in schools and beyond.

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