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**Is Male Adolescents' Sexual Aggressiveness Better Explained by Prior Pornography Use or
Callousness? A Brief Report**

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Abstract:

To address growing concerns about the role of pornography use in adolescents' sexual socialization, we explored the role of callousness, relative to pornography use, in male adolescents' self-reported sexual aggressiveness. Two competing conceptualizations of this role were tested using data from a larger longitudinal research project on sexualized media use and adolescent well-being. Considering that callousness was assessed at only two waves (T2 and T4), 381 male Croatian adolescents ($M_{\text{age}} = 15.88$, $SD = 0.49$) who participated in both waves were included in the study. Generalized mixed effects regression modeling indicated that callousness, but not pornography use, significantly predicted sexual aggressiveness 11 months later. Callousness also moderated the association between pornography use and sexual aggressiveness, so that among participants who scored high in callousness more frequent pornography use was related to lower odds of reporting sexual aggressiveness. High callousness is a risk factor for male adolescents' sexual aggression and should be addressed in prevention programs.

Key Words: Sexual aggression; adolescents; pornography use; callousness

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INTRODUCTION

Two 13-year old boys recently murdered a 14-year-old girl after one of them (boy A) had sexually assaulted her. During the trial in Dublin, which ended with both boys found guilty and sentenced to lengthy imprisonment, evidence was presented about boy A's considerable experience with pornography, including searching for highly degrading material (Stewart, 2019). The case prompted a discussion in Irish parliament about the accessibility of sexually explicit material to minors, reflecting increasing societal concerns about the role of pornography in adolescents' sexual socialization and, in particular, sexual aggression (Dawson, Tafro, & Štulhofer, 2019). Among the theories proposed to explain a potential link between the use of sexualized media and sexual aggression, Neil Malamuth's Confluence Model of Sexual Aggression, remains the most influential (Hald, Seaman, & Linz, 2014). According to the model, which has received considerable empirical support over the years (Baer, Kohut, & Fisher, 2015; Malamuth, 2018; Malamuth & Impett, 2001; Vega & Malamuth, 2007), sexual aggression is an outcome of a combination of certain personality characteristic (e.g., hostile masculinity) and high pornography use, particularly of violent, aggressive, and/or degrading content.

A different pathway to sexual aggression was suggested by Dolf Zillmann, another veteran of research into sexualized media. Based on his earlier empirical work (Zillmann & Bryant, 1982), Zillmann proposed, in an agenda setting paper published two decades ago, that frequent pornography use, but also the consumption of exploitative and sexist erotica, fuels male adolescents' sexual callousness, thereby increasing the likelihood of sexually aggressive behavior (Zillmann, 2000). Prolonged pornography use "leads to habituation of excitatory reactions" prompting the viewer to search for material "depicting less common sexual behaviors" (Zillmann,

2000: 41). This ‘escalation’ can induce dispositional changes, such as distrust in partners and the adoption of “cynical attitudes” toward the emotional dimension of sex and sexuality, resulting in “growing sexual callousness among adolescents” (Zillmann, 2000: 42). Methodological difficulties in directly exploring the link between pornography use and sexual aggression can (and should) be circumvented, Zillmann argues, by focusing on “the formation of sexual callousness” (2000: 43). As argued in a more recent study, pornography use “cultivates increasing callousness” about sexual coercion (Foubert & Bridges, 2017). To the best of our knowledge, the outlined mediation model (pornography use → callousness → sexual aggressiveness) has never been directly tested.

In contrast to this approach, in which frequent and continual pornography consumption is hypothesized to result in sexual callousness through the acceptance and internalization of sexual objectification and aggressiveness portrayed in pornographic material (see Hald et al., 2014), more recently callousness has been conceptualized as a psychopathic trait that precedes pornography use (Seto & Lalumière, 2010; Yoder, Grady, & Precht, 2019). As proposed by the Developmental Etiological Model of juvenile sexual offending, callousness is best understood as an antisocial tendency that is established in childhood as a combination of personality predisposition(s) and neglect, abuse, and/or sexual victimization (Knight & Sims-Knight, 2003, 2004). Given that later in the development it is often found related to sexual preoccupation and highly sexualized behavior (Knight & Sims-Knight, 2004), callousness should be related to both pornography use and sexual aggressiveness.

Study Aims

The current study examined the role of male adolescents’ callousness, relative to their pornography use, in self-reported sexual aggressiveness. To this aim we compared the two conceptual pathways to male adolescents’ sexual aggressiveness, in which callousness plays a

distinct but structurally different role. The difference is specified in the following two hypotheses:

H1 – Following Zillmann’s conceptualization, callousness is expected to mediate the association between pornography use and sexual aggressiveness; controlling for callousness will render the association between pornography use and sexual aggressiveness non-significant.

H2 – Following the Developmental Etiological Model (Knight & Sims-Knight, 2004), callousness and not pornography use would predict sexual aggressiveness. Furthermore, an interaction between callousness and pornography use is expected, whereby highly callous adolescents who use pornography frequently would be characterized by a higher risk of sexual aggression than their highly callous peers who use pornography less often. Informed by Malamuth’s work (Malamuth, 2018; Malamuth & Impett, 2001; Vega & Malamuth, 2007), this additional expectation explores the existence of a cumulative risk component in the Developmental Etiological Model.

METHOD

Participants and Procedure

Data from this study were drawn from the PROBIOPS project (for details see Kohut & Štulhofer, 2018), a large-scale 6-wave longitudinal study ($n_{T1} = 1,287$) that focused on sexualized media use and adolescents’ sexual and reproductive health, and well-being. Because callousness was assessed at only two waves (T2 and T4) 11 months apart, 381 male adolescents ($M_{\text{age at baseline}} = 15.88$, $SD = 0.49$) from 14 (of 22) high schools in Rijeka (the third largest city in Croatia) who participated in both study waves were included. Regarding baseline sample characteristics, participants’ age ranged from 15 (18.3%) to 18 years (0,6%), with a great majority (76.1%) reporting the age of 16. Most of participants were living with both parents at the time of the survey (78.8%) and over a third (37.6%) had at least one college educated parent. In terms of

religiosity, 7.3% of participants reported regular weekly church attendance. While the majority of their peers (43.9%) attended religious ceremonies several times a year, 15.2% reported that they never attend them. About a fifth of participants (21.5%) had their first sexual intercourse prior to the initial study wave. Daily pornography use was reported by 23.9% of participants, with additional 36.6% using it at least once a week. Only 9.3% of participants reported no pornography use in the past six months.

Pen and paper surveying in the Rijeka panel was carried out during school hours and under the supervision of a research assistant. Privacy screens were placed between students to maximize confidentiality. As stipulated by national guidelines for ethical research in minors, parents were informed about the study aims prior to the study launch; participants were asked to provide informed consent at each study wave. All procedures were approved by the Ethical Research Committee of the University of Zagreb.

Measures

Sexual aggression was assessed with a single-item general indicator that was previously used in research involving adolescents (Ybarra, Mitchell, Hamburger, Diener-West, & Leaf, 2011): “How many times (in the past 6 months) have you kissed, touched, or done anything sexual with another person when that person did not want you to do so?” Responses were “never,” “once,” and “several times.” Following Ybarra et al. (Ybarra et al., 2011), responses were dichotomized into 1 = never and 2 = at least once.

Pornography use was defined in the questionnaire as *any material which openly depicts sexual activity; material which shows naked bodies but not sexual intercourse or other sexual activity does not belong to pornography as here defined*, and measured with a single-item asking about the frequency of use in the past 6 months. Response options were: 1 – “not once”, 2 – “a few times”, 3 – “once a month”, 4 – “2-3 times a month”; 5 – “once a week”, 6 – “several times a

week”, 7 – “every day or almost every day”; and 8 – “several times a day”. The current study’s use of a single-item indicator of pornography use is consistent with the literature that supports the use of single-item indicators in cases when the construct in question is commonly and uniformly recognized (see Bergkvist & Rossiter, 2007; Diamantopoulos, Sarstedt, Fuchs, Wilczynski, & Kaiser, 2012). This has been recently supported by a meta-analysis that found no difference in the associations between pornography use and sexual satisfaction reported in studies which used a single-item measure of pornography use and those that relied on a composite indicator (Wright, Tokunaga, Kraus, & Klann, 2017).

Callousness was assessed by the 8-item callousness factor from the 3-dimensional Callousness-Unemotional Traits measure (Kimonis et al., 2008). Originally, the callousness factor consisted of nine items, but the last item was omitted because it loaded moderately on two latent dimensions. The 8-item measure had acceptable internal consistency in the current study (Cronbach’s α at T2 and T4 was 0.74 and 0.70, respectively), but an exploratory factor analysis demonstrated that the measure was two-dimensional. Thus, only five items (e.g., “I do not care who I hurt to get what I want”; “I don’t feel remorseful when I do something wrong”; “The feelings of others are unimportant to me”) that loaded highly on the first factor were retained (Cronbach’s $\alpha_{T2} = 0.78$ and $\alpha_{T4} = 0.74$). Their scores were averaged into a composite indicator, with higher scores denoting higher callousness.

Analytical Strategy.

Generalized (logistic) mixed effects regression modeling in R-based jamovi statistical software package (the jamovi project, 2019) was used to explore whether pornography use and callousness at T2 predicted sexual aggressiveness at T4. The analysis included all available data and only the above described measures; no undocumented data manipulation was involved. The regression model was sequential, with pornography added in the first step, callousness in the

second, their interaction in the third, and autoregressive component (i.e., sexual aggressiveness at T2) entered in the final step. Considering that testing true mediation requires at least three study waves (Little, 2013), finding a significant association between pornography use and sexual aggressiveness in the first step was the prerequisite for provisional exploration of the mediating role of callousness (Baron & Kenny, 1986). Due to data clustering, random intercept for 14 participating schools was included in all models.

RESULTS

The percentage of sexually experienced participants steadily increased from baseline. At T2, 26.8% of participants reported sexual intercourse, while the percentage at T4 was 36.5%. In contrast, we observed no increase in the proportion of adolescents who reported sexual aggressiveness. It changed from 14.0% at baseline to 13.8% at T2, and 7.9% at T4. To explore bivariate relationships between the key constructs, mean levels of pornography use were compared among participants with low, medium, and high callousness (for this analysis only, the indicator was tertiled into three similarly sized categories). Mean frequency of pornography use was 4.54 (95% CI = 4.23-4.85), 5.19 (95% CI = 4.88-5.50) and 5.32 (95% CI = 4.98-5.65), respectively. The low callousness group reported a significantly lower frequency of pornography use than the medium and high callousness groups ($F_{(2, 371)} = 6.66, p = .001$). When pornography use, callousness, and sexual aggressiveness at T2 and T4 were cross-correlated, significant associations were more consistently observed between callousness and sexual aggressiveness (3/4 correlations reached significance) than between pornography use and sexual aggressiveness (1/4 correlations). Pornography use and callousness were significantly and positively related in three of four cases. All the significant cross-correlations were small, ranging from .11 to .19 (Table 1).

*** TABLE 1 ABOUT HERE ***

Next, a multivariable generalized logistic mixed effects regression analysis was carried out with pornography use at T2 predicting the outcome at T4. Pornography use did not significantly predict the outcome—unlike callousness, which was associated with higher odds of reporting sexual aggressiveness ($b = 0.55, p = .017$). It should be noted that the absence of a significant relation between the frequency of pornography use and the outcome disconfirmed the first hypothesis.

In addition, we observed a significant association between the outcome and pornography use x callousness interaction term ($b = -0.31, p = .009$). Differential variability in callousness and pornography use did not seem to have biased the estimates. After both indicators were standardized, callousness remained significantly associated with sexual aggressiveness ($\beta = .46, p = .016$), in contrast to the frequency of pornography use ($\beta = -0.19, p = .346$). Changes in the percentage of variance in the outcome explained at individual level indicate that substantive predictive improvements were related to the moderation effects and, particularly, to the inclusion of earlier sexual aggressiveness (see Table 2).

*** TABLE 2 ABOUT HERE ***

Simple slope analysis of the moderating effect of callousness on the association between pornography use and sexual aggressiveness demonstrated that the risk of sexual aggressiveness among adolescents who scored high in callousness (reported sexual aggression was the highest in this group of participants) was substantially lower if they used pornography more frequently (see Figure 1).

*** FIGURE 1 ABOUT HERE ***

Adding autoregressive component further improved model fit (Model D), but did not alter the pattern of significant findings. To control for self-reporting, social desirability was assessed at T2 and T4 with an 11-item short version of the Marlowe-Crowne Social Desirability scale

(Reynolds, 1982). The composite indicator, which had moderate reliability ($\alpha = .64$) and test-retest validity ($r = .57$), was included in the final regression modeling step (not shown in Table 2). The inclusion neither changed the pattern of significant findings, nor substantially affected effects sizes. Social desirability was not significantly associated with the dependent variable ($b = -0.06$, $S.E. = 0.09$, $p = .505$).

When the proportion of explained variance in the outcome was transformed into Cohen's f^2 effect size metric (Selya, Rose, Dierker, Hedeker, & Mermelstein, 2012), the effect of the four independent variables included in the final model was found to be small ($f^2 = 0.022$). Almost half of the effect was contributed by previous levels of sexual aggressiveness. Finally, the pattern of significant associations remained unchanged when the analysis was repeated with the full 8-item measure of callousness, suggesting that the findings were robust.

DISCUSSION

The current study explored the role of male adolescents' callousness, relative to their frequency of pornography use, in predicting sexual aggressiveness. Callousness has been consistently implicated in the development of aggressive behavior (Docherty, Beardslee, Byrd, Yang, & Pardini, 2019; Fanti, Frick, & Georgiou, 2009; Winiarski, Engel, Karnik, & Brennan, 2018), including sexual aggression (Cardona, Berman, Sims-Knight, & Knight, 2018), but has not been systematically addressed in the context of potentially adverse outcomes of pornography use. Using a repeated measurement design, we found that callousness levels measured at the first data collection wave predicted self-reported sexual aggressiveness 11 months later. However, the size of the association, which confirmed the hypothesis informed by the Developmental Etiological Model (Knight & Sims-Knight, 2004), was small. Pornography use did not significantly predict the outcome, either with or without controlling for participants' callousness, which led to the rejection of the hypothesis based on Zillmann's (2000) theorizing. The finding

that callousness interacted with pornography use, but in the manner opposite from what was expected (the risk of self-reported sexual aggressiveness was substantially lower among the highly callous students who used pornography more often, compared to those who used it less often), goes against the cumulative risk addition to the Developmental Etiological Model.

The role of callousness in a possible relationship between adolescent pornography use and sexual aggressiveness was operationalized as a mediating vs. direct and/or moderating effect, reflecting the two distinct conceptualizations of callousness in the literature on juvenile sexual offending. We observed that male adolescents who were characterized by higher callousness were more likely to self-report sexual aggression than their less callous peers, but found no support for the mediating role of callousness. Considering the fairly consistent positive links, albeit of small size, between callousness and pornography use at bivariate level and the absence of a longitudinal link between pornography use and sexual aggressiveness, the findings do not support Zillmann's (2000) conceptualization of callousness. Instead, they corroborate the notion that callousness likely influences both pornography use and sexual aggressiveness, which is compatible with the Developmental Etiological Model (Knight & Sims-Knight, 2004).

According to the second hypothesis, callousness was also expected to qualify the link between pornography use and sexual aggressiveness. The observation that the odds of self-reported sexual aggression were not the highest among participants who scored high in both callousness and pornography use, is at odds with the proposed extension of the Developmental Etiological Model. It is possible that for those high in callousness frequent pornography use served as an outlet for fantasies about impersonal sex, resulting in lower levels of real life (sexual) aggressiveness. Alternatively, it may be that more frequent pornography use made these male adolescents less likely to interpret some of their behavior as unwanted or non-consensual. In other words, we cannot rule out the possibility that frequent pornography consumption may have

influenced adolescents' perceptions of sexual consent (or a lack of it), effectively desensitizing them to exploitative and/or coercive sex (Hald et al., 2014). With the data available, neither speculation could be verified. It should be noted that each of them is compatible with the idea that callousness is an outgrowth of pornography consumption (Hald et al., 2014; Zillmann, 2000), as well as the notion of callousness as a psychopathic trait (Knight & Sims-Knight, 2004).

The strongest predictor of sexual aggressiveness in our model were levels of sexual aggressiveness at previous measurement. Considering that autocorrelation is the standard observation in longitudinal research for both empirical and methodological reasons, caution is warranted when interpreting this finding. From a clinical perspective, this relative consistency of sexual aggressiveness in middle to late adolescence suggest that intervention efforts should be initiated following first occurrences of sexually aggressive behaviors, rather than delayed until such behavioral pattern is established.

The findings need to be weighed against a few limitations. First, our measure of sexual aggressiveness was non-specific, covering a broad range of coercive erotic or sexual behaviors. The same approach was used in an earlier study that explored U.S. adolescents' pornography use and sexual aggression (Ybarra et al., 2011). Although it is likely, considering participants' age, that the majority of self-reported acts were less rather than more traumatizing, this approach may have obscured some behavior-specific associations. Secondly, we did not assess specific pornographic content consumed by participants (i.e., whether violent or coercive material was used). Such information would be highly informative, but problems with measuring pornographic content (Hald & Štulhofer, 2016; Hald, Štulhofer, & Lange, 2018; Landripet, Buško, & Štulhofer, 2019) and difficulties in obtaining ethical approval to ask about it in research with minors remain the common obstacles. Thirdly, we were unable to find any measure of sexual callousness in the literature (the Rape Callousness Scale, developed by Bell et al. (1992) taps into myths, or

incorrect beliefs, about rape and not sexual callousness as defined by Zillmann). Thus, general, and not sexual, callousness was assessed in the study, which is a limitation for testing Zillmann's proposal. Zillman himself assessed sexual callousness using a proxy (Zillmann & Bryant, 1982)—a version of Mosher's Aggressive Sexual Behavior Inventory, the measure "developed to measure sexual aggression by men against women" (Mosher, 2011: 42). It should be noted that this measurement strategy precludes the mediation analysis proposed by our first hypothesis, because it renders the mediating construct (sexual callousness) and the outcome (sexual aggression) indistinguishable.

Fourthly, the fact that callousness was measured only twice precluded true mediation testing (Little, 2013) and may have reduced the precision of our assessment. Finally, as shown by another set of analyses from the PROBIOPS research project, a systematic dropout of participants who seemed to have been most vulnerable to pornography use took place between waves T1 and T2 (Štulhofer, Matković, Kohut, Koletić, Buško et al., 2020). This may have affected our findings by attenuating the associations of interest, because the authors found that female and male adolescents who were characterized by adverse family environment, lower academic achievement, early biological maturation (early pubertal onset), lower self-esteem, and earlier sexual debut were more likely to leave the study than their peers. However, the effect was restricted to early attrition—i.e., to leaving the study after the initial wave.

Notwithstanding the limitations, this study's findings contribute to the literature that explores potential links between adolescents' pornography use and sexual aggression. In this empirical assessment of the role of callousness, we found that it directly predicted subsequent self-reported sexual aggressiveness. Callousness, rather than pornography use, should be systematically addressed as a part of sexual aggression prevention. The current study also found that callousness moderated the association between pornography use and sexual aggressiveness in

a way that suggests a possible ‘safety valve’ role of pornography use (Diamond, 2009) in adolescents scoring high in callousness. Alternatively, frequent pornography users may be less likely to interpret some of their sexual behavior as unwanted or non-consensual due to internalized pornography scripts (Wright, Tokunaga, & Kraus, 2016). Future research should explore these conflicting tentative explanations in more detail. Additional research is also needed to ascertain to what extent may the reported findings be culture- and/or developmentally-specific.

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Figure 1 – Simple Slope Analysis of the Moderating Role of Callousness in the Association between Male Adolescents’ Pornography Use and Sexual Aggressiveness

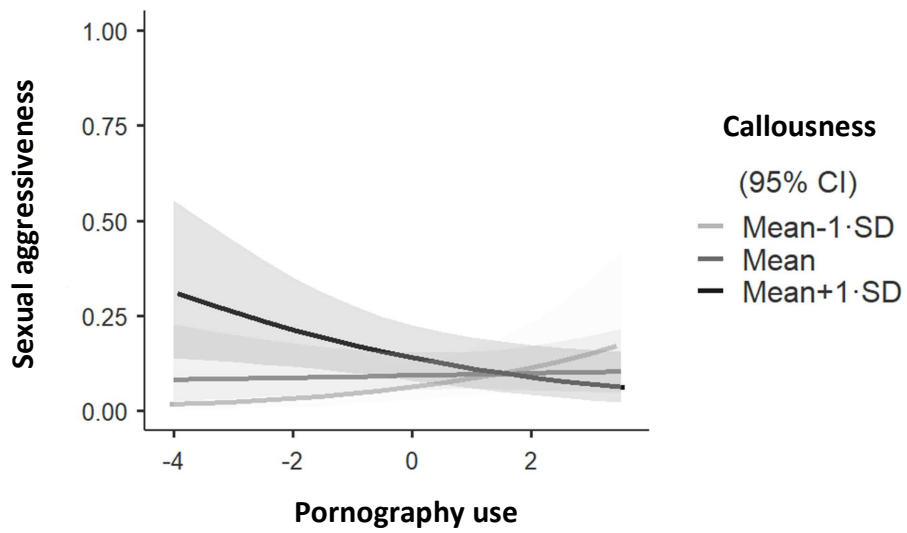


Table 1 – Descriptive Information about and Cross-Correlations between the Key Indicators

	A	B	C	D	E	F	
		<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>M</i> (<i>SD</i>)
		<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>	range
A - Callousness at T2		0.48	0.18	0.10	0.06	0.12	1.95 (0.82)
		<.001	<.001	0.056	0.205	0.018	1-5
B - Callousness at T4			0.18	0.18	0.19	0.12	2.01 (0.75)
			<.001	<.001	<.001	0.012	1-4.20
C - Pornography use at T2				0.68	0.11	-0.01	5.01 (2.16)
				<.001	0.010	0.792	1-8
D - Pornography use at T4					0.09	0.08	4.91 (2.15)
					0.092	0.094	1-8
E - Sexual aggressiveness at T2						0.15	1.14 (0.34)
						0.004	1-2
F - Sexual aggressiveness at T4							1.08 (0.28)
							1-2

Table 2 – Adolescents’ Pornography Use and Callousness as Predictors of Sexual Aggressiveness
11 Months Later ($n = 372$)

	Model A		Model B		Model C		Model D	
	<i>b</i>	SE	<i>b</i>	SE	<i>b</i>	SE	<i>b</i>	SE
Icept.	-2.51***	0.23	-2.59***	0.24	-2.61***	0.24	-2.28***	0.28
Pornography use	-0.04	0.09	-0.07	0.09	0.03	0.11	0.04	0.12
Callousness			0.55*	0.23	0.56*	0.04	0.60*	0.27
Pornography use x callousness					-0.31**	0.12	-0.36**	0.13
Previous levels of sexual aggressiveness							1.32**	0.47
R^2 marginal (ΔR^2)	0.03		0.05 (0.02)		0.12 (0.07)		0.20 (0.08)	
Log-likelihood	-102		-99		-95		-88	
AIC / BIC	209 / 221		206 / 221		200 / 220		187 / 211	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$