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The association of polyvictimization with violent ideations in late adolescence and early adulthood: A longitudinal study

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Abstract

Violent ideations are increasingly recognized as an important psychological predictor for aggressive and violent behavior. However, little is known about the processes that contribute to violent ideations. This paper examines the extent to which polyvictimization triggers violent ideations in late adolescence and early adulthood, while also adjusting for dispositional and situational factors as well as prior violent ideations. Data came from three waves of the Zurich Project on the Social Development from Childhood into Adulthood (z-proso; $n = 1465$). Full-information maximum likelihood Tobit models were fitted to regress violent ideations experienced at ages 17 and 20 on multiple victimization experiences in the preceding 12 months while controlling for antecedent developmental risk factors and prior violent ideations. The results showed that violent ideations in late adolescence and early adulthood are influenced by violent thoughts, aggressive behavior, violent media consumption, moral neutralization of violence, and internalizing symptoms measured 2 years earlier. Experiences of polyvictimization significantly contributed to an increase in violent ideations both during late adolescence and in early adulthood. The exposure–response relationship between victimization and violent ideations did not significantly differ by sex. The findings are consistent with the notion that violent ideations are triggered by a retaliation-linked psychological mechanism that entails playing out other directed imaginary aggressive scenarios specifically in response to experiencing intentional harm-doing by others.

KEYWORDS

adolescence, early adulthood, polyvictimization, revenge, violent ideations

1 | INTRODUCTION

Although the relationship between victimization and the emergence of externalizing and internalizing behavior problems is well-established, the effects of victimization on the more proximal cognitive and affective functioning of young people are still not fully understood (Averdijk et al., 2016; Barchia & Bussey, 2010; Bartolo et al., 2009; Lee & Hoaken, 2007). Victimization has been suggested to affect various cognitions that can heuristically be grouped into self-related and other-oriented cognitions (Kunst, 2011). Effects of

victimization on self-related cognitions include lower self-esteem, a reduced sense of having control over one's life, feelings of humiliation and rejection, self-blame, shame and guilt, psychological distress, sadness ruminations, suicidal ideations, and depression (Barchia & Bussey, 2010; J. Jackson & Gouseti, 2016; Lopez & DuBois, 2005; Turner et al., 2017). Effects of victimization on other-related cognitions include anger and anger rumination, resentment, hypervigilance to aggressive stimuli, hostile attributions, vengeful thoughts, and feelings of injustice (Manasse & Ganem, 2009; Orth et al., 2006).

The present study focuses on an under-researched yet possibly crucial cognitive process in pathways from victimization to violence, namely thoughts, daydreams, or fantasies of inflicting harm on or killing another individual, that is, violent ideations (Murray et al., 2018). The lifetime prevalence of homicidal ideations is high among young adults. Around 50%–80% of university students report at least one fantasy of killing another person in their life (Auvinen-Lintunen et al., 2015; Crabb, 2000; Kenrick & Sheets, 1993). Over shorter reference periods, prevalence estimates are lower, but violent ideations still affect substantial proportions of the population. Grisso et al. (2000), for example, found that 14% of a community sample of adults experienced daydreams or thoughts about physically hurting other people in the past 2 months. In a large normative sample of 17 year olds (Murray et al., 2018), 13% of respondents reported having had thoughts of killing a person they know in the preceding month, while 36% reported thinking about violently getting back at someone who harmed them. Men tend to recall more violent ideations than women, and their violent fantasies are longer and more detailed as compared with those of women (Kenrick & Sheets, 1993).

However, there is a gap in research on the developmental antecedents of violent ideations in general, and on the role of victimization for violent ideations more specifically. In fact, we are not aware of any longitudinal study that has examined whether victimization predicts violent ideations, and whether the association changes during the transition from adolescence to adulthood. Thus far, only one cross-sectional study exists on this topic (Uusitalo-Malmivaara, 2013). This study of 779 sixth-graders in Finland found that victimization by both adults and peers was associated with more violent ideations. However, the measure of violent ideations in this study combined items on self-directed and other-directed aggression, which are likely motivated by different mechanisms. In addition, the study did not control for underlying aggressive tendencies, which limits the strength of its conclusions, because aggression may affect both the risk of victimization and the likelihood of aggressive fantasies. Finally, this previous study was unable to determine causal ordering due to its cross-sectional design.

1.1 | Study rationale and design

The primary goal of the present study was to examine whether being the victim of multiple forms of intentional interpersonal harm is associated with an increase in violent ideations during late adolescence and early adulthood in a large community sample. We used a broad index of polyvictimization that comprises serious criminal violence, peer victimization, verbal and physical parental aggression, and dating violence. This allowed us to examine the hypothesis that polyvictimization has an exposure–response relationship with violent ideations (Gerlsma & Lugtmeyer, 2018). We also controlled for the effects of adverse life events other than victimization on violent ideations. This allowed us to test whether violent ideations are affected specifically by experiences of intentional interpersonal harm, or by strain and aversive experiences more generally (Groves & Anderson, 2018; Kunst, 2011). Furthermore, we investigated whether the effects of victimization on ruminations about killing or attacking others become less pronounced during the transition to adulthood, possibly reflecting psychosocial maturation and higher emotion regulation capacities linked to brain development at that age (Shulman et al., 2015). Finally, we examine whether the effects of victimization vary between males and females. This allows us to advance knowledge relating to sex differences in how cognitions respond to experiences of interpersonal harm, which, in turn, may help explain sex differences in behavioral effects of victimization (du Pont et al., 2018; Peled & Moretti, 2010).

Studies that can provide the best evidentiary support for the hypothesized effects of victimization on violent ideations in real-life circumstances require longitudinal data with a clear temporal order between the victimization experience and the putative outcome. They also require data on antecedent dispositional characteristics, behaviors, and life circumstances that are likely to account for between-individual differences in the tendency to experience violent ideations. In this study, we use three waves of a large community-based longitudinal study with data collections at ages 15, 17, and 20. We separately examine predictors of violent ideations at ages 17 and 20. In each wave, participants reported recent violent ideations experienced during the past 30 days. In contrast, the polyvictimization measures refer to victimization reported in the past 12 months. This creates a plausible temporal sequence from victimization to violent ideations, even if we cannot exclude the possibility of reverse causation.

To account for developmentally stable, between-individual differences, our models include theory-based predictors of violent ideations assessed in the respective preceding wave, that is, at ages 15 and 17. Measures of antecedent violent ideations account for rank-order stability in the tendency to have violent ideations (Murray et al., 2016). Measures of aggressive behavior take the hypothesis into account that violent ideations may be part of a wider trait aggressiveness (P. F. Tremblay & Dozois, 2009). Measures of violent media consumption capture the expectation that violent media contents contribute to the salience and accessibility of aggressive scripts (Bushman & Huesmann, 2006). Measures of the moral neutralization of violence allow for the social-cognitive hypothesis that lowering inner moral restraints on violence makes cognitions of violent behavior options more readily available (Anderson & Bushman, 2001; Bandura et al., 1996); and, finally, measures of antecedent depressive symptoms incorporate evidence

that hostile and ruminative style of thoughts can be a symptom of depression (Mor & Winquist, 2002).

2 | METHODS

2.1 | Participants

This study used data from the Zurich Project on Social Development from Childhood to Adulthood, z-proso (Eisner & Ribeaud, 2007). The z-proso project is a longitudinal study on the development of antisocial and prosocial behaviors with a particular focus on aggression and violence. Participants were initially recruited in 2004 among all children who attended year 1 in one of 56 primary schools in Zurich, Switzerland. The schools were randomly selected using a stratified sampling procedure that oversampled disadvantaged school districts, resulting in a total target sample of 1675 children.

The study was conducted in accordance with national and international ethical standards, and was approved by the Ethics Committee of the Faculty of Arts and Social Sciences of the University of Zurich. From age 13, participants provided active written informed consent. From age 13 to 15 parents could opt their child out of the study. Informed consent from the participants was obtained in accordance with national regulations, and all data have been processed and stored according to data protection regulations.

The study currently comprises seven waves of child interviews at ages 7, 8, 9, 11, 13, 15, 17, and 20. In the present analyses, we use data from the data collections at ages 15, 17, and 20, because the measures of interest were collected in these waves; 84.7% of the initial target sample participated at age 15 ($n = 1447$), 78.0% ($n = 1306$) participated at age 17, and 70.4% ($n = 1180$) participated at age 20. At ages 15 and 17, the data collection was primarily based on paper and pencil questionnaires administered in temporary data collection centers specifically established for the study. At age 20, the data collection was conducted via self-completed computer-aided questionnaires in a lab at a central location in Zurich. The sample is ethnically diverse: 36.5% of the parents were born in Switzerland, followed by former Yugoslavia (17.7%), Portugal (5.7%), Sri Lanka (5.6%), Turkey (4.6%), and Germany (4.0%).

2.2 | The dependent variable

Violent ideations at ages 17 and 20 were measured with the Violent Ideations Scale (VIS). The VIS is a psychometrically validated 12-item instrument (Murray et al., 2018). Participants were asked to estimate how often they had thoughts about committing violent acts during the past month, using a 5-point scale from 1 (*never*) to 5 (*very often*). The items measure thoughts of lethal and nonlethal violence against others such as "beating up somebody I find totally repulsive," "killing a person who humiliated or offended me," or "using violence to get back at someone who harmed me." The aggressive acts represented in the items vary in the target referred to (e.g., a stranger, a person close to the respondent, a person despised by the respondent), the seriousness of the violent fantasy (e.g., humiliating, beating, killing someone), and whether they are provoked or unprovoked (e.g., thinking about violence against someone who harmed me vs. hitting somebody for no particular reason). The internal consistency of the scale is high (Cronbach's $\alpha = 0.91$ at age 17 and 0.90 at age 20).

The psychometric assessment (Murray et al., 2018) of the scale suggests unidimensionality of the included items, only minor measurement differences between male and female respondents, and a strong relation to concurrent measures of criminal violence and aggressive behavior (Murray et al., 2017).

2.3 | Measures of victimization and adverse life experiences

Polyvictimization was measured by creating a cumulative victimization score that mainly comprises experiences of direct interpersonal physical and psychological harm. Items were recoded into a dichotomy of 0 (did not experience victimization) and 1 (did experience victimization), then summed up (Obsuth et al., 2018). At age 17, the cumulative score was based on 23 items. It comprises five items of peer victimization (e.g., insulted or taunted, physically attacked, sexually harassed) in any social context (Murray et al., 2021); five items of criminal violent victimization such as assault leading to injury with or without a weapon; four items that measure aggressive parenting including yelling, slapping, and hitting; and 10 items that measure physical or sexual dating violence victimization (e.g., bit or kicked, pressure to have sex against one's will).

Respondents reported experiences in the past 12 months before the survey, with the exception of the items on parental aggression, where no timeframe was provided. At age 20, parental aggression was no longer measured; hence, the maximum number of items was 19. At age 17, 93.8% reported at least one victimization, and cumulative scores ranged from 0 to 15. At age 20, 72.3% of the participants reported at least one victimization, and cumulative scores ranged from 0 to 13.

Adverse life events were measured as a cumulative score of 21 dummy-coded negative life events experienced by the participant in the year before the survey. Events include failing an exam, being excluded from school, leaving home, serious illness or death of a family member or friend, financial problems and unemployment of a parent, and parental separation. The list of life events was developed on the basis of similar previous instruments (Aseltine et al., 2000). Responses for the last two 6-month periods were combined and then a sum index was constructed at ages 17 and 20. Scores ranged from 0 to 6 at age 17 and from 0 to 8 at age 20.

2.4 | Antecedent and control variables

Sex and family socio-economic status (SES) were included as control variables. Family SES was represented by the International

Socio-Economic Index of Occupational Status (ISEI) of the parental caregivers and based on the information on occupation and education of the parents.

Violent ideations at age 17 were included as a predictor in the model for violent ideations at age 20. At age 15, the full violent ideations measure was not available. Instead, antecedent *aggressive thoughts* were measured with a shorter scale of four items. They tap reactive aggression, instrumental aggression, relational aggression, and serious physical aggression (homicide). Three of the items were administered as part of a judgment and decision-making measure. For example, respondents were asked how often they had thought, in the past month, about hitting a person who had been mean to them. Responses were given on a response scale from 1 (*never*) to 4 (*almost daily*). A scale score was computed by averaging the responses on the items (Cronbach's $\alpha = 0.57$).

Antecedent *aggressive behavior* was measured with an 18-item scale based on the Social Behavior Questionnaire by R. E. Tremblay et al. (1991) and validated for the current sample (Murray et al., 2019). The scale is based on the average score. It combines items relating to proactive aggression, reactive aggression, physical aggression, indirect aggression, and oppositional aggression against authority figures. Responses were given on a five-level response scale ranging from *never* to *very often*. The internal consistency of this scale was Cronbach's $\alpha = 0.87$ and 0.85 at ages 15 and 17, respectively.

Violent media usage (at ages 15 and 17) was measured with an average score of six items relating to the frequency of engaging with violent contents on television, on the Internet, and on mobile telephones. Responses were given on a 7-point scale from 1 (*never*) to 7 (*daily*). The internal consistency of this scale was Cronbach's $\alpha = 0.80$ and 0.75, respectively, at ages 15 and 17.

Moral neutralization of violence was measured with the Moral Neutralization of Violence Scale (Ribeaud & Eisner, 2010). This 18-item scale measures cognitive distortions related to violent behavior that help individuals overcome the dissonance between moral standards and their own behavior. Items include statements such as "it is alright to fight to protect your friends," "it's ok to get into a physical fight with someone if they hit you first," or "it's ok to pick on losers." Responses were given on a 4-point response scale (Cronbach's $\alpha = 0.90$ at ages 15 and 17).

Internalizing symptoms (at ages 15 and 17) were measured with an 8-item scale that comprised symptoms of anxiety and depression based on the Social Behavior Questionnaire (R. E. Tremblay et al., 1991). The scale was formed as the mean of the items. The internal consistency of this scale was Cronbach's $\alpha = 0.80$.

2.5 | Missing values

We estimated separate models for violent ideations in late adolescence (age 17) and early adulthood (age 20). For each model, all cases were included that contributed information because respondents had participated in the respective wave or the preceding wave ($n = 1464$ at age 17 and $n = 1368$ at age 20). An analysis of attrition patterns suggests that participants at age 17 were representative of the initial target sample, although there was a slightly overproportional loss of participants of an immigrant background (Eisner et al., 2018).

In subsequent analyses, we report results from analyses using a full-information maximum likelihood (FIML) approach. FIML estimators produce unbiased estimates provided data are missing at random, and are superior to a number of ad-hoc techniques of addressing missingness (Enders & Bandalos, 2001).

2.6 | Analytical procedure

Initial examination of the dependent variables showed that the scores of the violent ideation scale were highly skewed with skewness = 2.63 (*SE* = 0.07) and skewness = 3.44 (*SE* = 0.07) at ages 17 and 20, respectively. Moreover, the scales were left-censored, with 40.0% of the mean scores at age 17 and 59.8% of the mean scores at age 20 having values of zero (*never*).

Several methods are available to analyze nonnegative continuous variables that are highly right skewed and have a large proportion of zeroes (D. A. Smith & Brame, 2003). Here, we adopt an analytic strategy based on Tobit regression models (Tobin, 1958). Tobit models are designed to estimate linear relationships in cases where the observed values are censored, that is, variation below a threshold level exists but cannot be observed in the data (D. A. Smith & Brame, 2003). In the case of violent ideations, censoring may have occurred due the short reference timeframe of 1 month (i.e., violent thoughts occurring at frequencies of less than a month are reported as *never*) and due to a lack of items in the VIS scale that capture aggressive ideations at low levels of intensity. We used MPlus version 8.0 to fit these models (Muthén et al., 2017).

For each outcome, that is, violent ideations at age 17 and at age 20, variables were entered into a blockwise ML model. The baseline model included the sociodemographic variables and the variables representing long-term predictors for between-individual variation in violent ideations. In the full model, we added the indicators of polyvictimization and adverse life experiences during the past year. Likelihood ratio tests were conducted to assess whether the full model fit the data better than the baseline model.

Additional analyses examined whether the longitudinal association between polyvictimization and violent ideations varied by sex. Polyvictimization scores were centered before the interaction terms were calculated.

Finally, we visualized the results by plotting the marginal means of violent ideations against the polyvictimization score by sex and for each age group across the range from 0 to 10 victimizations. In addition to the means for continuous VIS scores we also show the predicted means for the dichotomized Yes/No violent ideations outcomes, based on logistic regressions. These additional results mainly serve to translate the findings into an accessible metric. In all models, marginal means were computed at the mean values of all other variables of the regression models.

3 | RESULTS

Descriptive statistics and zero-order correlations for the two groups of analyses are presented in Tables 1 and 2.

The majority of bivariate associations was statistically significant and in the expected direction. The pattern of bivariate associations was similar in late adolescence and early adulthood. At both ages violent ideations were strongly correlated with sex, antecedent violent thoughts, aggressive behavior, violent media consumption, moral neutralization of violence, and polyvictimization.

3.1 | Age 17 violent ideations

Table 3 presents the standardized regression coefficients (β), the *t* values, and the significance levels for the Tobit models predicting violent ideations at age 17.

Model 1 first shows the results for the sociodemographic variables, as well as the antecedent behaviors, cognitions, and attitudes assessed at age 15. It suggests that male adolescents are more likely to have violent ideations than females ($\beta = 0.241$; $p < .001$). Parental SES was not significantly associated with the probability of violent ideations. Furthermore, developmental antecedents measured at age 15 prospectively predicted violent ideations. Adolescents were significantly more likely to experience violent ideations at age 17 if, at age 15, they had frequent aggressive thoughts ($\beta = 0.161$; $p < .001$), scored high on aggressive behavior ($\beta = 0.151$; $p < .001$), frequently consumed violent media contents ($\beta = 0.084$; $p = .040$), morally neutralized violent behaviors ($\beta = 0.130$; $p = .001$), and had higher levels of internalizing symptoms ($\beta = 0.161$; $p < .001$).

Model 2 additionally examines the effects of adverse events and victimization experiences during the past 12 months. The likelihood ratio test (LR $\chi^2(3) = 380.8$; $p < .0001$) suggests that adding these experiences in the past year leads to a highly significant improvement of the model fit. The effects of sex, as well as developmental antecedents, are similar to those found in the baseline model, but in the full model, the effect of violent media consumption is no longer significant ($\beta = 0.069$; $p = .088$) and the effect size of internalizing symptoms is substantially reduced from $\beta = 0.161$ to $\beta = 0.101$ ($p = .003$). Adverse life events experienced in the preceding 12 months are not associated with significant increases in violent ideations. In contrast, experiences of polyvictimization were significantly associated with increases in violent ideations ($\beta = 0.230$; $p < .001$).

3.2 | Age 20 violent ideations

Table 4 displays the findings for violent ideations in early adulthood, at age 20.

Model 3 is the baseline model. It shows the estimates for demographic variables and developmental antecedents measured at age 17 only. It shows that males are significantly more likely to experience violent ideations ($\beta = 0.164$; $p < .001$) and that a higher family social class background is associated with more violent ideations ($\beta = 0.068$; $p = .022$). Violent ideations at age 17 are highly predictive of violent ideations at age 20 ($\beta = 0.301$; $p < .001$). Also, violent media consumption ($\beta = 0.109$; $p = .021$), moral neutralization ($\beta = 0.126$; $p = .005$), and internalizing symptoms ($\beta = 0.125$; $p = .002$) predict violent ideations 3 years later.

Model 4 presents the results with the additional measures for adverse experiences in the past 12 months. The likelihood ratio test (LR $\chi^2(3) = 307.6$; $p < .0001$) shows that the full model results in a significantly better fit of the data. The results show that levels of violent ideations at age 20 are predicted by being male as well as, at age 17, having violent ideations, morally neutralizing the use of violence against others, and having internalizing symptoms. In

TABLE 1 Descriptive statistics and bivariate associations, variables included in the analyses for violent ideations at age 17

	M	*SD*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Violent ideations, age 17	1.34	0.53	–								
2. Sex (m = 1)	0.51	0.50	**0.254**	–							
3. Parental SES	45.6	19.3	−0.041	0.038	–						
4. Aggressive thoughts, age 15	0.00	0.66	**0.366**	**0.111**	**−0.087**	–					
5. Aggressive behavior, age 15	1.66	0.48	**0.397**	**0.198**	**−0.095**	**0.539**	–				
6. Violent media, age 15	2.18	1.04	**0.347**	**0.512**	**−0.193**	**0.359**	**0.463**	–			
7. Moral neutralization, age 15	2.09	0.53	**0.377**	**0.347**	**−0.145**	**0.443**	**0.618**	**0.505**	–		
8. Internal symptoms, age 15	2.33	0.78	**0.096**	**−0.397**	0.041	**0.223**	**0.142**	**−0.195**	−0.004	–	
9. Adverse life events, age 17	1.21	1.19	**0.162**	−0.006	−0.006	**0.203**	**0.160**	**0.132**	**0.134**	**0.151**	–
10. Polyvictimization, age 17	2.95	2.07	**0.319**	−0.020	0.007	**0.233**	**0.252**	**0.104**	**0.168**	**0.277**	**0.230**

Note: Significant correlations at the $p < .05$ level are in boldface.

Abbreviation: SES, socio-economic status.

TABLE 2 Descriptive statistics and bivariate associations, variables included in the analyses for violent ideations at age 20

	M	*SD*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Violent ideations, age 20	1.18	0.37	–								
2. Sex	0.51	0.50	**0.245**	–							
3. Parental SES	45.6	19.3	−0.005	0.038	–						
4. Violent ideations, age 17	1.34	0.53	**0.474**	**0.254**	−0.041	–					
5. Aggressive behavior, age 17	1.55	0.42	**0.324**	**0.197**	**−0.109**	**0.599**	–				
6. Violent media, age 17	2.05	0.85	**0.338**	**0.567**	**−0.115**	**0.394**	**0.369**	–			
7. Moral neutralization, age 17	1.94	0.53	**0.352**	**0.432**	**−0.105**	**0.517**	**0.578**	**0.511**	–		
8. Internalizing, age 17	2.41	0.81	**0.067**	**−0.403**	0.025	**0.153**	**0.130**	**−0.159**	**−0.068**	–	
9. Adverse life events, age 20	1.29	1.21	**0.172**	0.041	−0.048	**0.186**	**0.149**	**0.179**	**0.168**	**0.125**	–
10. Polyvictimization, age 20	1.82	1.85	**0.254**	−0.032	0.025	**0.230**	**0.235**	**0.096**	**0.152**	**0.229**	**0.228**

Note: Significant correlations at the $p < .05$ level are in boldface.
Abbreviation: SES, socio-economic status.

contrast, neither aggressive behavior at age 17 nor consumption of violent media were predictive of violent ideations. The number of different victimization experiences in the past 12 months was significantly associated with more violent ideations ($\beta = 0.190$; $p < .001$). Similarly, the variety of other adverse life events was associated with a higher level of violent ideations ($\beta = 0.063$; $p = .024$).

3.3 | Further analyses

In additional analyses, we examined whether the association between polyvictimization and violent ideations was moderated by sex. Results suggest that in late adolescence, there was a tendency toward a steeper slope for males, but the interaction effect was not

TABLE 3 Blockwise full-information maximum likelihood Tobit regression of violent ideations at age 17 on developmental antecedents and past year victimization

	Model 1		Model 2	
Predictors	*β*	*t* (sig.)	*β*	*t* (sig.)
Demographics				
Sex (1 = male)	0.241	7.332 ($p < .001$)	0.238	7.603 ($p < .001$)
Parent SES	0.043	1.661 ($p = .097$)	0.036	1.432 ($p = .155$)
Age 15 antecedents				
Aggressive thoughts	0.161	4.895 ($p < .001$)	0.143	4.399 ($p < .001$)
Aggressive behavior	0.151	3.771 ($p < .001$)	0.122	3.198 ($p = .001$)
Violent media usage	0.084	2.058 ($p = .040$)	0.069	1.794 ($p = .073$)
Moral neutralization	0.130	3.250 ($p = .001$)	0.121	3.163 ($p = .002$)
Internalizing symptoms	0.161	4.855 ($p < .001$)	0.101	2.926 ($p = .003$)
Age 17 adverse experiences				
Adverse life events, 12 months	–	–	0.020	0.712 ($p = .477$)
Polyvictimization 12 months	–	–	0.230	7.691 ($p < .001$)
% left censured	40.0		40.0	
Pseudo R^2	30.4%		35.2%	
LL	−21860.6		−21670.2	
N	1464		1464	

Abbreviation: SES, socio-economic status.

TABLE 4 Blockwise full-information maximum likelihood Tobit regression of violent ideations at age 20 on developmental antecedents and past year victimization

	Model 3		Model 4	
Predictors	***β***	***t* (sig.)**	***β***	***t* (sig.)**
Demographics				
Sex (1 = male)	0.164	3.893 ($p < .001$)	0.181	4.449 ($p < .001$)
Parent SES	0.068	2.288 ($p = .022$)	0.058	2.007 ($p = .045$)
Age 17 antecedents				
Violent ideations	0.301	7.539 ($p < .001$)	0.278	7.148 ($p < .001$)
Aggressive behavior	0.023	0.461 ($p = .645$)	0.000	−0.001 ($p = .984$)
Violent media consumption	0.109	2.303 ($p = .021$)	0.084	1.816 ($p = .069$)
Moral neutralization	0.126	2.807 ($p = .005$)	0.114	2.607 ($p = .009$)
Internalizing symptoms	0.125	3.058 (p = .002)	0.084	2.158 ($p = .031$)
Age 20 adverse experiences				
Adverse life events, 12 months	–	–	0.063	2.255 ($p = .024$)
Polyvictimization 12 months	–	–	0.190	6.519 ($p < .001$)
% left censured	59.8		59.8	
Pseudo R^2	30.8%		34.9%	
LL	−23067.2		−22913.4	
N	1368		1368	

Abbreviation: SES, socio-economic status.

significant ($b = 0.071$; $p = .246$). Among young adults, there was no interaction between sex and victimization in predicting violent ideations ($\beta = 0.004$; $p = .927$).

Figures 1 and 2 show marginal means of the continuous and dichotomized violent ideations measures estimated at between 0 and 10 victimization experiences.

Figure 1 shows that among adolescent males with no victimization experience, the predicted probability of at least one violent ideation in the past month is around 56%, rising to 97% among those who have experienced 10 different types of victimization. Among young adult females, the predicted proportion that experiences at least one violent ideation rises from 23% to 73%. Figure 2 shows the predicted mean scores on the VIS scale. They suggest that slopes of the association between violent ideations and polyvictimization are generally similar in late adolescence and early adulthood, and among males and females. However, mirroring the nonsignificant interaction effect described above, they are suggestive of a somewhat steeper slope among male adolescents.

In supplementary analyses (Supporting Information Materials), we further examined a core assumption of Tobit models, namely that the same process affects the censoring (i.e., whether the dependent variable is zero or not) and the variation across the continuous observed values. We found general support for the tenability of Tobit models in that the logit part and the OLS part of the model were generally in the same direction and had comparable significant levels. We finally formally tested whether regression coefficients for the predictors of violent ideations at ages 17 and 20 differed. Results suggested that none of the effects was significantly different between the two age groups for operationally identical predictors.

4 | DISCUSSION

The present study primarily aimed to examine whether victims of interpersonal, intentional harm-doing are more likely to have violent ideations, whether multiple victimizations of different kinds—that is polyvictimization—incrementally increased violent ideations, and whether effects varied between late adolescence and early adulthood, and between males and females.

The results demonstrate that exposure to multiple forms of victimization across different domains is closely associated with the frequency of ideations about killing, attacking, or humiliating another person, controlling for a range of prospective risk factors that capture between-individual variation in the propensity to experience violent ideations. The findings add to the evidence on the effects of victimization on a range of negative other-related emotional and cognitive processes such as anger and the attribution of hostile intent (Charak et al., 2016; Finkelhor et al., 2007; Kochenderfer-Ladd, 2004) as well as less moral censure on own violent behavior

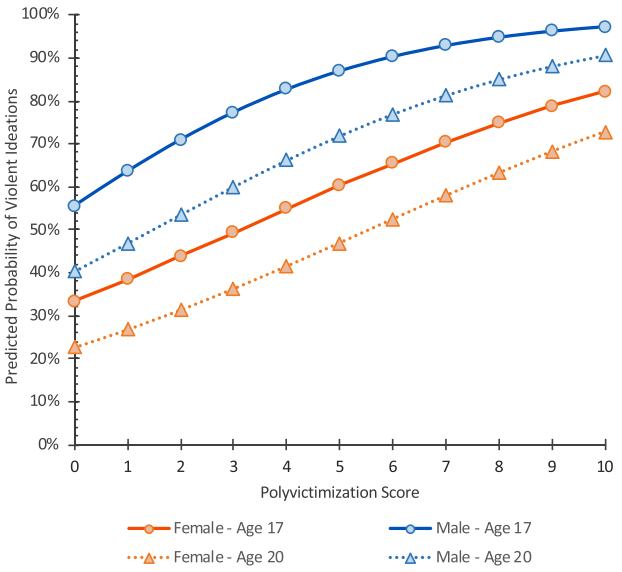

FIGURE 1 Predicted probability of violent ideations as a function of polyvictimization, marginal means, logit model. Note that marginal means estimated at age 17: SES = 46.49, violent thoughts = 0.01, violent media consumption = 2.12, aggressive behavior = 1.65; internalizing = 2.37; moral neutralization = 2.07; negative life events = 1.19. SES, socio-economic status [Color figure can be viewed at wileyonlinelibrary.com]

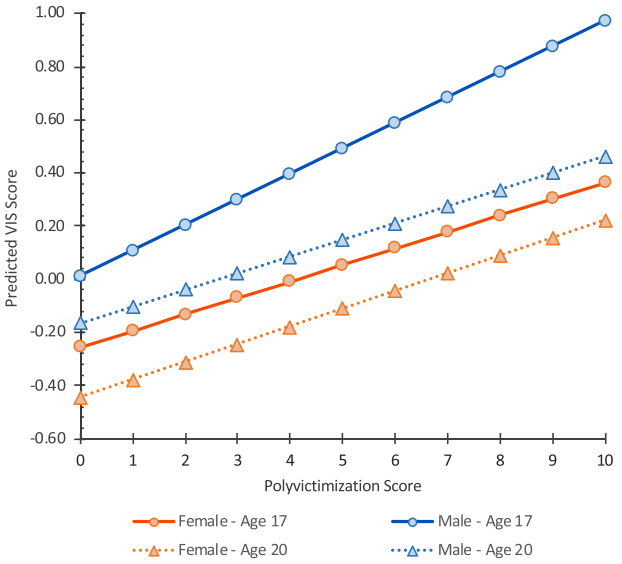

FIGURE 2 Predicted violent ideations score as a function of polyvictimization, marginal means, Tobit Model. Note that marginal means estimated at age 17: SES = 46.49, violent thoughts = 0.01, violent media consumption = 2.12, aggressive behavior = 1.65; internalizing = 2.37; moral neutralization = 2.07; negative life events = 1.19. SES, socio-economic status; VIS, Violent Ideations Scale [Color figure can be viewed at wileyonlinelibrary.com]

(Averdijk et al., 2016). They may be indicative of an evolved motivational complex that is triggered by the experience of intentional threats to one's own well-being and that has responses associated with revenge and retaliation at its core (J. C. Jackson et al., 2019). They are also consistent with the notion that intentional threats to one's well-being trigger angry emotions, which, in turn, make aggression-related cognitive scripts more accessible (Gilbert et al., 2013).

In contrast to victimization experiences, adverse life events generally did not increase the likelihood of violent ideations among adolescents over and above the effects of other predictors in the model, and had a small effect among young adults. These findings are consistent with the notion that ideations of attacking and killing others tend to be triggered specifically by experiences of interpersonal harm-doing rather than by noxious stimuli more generally (Gäbler & Maercker, 2011; McCullough et al., 2013). In line with this view, Elshout et al. (2015) found that vengeful cognitions differ from angry cognitions by their interpersonal focus, that is, the sense of having been personally slighted, insulted, humiliated, and attacked in one's identity.

We did not find evidence in support of sex differences in the association between victimization experiences and violent ideations. This finding is not consistent with research that suggests stronger effects of victimization on other-directed cognitions and behaviors including aggression, delinquency, and anger as well as retaliatory and vengeful cognitions in males rather than in females (du Pont et al., 2018; Duke et al., 2010; Peled & Moretti, 2010). Possibly, further distinctions between different types of victimization (e.g., status-threatening victimizations in public, property crimes, etc.) and subtypes of violent ideations (e.g., ideations about physical, relational, sexual violence) would reveal further insight.

Also, we did not find strong support for the hypothesis that the effects of polyvictimization on violent ideations were attenuated from adolescence to early adulthood, reflecting neurosocial maturation processes (e.g., Shulman et al., 2015). However, the nonsignificant additional effect of victimization on adolescent males (Figure 1), which disappears in young adulthood, may be interpreted as a tendency toward a greater threat-sensitivity among male adolescents in particular. Further research is needed to compare dynamics across a broader age range.

While the focus of this study was on the effects of victimization on violent ideations, it also added to insights into other mechanisms implied in the developmental dynamics of violent ideations. In particular, we found that violent ideations in late adolescence and early adulthood are mainly predicted by antecedent levels of aggressive thoughts, internalizing symptoms, and moral neutralization of violence. The finding that violent ideations are predicted by antecedent aggressive thoughts and aggressive behavior is consistent with the idea that violent ideations may be a facet of trait aggressiveness (P. F. Tremblay & Dozois, 2009). Our finding that internalizing symptoms at an earlier age uniquely predict violent ideations both in late adolescence and early adulthood is consistent with previous research that finds that anxiety and depression are associated with an increased tendency to experience ruminative thought processes generally (Nolen-Hoeksema, 2000), and anger ruminations in particular (Dutton & Karakanta, 2013).

The association between the consumption of violent media contents and subsequent violent ideations is in line with extensive research on the effects of violent video media on cognitions related to aggressive behavior (Anderson & Bushman, 2001). We note, however, that in the present study, the effects of media consumption were small, both at ages 17 and 20, in comparison to other predictors.

Furthermore, we find that cognitive styles that help to morally disengage from violent behavior (i.e., moral neutralization of violence) are predictive of violent ideations. This link is consistent with research on moral disengagement as a regulatory mechanism that lowers emotional discomfort associated with harming behavior, and that facilitates access to violent thoughts and behavior models (Caprara et al., 2014; Tillman et al., 2018).

5 | LIMITATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

The present study has several strengths. They include the longitudinal design, the measurement of violent ideations through a psychometrically validated instrument, the inclusion of a broad range of relevant developmental covariates, comprising prior violent thoughts/ideations, a large community sample of adolescents, and a low attrition rate. However, several limitations should be noted.

First, the generalizability is limited. The sample was drawn from young people in the city of Zurich, Switzerland, a highly affluent society with relatively low levels of violence compared with other national contexts. It may be that the effects of victimization on violent ideations vary between societies or for different age groups. For example, sex differences in violent ideations as a response to victimization may be stronger in patriarchal honor cultures than in more individualistic societies (Cohen et al., 1996). Comparative studies on the strength of the link between victimization and violent fantasies in different cultures could help to shed light on this issue. Similarly, the link between victimization experiences and subsequent fantasies of harming and killing others may be specific to the organization of cognitive processes during late adolescence and early adulthood (Blakemore & Choudhury, 2006). Therefore, it would be important to examine similar processes for a broader range of age groups and cultures.

A second limitation is the lack of measures that track the proximal neurocognitive processes that may mediate the link between victimization experiences and violent ideations. For example, future research might assess the extent to which perceptions of personal humiliation linked to a particular victimization experience affect the likelihood of subsequent violent ideations (e.g., Elison & Harter, 2007). Also, embedding experimental components into observational longitudinal studies could pave the way for a better understanding of the neurocognitive bases of the effects of victimization on other-directed and self-directed cognitions. For example, functional magnetic resonance imaging studies that compare the activation of neural processes in response to experimentally induced (mild) provocations or threatening situations among victims and non-victims could help to understand the neural pathways that underlie the link between victimization and self-reported violent ideation. Also, the effects of victimization on neurocognitive processes may be moderated by genetic characteristics, for example, polymorphisms on the MAOA gene (Barnes et al., 2014). Finally, experience-sampling studies with repeated measures taken at short time intervals in natural environments could help to better understand the short-term cognitive dynamics that link victimization experiences and emotional states (Murray et al., 2020).

Future studies could also address a third limitation, namely that the findings reported here are observational, which limits the extent to which causal inferences can be made. Future studies could address this limitation by considering violent ideations as an outcome in preventive interventions aimed to reduce victimization related to child maltreatment, bullying, or dating violence.

The findings reported here have implications for victim support and prevention. In particular, ruminative violent ideations may in themselves contribute to more negative outcomes for victims of violence, including longer and more extensive feelings of embitterment and a higher risk of own externalizing behaviors (Dunn & Hughes, 2001; Guerra et al., 2003; Moeller et al., 2017; Murray et al., 2017; Persson et al., 2018; C. E. Smith et al., 2009). The findings reported here suggest that victims of violence may be screened for violent ideations, and that interventions should address violent ideations as part of broader cognitive-behavioral strategies designed to help victims of violence.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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