Cyberbullying in Context:

Direct and Indirect Effects by Low Self-Control Across 25 European Countries

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**Abstract**

Random samples of at least 1,000 youth, ages 9 to 16 years, from 25 European countries (N = 25,142) were used to test the salience of low self-control on cyberbullying perpetration and victimization (direct and indirect effects), framed by a cross-cultural developmental approach. Path models which provided evidence of invariance by sex, tested the hypothesized links among low self-control as well as known correlates, including offline perpetration and victimization, and externalizing behaviors. Results showed positive associations between online and offline bullying behaviors (perpetration and victimization), and more interestingly, both direct but mostly indirect effects by low self-control on cyberbullying perpetration and victimization; externalizing behaviors had little additional explanatory power. Importantly, multi-group tests by country samples provided evidence of quite modest differences in the tested links across the 25 developmental contexts, despite some observed differences in the amount of variance explained in the dependent measures.

**Keywords:**

Cyberbullying, self-control, deviance, problem behaviors, cross-cultural

**Introduction**

Epidemiological data support the widespread existence of cyberbullying perpetration and victimization, in the US (Kowalski & Limber, 2007), Europe (Vandebosch & Van Cleemput, 2009; see also Kiriakidis & Kavoura, 2010; Tokunaga, 2010), and Australia (Spears, Slee, Owens, & Johnson 2009). For instance, the incident of cyberbullying victimization among 9 to 16 year olds is 8% (5% on the internet and 3% by mobile calls, texts or video; range: 2% to 14% across European countries); on the other hand, cyberbullying perpetration rates are lower, namely 3% have bullied others on the internet, while 2% by mobile calls, texts or video (Livingstone, Haddon, Görzig, & Ólafsson, 2011). Data from the United States further substantiate the problem; 8% of youth between the ages of 10 and 15 years report having been harassed on the internet monthly or more often (Ybarra, Diener-West, & Lief, 2007). Thus, cyberbullying, defined as an intentional and repetitive aggressive behavior perpetrated through electronic devices (Smith et al., 2008), has become a public health concern.

However, few studies have tested the etiology or consequences of these behaviors (David-Ferdon & Hertz, 2007), particularly across different cultural developmental contexts (cf., Florell, Ang, & Schenck, 2010). Strom and Strom (2005) liken particularly cyberbullying perpetration to other unlawful behaviors, with the explicit goal of threatening or harming others. Therefore, cyberbullying perpetration resembles deviance or deviant conduct – conduct that might be readily explained by precursors of deviance, for instance. Only a handful of studies has linked low self-control to bullying (e.g., Unnever & Cornell, 2003) and victimization (Haynie et al., 2001), despite the fact that low self-control has been identified as the single most important predictor of deviance and crime in countless empirical studies since self-control theory was published (Gottfredson & Hirschi, 1990; see also Baumeister & Vohs, 2004 for related conceptual work).  Previous work has also shown that cyberbullying is highly associated with traditional bullying (Juvonen & Gross, 2008; Raskauskas & Stoltz, 2007), and

thus potentially, a parallel manifestation of aggression, of deviance, and of low self-control. Finally, self-control should be construed as a manifestation of self-regulation capacity, known to be linked to externalizing behaviors (e.g., Murray & Kochanska, 2002), a potential concomitant of both traditional and cyberbullying (Hay, Meldrum, & Mann, 2010).

The consequences of being victimized are certainly negative even in the sense that cyberbullying aggravates a victim´s maladjusted behaviors (Mitchell, Ybarra, & Finkelhor, 2007). In fact, victims of cyberbullying report significantly higher levels of depressive symptoms than victims of traditional bullying, even when controlling for their involvement in traditional bullying/victimization (Perren, Dooley, Shaw, & Cross, 2010). Furthermore, youth who report either traditional or cyberbullying were more likely to report suicidal ideation and to attempt suicide (Hinduja & Patchin, 2010).

In the current study, we were interested in developing a greater understanding of how low self-control impacts cyberbullying victimization and perpetration among male and female youth, with a consideration of both externalizing behaviors as well as traditional bullying perpetration and victimization. Some of these links were exploratory in nature, such as the one between low self-control and cyber victimization, for instance. Despite some observed differences in rates of cyberbullying by sex, theoretically, the same causal model applies to both male and female youth; thus, in addition to testing it across developmental contexts, we were also interested in examining its tenability by sex.

*The Salience of Low Self-Control*

Self-control theory (Gottfredson & Hirschi, 1990) identifies key developmental precursors that differentiate between individuals, both males and females, who develop adequate levels of self-control and thus are more likely to conform to social norms, mores, and prescribed behaviors versus ones who do not. Parents and caregivers instill conformity, during the first decade of life, instill self-control by maintaining an affectively close bond to

their children, by monitoring their behaviors, and by correcting norm violations. These efforts are then also followed up by ones at school in that teachers further build these bonds to society or potentially attempt to correct inadequate early efforts to establish them. The empirical evidence has largely supported this (e.g., Vazsonyi & Huang, 2010).

Individuals low in self-control seek immediate pleasure without much consideration of long-term consequences of their behaviors or actions. Duckworth and Kern (2011) recently conducted a meta-analysis of work testing the operationalization and measurement of self-control and found strong support for the construct. However, they also lament that "several authors have noted the challenge of defining and measuring self-control (also referred to as self-regulation, self-discipline, willpower, effortful control, ego strength, and inhibitory control, among other terms) and its converse, impulsivity or impulsiveness" (p. 2). They also find that researchers across disciplines, such as developmental or personality psychology, generally do not cite or inform each other's efforts. They conclude with a common operational definition that encapsulates developmental efforts on self regulation of young children as well as work on assessing impulsivity, namely that "self-control is the idea of voluntary self governance in the service of personally valued goals and standards" (p. 3). In this sense, low self-control is part and parcel of missing self regulation capacity among children, of poor executive functioning, of poor attentional processes, of sensation seeking or of impulsivity.

We hypothesized that both for male and female adolescents, individuals relatively lower in self-control would be more likely to engage in cyberbullying perpetration as compared to their peers. Taking into account self-control as a predictor of victimization (Haynie et al., 2001) and the significant and substantial overlap of conventional bullying and cyberbullying (offline victimization predicts online victimization; Raskauskas & Stoltz, 2007), we also hypothesized both direct as well as indirect effects on cyberbullying

victimization by self-control (via externalizing behaviors, offline perpetration and victimization), again for both male and female youth. Additionally, testing the links between low self-control and cyber-perpetration/victimization might be particularly relevant when considering features of the internet. It is known that online anonymity supports disinhibited conduct (Suler, 2004); in fact, this provides an important opportunity (Gottfredson & Hirschi, 1990) to engage in aggression directed towards others, something simply less likely in the "real world."

*Correlates and Predictors of Cyberbullying Perpetration and Victimization*

Prior research has shown that traditional school bullying predicts cyberbullying. Juvonen and Gross (2008) found that school bullying experiences increased the likelihood of cyberbullying, independent the type of electronic of media used. However, this link is not straightforward. Some research has found that due to online anonymity, youth who are targets of peer aggression at school might in fact seek to retaliate on the internet (Heirman & Walrave, 2008). Research substantiates this and has shown that cyber perpetrators are in fact frequently identified as victims of traditional bullying (Kowalski, Limber, & Agatston, 2008; Li, 2007), or that traditional bully-victims tend to bully others online (Smith et al., 2008).

On the other hand, and more salient perhaps, is the evidence which shows that traditional bullying or perpetration predicts the same roles in cyberbullying. Offline peer victimization is also related to cyber victimization (Hinduja & Patchin, 2008; Raskauskas & Stoltz, 2007; Smith et al., 2008). Furthermore, studies have shown how victimization and perpetration are inextricably linked; a large proportion of those who are cyber victims are also cyber aggressors (Hinduja & Patchin, 2007; Sevcikova & Smahel, 2009; Vandebosch & Van Cleemput, 2009; Ybarra & Mitchell, 2004; Ybarra, Mitchell, Wolak, & Finkelhor, 2006). Thus, in our hypothesized model, we tested the relationships not only between traditional perpetration and cyber perpetration and between traditional victimization and cyber

victimization, but also the paths from traditional bullying to cyber victimization and from traditional victimization to cyber perpetration. Quasi antecedent to these relationships, we hypothesized that low self-control would predict both traditional bullying perpetration and victimization, and through them, the two cyberbullying measures.

A number of studies have documented the relationships between aggression and cyberbullying (Ang, Tan, & Mansor, 2010; Aricak et al., 2008; Calvete, Orue, Estévez, Villardón, & Padilla, 2010; Dilmaç, 2009) or other measures of problem behaviors, as well as between delinquency and cyberbullying (Hinduja & Patchin, 2007, 2008). Thus, we were interested in understanding to what extent self-control explained variability in cyberbullying victimization and perpetration, net any effects by known correlates, including externalizing behaviors (i.e., drinking or delinquency; Stoff, Breiling, & Maser, 1997; Liu, 2004). We expected that youth growing up during the digital age might spend unsupervised time online placing them at greater risk for cyberbullying, both victimization (Smith et al., 2008) and perpetration (Aricak et al., 2008; Li, 2007). In addition, previous research has shown that externalizing behaviors predict peer victimization (e.g., Hodges, Boivin, Vitaro, & Bukowski, 1999). Thus, the hypothesized model included paths from externalizing behaviors to both cyberbullying perpetration and victimization, but also direct ones from low self-control.

## Plan of Analysis

Model tests were conducted as path analyses with observed variables in AMOS 18 (Arbuckle, 2009) which permitted us to specify these hypothesized links. In addition, this analytic approach permitted a test to what extent the observed relationships varied by sex and also whether they replicated across the 25 different European developmental contexts. Customary model fit evaluative criteria provided by AMOS as well as difference statistics were used for this purpose ($\chi^2$, CFI, NFI, RMSEA). Observed differences in rates of cyberbullying by country might lead to the erroneous conclusion that the underlying etiology

is unique among males and females or in each developmental context. It is conceivable that despite observed differences in the frequency of these behaviors by sex or across contexts, the underlying etiology or patterns of associations among known correlates and predictors is largely the same. By applying a rigorous multi-group test, we were able to directly address these questions[1].

## Methods

*Sample and Procedures*

The present study used data part of the EU Kids Online II study which randomly sampled 1,000 youth in each of 25 European countries. This study was conducted in April/October 2010 across these countries and included 25,142 youth (50% girls). It focused on youth between the ages of 9 and 16 years of age. Data were collected through surveys at the homes of participants, after initial pilot tests to ensure understanding. Ipsos MORI provided support for designing the questionnaire and contracted with local fieldwork agencies to ensure that a standard approach was used across countries. In each household, a youth and one of his/her parents were asked about child´s online experiences. An informed consent process from both parents and youth was used, and participants were assured of both confidentiality. The study was approved by the LSE (London School of Economics and Political Science) Ethics Committee. Additional details about the study methodology, including human subjects issues, can be consulted online (Linvingstone et al., 2011).

*Measures*

We present descriptive statistics of the main scales and variables in Table 1 by sex, including reliability estimates.

*Age*. Parents were asked question "What is the age of your child?" and answered about their age in years; parents also had the option of answering "I don´t know."

*Sex*. The child's sex was coded by the interviewer.

*Offline and Cyberbullying Victimization* were introduced to participants by first describing these behaviors very concretely at the beginning of relevant survey sections ("Sometimes children or teenagers say or do hurtful or nasty things to someone and this can often be quite a few times on different days over a period of time, for example.") Additional examples were provided to cue youth into the behaviors being assessed. Next, a filter question was provided, namely "Has someone acted in this kind of hurtful or nasty way to you in the PAST 12 MONTHS?"  Next, a question assessed the location of the experience, coded as "In person face to face" (offline victimization) or "on the Internet" or "by mobile phone calls, texts or image/video texts" (both coded as online or cyberbullying victimization). Finally, a frequency question ascertained how often this happened, on 4-point Likert-type scale ranging from "less often" (1) to "every day or almost every day" (4). A higher score indicated more frequent victimization experiences.

The final offline and cyberbullying victimization scores were computed by forming a product term between the frequency question and the "location" questions just described, which resulted in a 5-point distribution of scores of offline victimization and cyberbullying victimization, with a preponderance of 0's. To address this high positive skew (3.6 and 5.3, respectively) and to normalize the data, we attempted a series of transformation (log, square root, and reflected inverse); an arbitrary whole number was added to each score (+1) to permit the application of these transformations. The inverse improved scores the most (2.4 and 3.8, respectively), but skew remained an issue. However, previous comparative work based on large samples has shown that regression-based techniques as applied in SEM largely provide robust parameter estimates, despite violations of normality (Vazsonyi, Pickering, Junger & Hessing, 2001). This was largely confirmed and a decision was made to retain the original scores for path analyses. The same process was followed for both perpetration scores as well as externalizing behaviors.

*Offline and Cyberbullying Perpetration* was identified by the following question "Have you acted in a way that might have felt hurtful or nasty to someone else in the PAST 12 MONTHS?" Next, a location question identified where the experience took place (as described for the victimization variables), followed by a frequency rating ranging from "less often" (1) to "every day or almost every day" (4). Higher scores indicated more frequent perpetration experiences.

*Low self-control.* Low self-control was measured by three items for the purpose of the current study, namely "I get very angry and often lose my temper", "I do dangerous things for fun", "I do exciting things, even if they are dangerous". Statements were answered on the scale 1="not true", 2="a bit true", and 3="very true". A scale score was computed by averaging the three items, where a high score indicated low self-control.

*Externalizing behaviors.* These behaviors were assessed by asking participants about engaging in a variety of problem or antisocial behaviors during the past 12 months; the scale was adapted from the Health Behaviour in School-aged Children Survey (Currie et al., 2008) and newly developed for the current study.  The five items used included questions about drinking, problems with school attendance, having sexual intercourse, problematic behavior at school, and trouble with police. Respondents rated the items as 0 = No and 1=Yes. Items were averaged and a high score indicated higher levels of externalizing behaviors.

**Results**

*Cyberbullying Rates Across Europe*

The rates of cyberbullying perpetration and victimization were not the goal of this article, and we do not report them because of space constraints. However, rates across European countries (based on the same data) are described in the report of EU Kids Online II project and are available online.

*Correlations of Main Constructs*

Table 2 includes the associations between the main study constructs by sex. In general, the observed associations were consistent with expectations; low self-control was positively associated with externalizing behavior, but also with both offline and cyberbullying perpetration and victimization. Furthermore, externalizing behaviors were positively associated with each of the perpetration and victimization measures. Finally, the largest associations were found between offline perpetration and cyberbullying perpetration and between offline victimization and cyberbullying victimization. Importantly, few differences in the general patterns of associations were found when comparing male and female youth, although some differences in magnitude of the links were observed. Because of these differences, we were interested in testing the specified path model by sex using a multi-group analysis in AMOS.

*Path Analysis*

In Table 3, we provide the results from multi-group tests by sex (see Figure 1), to examine the extent to which the specified model and links were similar or different for male versus female youth. To do so, we compared an unconstrained to a constrained model, but also conducted path by path comparisons to be conservative. Overwhelmingly, the data provided evidence of few differences in the links between constructs for males versus females. This was true of both the $\chi^2$ difference tests (not significant in 6 of 11 paths), but certainly also of alternative fit indices (Bentler, 1990; Bentler & Bonett, 1980;  Browne & Cudeck, 1983; Cheung & Rensvold, 2002; Meade, Johnson, & Braddy, 2006) which provided evidence of few or no differences between unconstrained and constrained models. It is important to note that $\chi^2$difference tests are considered weak or even inappropriate tests as they are overly sensitive to sample size (Meade et al., 2006); this was certainly the case here with over 10,000 youth in each group. Based on these findings, the remaining analyses were conducted on the total sample.

Table 4 includes the findings from testing the model on the total sample. We only highlight the most salient findings. First, all hypothesized links were significant and in the expected direction. Second, the model explained 15.5% of the total variance in cyberbullying victimization and 13.4% in cyberbullying perpetration. Next, the direct effects by low self-control on cyberbullying victimization and perpetration were significant, yet modest ($\beta$ = .04 and .05). However, more substantial overall indirect effects by low self-control on cyberbullying victimization and perpetration (i.e. via externalizing behaviors, offline perpetration/ victimization) were found ($\beta$ =.09 and .11). Fourth, model fit, generally not an important consideration in path models with only observed variables, was quite good: $\chi^2(2)$ =395.098; CFI and NFI = .976; RMSEA = .088. Finally, consistent with expectations, offline and cyberbullying behaviors (victimization to victimization, perpetration to perpetration) were strongly associated ($\beta$ =.36 and .32, respectively), although only sharing 10% to 13% of the variance.

*Multi-Group Model Test.* In a final step, we were interested in understanding to what extent the hypothesized relationships varied by study country. For this purpose, a series of multi-group model tests were conducted. Again, an unconstrained model was compared to a fully constrained model, with follow-up path by path tests (paths b1 to b11; Figure 1). Findings from these model tests are shown in Table 5. The fully constrained model significantly differed from the unconstrained model, based both on the significance test as well as alternative fit indices (CFI, NFI, RMSEA). However, follow-up tests path by path (b1 to b11), although again significantly different based on the $\chi^2$ difference test, provided evidence of modest differences across country samples, based on inspection of changes in alternative fit indices. These differences were very small in magnitude ($\Delta$CFI, $\Delta$NFI, $\Delta$RMSEA), thus permitting a general conclusion that when considering each of the eleven individuals paths tested, results provide support for similarities in the hypothesized paths

across the 25 samples (Cheung & Rensvold, 2002; Meade et al., 2006). It is important to note that some paths did seem less similar (or more different) than others across the samples, particularly paths b2 and b4, namely the links between offline and cyberbullying behaviors. Also, when evaluating indirect effects by low self-control on the two dependent measures, differences were found in magnitude across countries (range: .017 [Denmark] to .168 [France] and .044 [Netherlands] to .149 [Cyprus] for perpetration and victimization respectively). Similarly, the amount of variance explained varied across developmental contexts (14.3% and 16.5% for perpetration and victimization respectively; additional details available upon request).[2]

## Discussion

Cyberbullying has become a widespread problem with the arrival of new media and the readily available access to the internet. National figures across the 25 European study countries suggest that a substantial proportion of school-age youth are both engaged in perpetrating bullying online or over the phone, and even a larger number of school-age children report having been affected by these behaviors. Despite a growing body of studies in this area, as is often the case, our knowledge base and how to address this issue seems to lag behind. To gain a better understanding of how to address these behaviors, the initial step must include knowledge building related to the etiology of cyberbullying behaviors.

This is precisely how this study sought to advance our understanding of these behaviors. Our unique focus on the importance of low self-control is related to the insight that bullying behaviors, regardless of modus or locale, are forms of norm violations or deviant acts committed against other individuals. In this sense, these behaviors are potential parallels to violence perpetration and victimization, for instance. One of most consistent constructs identified theoretically and confirmed empirically over the past two decades is low self-control, based on both self-control theory (Gottfredson & Hirschi, 1990), but also based on

psychological work (Baumeister & Vohs, 2004; Duckworth, 2011). Recent work continues to bring attention to the importance of low self-control not only for norm violations, but for a variety of adjustment indicators over the lifecourse (e.g., Moffitt et al., 2011). This also includes seminal work by Duckworth and Kern (2011) which solidifies self-control as a construct, despite different nomenclature used across a number of social scientific disciplines. Our study adds to this existing literature on the importance of self-control by establishing its links with cyberbullying perpetration and victimization.

The evidence points out the salience of indirect effects by low self-control on cyberbullying. For cyberbullying perpetration, low self-control has a moderate effect on offline bullying perpetration which is linked to cyberbullying perpetration. Not surprisingly, we found that the effect by low self-control is smaller for victimization measures.

Extant data indicate inconsistencies in rates of cyberbullying among male and female youth across Europe, although victimization rates are higher among females (Kowalski & Limber, 2007); this is so despite the fact that female adolescents are known to have higher levels of self-control (Delisi et al., 2010). This might provide some support for the hypothesis that opportunity plays an important role in our understanding these behaviors (Gottfredson & Hirschi, 1990). With the current level of penetration by mobile phones and the internet, opportunities for cyberbullying are ever-present for both males and females; thus, we might expect to find few differences in the use of these media. This is further consistent with our findings that the effect by self-control on cyberbullying perpetration is mostly indirect, and it is possible that the disinhibition effect (Heirman & Walrave, 2008; Suler, 2004) simply plays a more important role among female perpetrators. Future work will need to further address this question.

Also, although we find higher victimization rates among female youth, the cyberbullying perpetration rates among male and female youth across Europe are not

consistent (Livingstone et al., 2011). Importantly, we did not find significant differences between male and female youth in the links between low self-control and both cyberbullying perpetration and victimization. Again, this might point to the salience of opportunity.

Cyberbullying does not seem to be a behavior problem that is independent from traditional bullying in that offline vicitms are also at risk to be the victims online; in addition, offline perpetrators seem to be at greater risk to be perpetrators online (Hinduja & Patchin, 2008; Juvonen & Gross, 2008; Raskauskas & Stoltz, 2007; Smith et al., 2008). As low self-control clearly impacts cyberbullying, and because, this effect was mostly indirect through correlates, we might conclude that cyberbullying simply seems to be a specific form of traditional bullying, and thus require little unique explanatory effort. But, with regard to our other findings, cyberbullying does seem to have some specific features that make it a unique kind of behavior and experience, worthy of inquiry.

Although our model was generally supported by the data, and invariant across the 25 country samples, it is important to note that the amount of variance explained in the two cyberbullying constructs was quite modest (about 10% to 20% across country samples). Our findings also do not preclude the possibility that there exist country-specific differences regarding socialization processes - and thus, the development of self-control - which, in combination with a consideration of opportunity might partly explain some observed differences. Future research needs to further examine the role by parenting or other socialization mechanisms as well as the importance of potential sex differences in media use.

Study findings need to be considered with its limitations in mind. First, our measurement of cyberbullying was effectively based on a single item approach, thus calling into question the validity of these measures. Secondly, a large number of participants apparently simply did not reply to some of the more sensitive questions related to being victimized or perpetrating bullying, thus necessitating the assumption analytically that they

were neither perpetrators nor victims of cyberbullying. Future work should employ greater breadth in assessment as well as mechanisms by which participants are required to provide information about whether they have engaged in cyberbullying perpetration or have been victimized. Related to this, future work should also engage in a greater in-depth analysis of potential age effects on the observed relationships. Next, the current study was simply based on cross-sectional data, and thus no causal inferences can be made, despite an inherent directionality part of the specified path model tested. Specifically, a model could also be supported by the data where externalizing behaviors predict cyberbullying, for instance. Finally, given the relatively modest variance we explained, future studies should reconsider more broadly the factors which provide promise to explain cyberbullying and to provide a greater understanding to preconditions for the development and implementation of effective prevention and intervention efforts.

In conclusion, we find the evidence compelling on the invariant patterns of across the 25 European cultures, but also for male versus female youth. Furthermore, the manner in which low self-control indirectly explains variance in cyberbullying victimization and cyberbullying perpetration shows some measure of promise for areas to address and potentially remedy these quasi epidemic behavior problems facing youth today. At the same time, we find equally impressive the unexplained amount of variance, suggesting that much remains to be learned in this area of inquiry.

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<div align="center">Notes</div>

[1]We should note that we tested potential age effects on the two dependent measures by adding

age as a predictor of them; although it was statistically significant, the size of the effects were

very modest (betas = .05 and .03, respectively), and more importantly, the addition of age did

not materially affect the remainder of the model tested (fit or parameter estimates). Thus, for

parsimony, we omitted age in model tests.

[2]In a final exploratory analytic step, we wanted to understand to what extent our findings might be a function of sample nesting effects; in other words, do we find level-2 variability in the dependent measures, and to what extent do model predictors explain some of this variance. Thus, we examined both an unconditional and a conditional multi-level model in SPSS. Two findings require mention. First, there was very little between country variability (ICC), namely 0.5% for cyberbullying perpetration and 1% for cyberbullying victimization. Second, we found both fixed and random effects by low self-control on the two dependent measures, and very importantly, the between country variance became non-significant once low self-control was added into a conditional model, thus indicating that the very modest level 2 variance in cyberbullying measures was fully explained by low self-control.

Table 1

*Descriptive Statistics of Main Study Variables by Sex*

| | # of Items | M | SD | Min/Max | α | N |
|---|---|---|---|---|---|---|
| Cyberbullying victimization | 3 | .10/.13 | .47/.53 | 0/4 | - | 12,641/12,501 |
| Offline victimization | 2 | .24/.22 | .72/70 | 0/4 | - | 12,641/12,501 |
| Cyberbullying perpetration | 3 | .06/.06 | .35/34 | 0/4 | - | 12,641/12,501 |
| Offline perpetration | 2 | .17/.13 | .59/.50 | 0/4 | - | 12,641/12,501 |
| Low Self-Control | 3 | 1.45/1.33 | .48/.41 | 1/3 | .62/.58 | 12,061/12,480 |
| Externalizing behaviors | 5 | .11/.08 | .20/.18 | 0/1 | .63/.62 | 12,050/11,984 |

*Note: Values for male/ female youth.*

Table 2

*Correlations between Main Study Variables by Sex*

|  | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| (1) Cyberbullying victimization |  | .35 | .27 | .17 | .11 | .14 |
| (2) Offline victimization | .41 |  | .14 | .30 | .14 | .11 |
| (3) Cyberbullying perpetration | .27 | .15 |  | .35 | .16 | .18 |
| (4) Offline perpetration | .18 | .30 | .37 |  | .24 | .22 |
| (5) Low self-control | .16 | .15 | .17 | .22 |  | .36 |
| (6) Externalizing behaviors | .13 | .08 | .16 | .16 | .33 |  |

*Note: All correlations are significant at 0.01 level (2-tailed). Values for male youth are above the diagonal and below for female youth.*

Table 3

*Model Tests by Sex*

| Model Tests | $\chi^2$ | df | p | CFI | NFI | RMSEA | $\Delta \chi^2$ | $\Delta$df | p$\Delta \chi^2$ | $\Delta$CFI | $\Delta$NFI | $\Delta$RMSEA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unconstrained model | 392.997 | 4 | .000 | .977 | .976 | .062 | | | | | | |
| All paths constrained | 576.295 | 15 | .000 | .966 | .965 | .039 | 183.298 | 11 | .000 | .011 | .011 | .023 |
| b1 | 398.291 | 5 | .000 | .976 | .976 | .056 | 5.294 | 1 | .021 | .001 | .000 | .006 |
| b2 | 397.292 | 5 | .000 | .976 | .976 | .056 | 4.295 | 1 | .038 | .001 | .000 | .006 |
| b3 | 423.071 | 5 | .000 | .975 | .975 | .058 | 30.074 | 1 | .000 | .002 | .001 | .004 |
| b4 | 393.064 | 5 | .000 | .977 | .976 | .056 | .067 | 1 | .796 | .000 | .000 | .006 |
| b5 | 470.820 | 5 | .000 | .972 | .972 | .061 | 77.823 | 1 | .000 | .005 | .004 | .001 |
| b6 | 417.134 | 5 | .000 | .975 | .975 | .057 | 24.137 | 1 | .000 | .002 | .001 | .005 |
| b7 | 396.403 | 5 | .000 | .976 | .976 | .056 | 3.406 | 1 | .065 | .001 | .000 | .006 |
| b8 | 395.695 | 5 | .000 | .977 | .976 | .056 | 2.698 | 1 | .100 | .000 | .000 | .006 |
| b9 | 393.400 | 5 | .000 | .977 | .976 | .056 | .403 | 1 | .526 | .000 | .000 | .006 |
| b10 | 393.007 | 5 | .000 | .977 | .976 | .056 | .010 | 1 | .921 | .000 | .000 | .006 |
| b11 | 393.011 | 5 | .000 | .977 | .976 | .056 | .014 | 1 | .907 | .000 | .000 | .006 |

*Note.* Three decimals are shown as differences between nested models are meaningful at third decimal. $\Delta$ = values report difference between unconstrained and constrained models.

Table 4

*Path Coefficients for Total Sample*

| Model path | | | b | SE | β | CR | p |
|---|---|---|---|---|---|---|---|
| Low self-control | → | Offline victimization | .232 | .010 | .147 | 23.590 | .000 |
| Low self-control | → | Offline perpetration | .287 | .008 | .235 | 38.257 | .000 |
| Low self-control | → | Externalizing behaviors | .150 | .003 | .349 | 57.834 | .000 |
| Offline perpetration | → | Cyberbullying perpetration | .197 | .004 | .315 | 50.032 | .000 |
| Externalizing behaviors | → | Cyberbullying perpetration | .148 | .011 | .083 | 12.888 | .000 |
| Offline victimization | → | Cyberbullying victimization | .252 | .004 | .358 | 58.691 | .000 |
| Externalizing behaviors | → | Cyberbullying victimization | .190 | .016 | .074 | 11.629 | .000 |
| Offline perpetration | → | Cyberbullying victimization | .032 | .006 | .036 | 5.743 | .000 |
| Low self-control | → | Cyberbullying victimization | .049 | .007 | .044 | 6.877 | .000 |
| Low self-control | → | Cyberbullying perpetration | .041 | .005 | .054 | 8.357 | .000 |
| Offline victimization | → | Cyberbullying perpetration | .018 | .003 | .038 | 6.104 | .000 |

Table 5

*Multi-group Model Tests: Comparisons Across 25 European Countries*

| Model Tests | $\chi^2$ | df | p | CFI | NFI | RMSEA | $\Delta \chi^2$ | $\Delta$df | $p\Delta \chi^2$ | $\Delta$CFI | $\Delta$NFI | $\Delta$RMSEA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Unconstrained model | 643.304 | 50 | .000 | .968 | .966 | .022 | | | | | | |
| Fully constrained model | 2845.641 | 314 | .000 | .864 | .851 | .018 | 2202.337 | 264 | .000 | .104 | .115 | .004 |
| b1 | 714.300 | 74 | .000 | .966 | .963 | .019 | 70.996 | 24 | .000 | .002 | .003 | .003 |
| b2 | 1163.818 | 74 | .000 | .941 | .939 | .024 | 520.515 | 24 | .000 | .027 | .027 | -.002 |
| b3 | 790.727 | 74 | .000 | .961 | .959 | .020 | 147.423 | 24 | .000 | .007 | .007 | .002 |
| b4 | 1181.166 | 74 | .000 | .940 | .938 | .024 | 537.863 | 24 | .000 | .028 | .028 | -.002 |
| b5 | 808.455 | 74 | .000 | .960 | .958 | .020 | 165.151 | 24 | .000 | .008 | .008 | .002 |
| b6 | 824.465 | 74 | .000 | .960 | .957 | .020 | 181.162 | 24 | .000 | .008 | .009 | .002 |
| b7 | 740.233 | 74 | .000 | .964 | .961 | .019 | 96.929 | 24 | .000 | .004 | .005 | .003 |
| b8 | 693.426 | 74 | .000 | .967 | .964 | .018 | 50.122 | 24 | .001 | .001 | .002 | .004 |
| b9 | 807.552 | 74 | .000 | .961 | .958 | .020 | 164.248 | 24 | .000 | .007 | .008 | .002 |
| b10 | 680.252 | 74 | .000 | .967 | .964 | .018 | 36.948 | 24 | .044 | .001 | .004 | .004 |
| b11 | 737.410 | 74 | .000 | .964 | .961 | .019 | 94.106 | 24 | .000 | .004 | .005 | .003 |

*Note. Model fit for unconstrained model, fully constrained model (all paths constrained to equality across countries) and models with individual paths constrained to equality across all countries).* Three decimals shown in this table as differences between nested models meaningful at third decimal. Δ = values reporting difference between unconstrained and constrained models.

Figure 1

*Path Model*
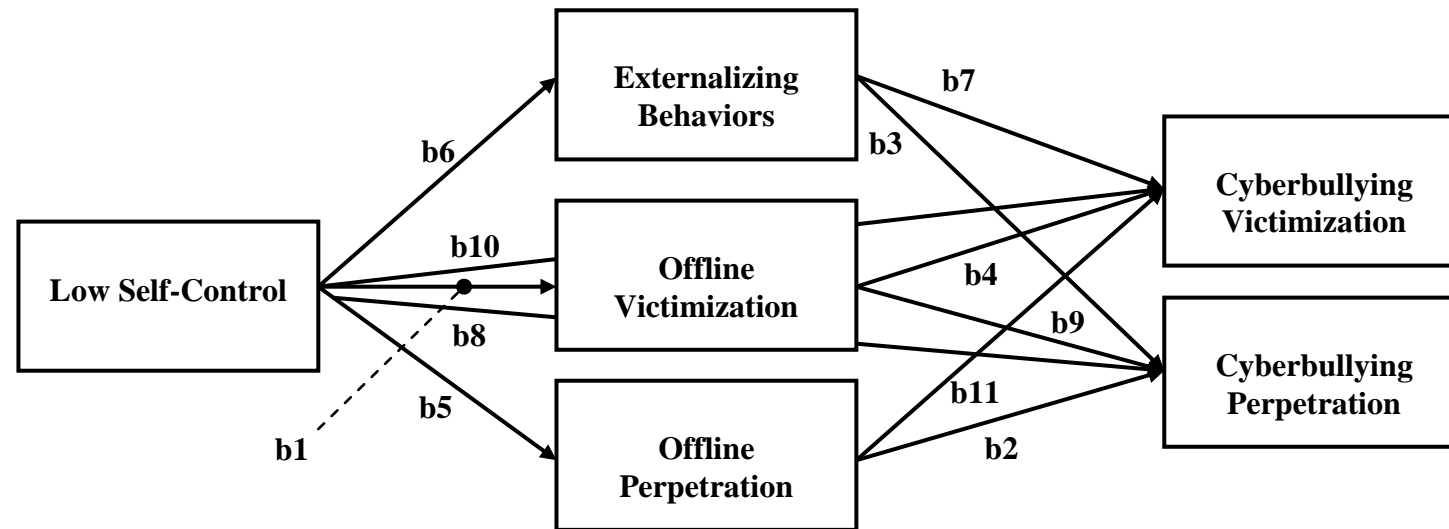


*Notes:* Error terms of the offline bullying constructs and the error terms of the two cyberbullying measures were allowed to correlate and are not shown in the figure. Path labels (b1 – b11) used for the multi-group analysis findings are presented in Table 5; path labels for multi-group test presented in Table 3 are different from Figure 1 and available from first author.