



Associations between online communication with strangers and mild delinquency in junior high school students

Akiko Obokata^{1,2} · Sabina Pauen¹

Accepted: 5 June 2022 / Published online: 20 August 2022
© The Author(s) 2022

Abstract

Today, adolescents can easily make contact with strangers online. The present study examines the relation of online communication with strangers (OCS) and mild delinquency among junior high school students and explores which risk factors are associated with both types of behavior, taking gender differences into account. A total of 1873 Japanese adolescents (aged 12–15) with mobile phones completed online questionnaires assessing internet usage (duration, variability), parental behavior (violence, monitoring), and adolescent characteristics (depression, self-control) as potential predictors of OCS and mild delinquency. Sequential model testing revealed that the duration of internet usage was associated with both dependent variables, whereas its variability was associated with OCS alone. Self-control and parental violence predicted both outcome variables in girls, but only mild delinquency in boys. Depression was related with both behaviors in boys. Parental monitoring was negatively associated with OCS among girls and with mild delinquency among boys. Overall, OCS appeared to have a similar function for girls as mild delinquency did for boys. Implications for future studies and preventive programs will be discussed.

Keywords Mild delinquency · Online communication with strangers · Self-control · Adolescence

Introduction

Adolescence is a time of substantial physical and psychological changes, transforming boys into young men and girls into young women. This physical metamorphosis is not only accompanied by psychological changes at the cognitive, motivational and emotional level, but also by important social developments. Rather than spending most of their time under the supervision of adults, teenagers seek more privacy (Keijsers & Poulin, 2013) and develop a strong need to affiliate with peers (Ragelienė, 2016). They experiment with different roles in various social settings, thereby promoting identity formation (Erikson, 1968). The awakening interest in sexuality strengthens adolescents' motivation to be perceived as sexually attractive (Mares et al., 2010), and to start romantic relations (Collins et al.,

2009). Another aspect associated with adolescence is the tendency to question rules set by parents and other well-established authorities, which may lead to more risk-taking and deviant behaviors (Leather, 2009; Cioban et al., 2021). In general, social experiences have a huge impact on how well adolescents meet the multifaceted challenges that characterize their transition to adulthood.

Interestingly, girls and boys may differ in the type of experiences they are seeking (Perry & Pauletti, 2011). The literature suggests that risk-taking and deviant behaviors – especially in the company of peers – are more widespread among teenage boys (e.g., Byrnes et al., 1999; Erickson et al., 2000), whereas girls put special emphasis on meeting with close friends (e.g., Rudolph & Dodson, 2022) and their physical attractiveness to peers (e.g., Raible-Destan et al., 2021). Such preferences are always linked to cultural and time-bound ideas about gender roles. What most healthy developing adolescents have in common, though, is that they want to explore the social world beyond the narrow boundaries of their home and family environment, with the goal of becoming independent.

During the past decades, the internet with its multiple opportunities to inform and entertain oneself, but also to

✉ Akiko Obokata
akiko.obokata@psychologie.uni-heidelberg.de

¹ Heidelberg University, Hauptstraße 47-51, 69117 Heidelberg, Germany

² Shiraume Gakuen University, Tokyo, Japan

communicate via instant messaging, social media platforms, chat rooms, and other virtual meeting points has dramatically changed the life of young people. Adolescents living in industrialized countries can hardly imagine life without communicating via their smartphones and/or computers on a regular basis. In the US, 95% of 13-to-17-year-olds have a smartphone or at least access to one, and 45% of all teens say that they are online on a near-constant basis (Anderson & Jiang, 2018). In 2019, 52% of a European sample of adolescents used a portable computer to access the internet, and as many as 92% used mobile phones (Eurostat, 2021). Similar data comes from Asia. In Japan, the internet penetration rate among 6-to-12-year-olds exceeds 80.7%, and among 13-to-19-year-olds, it even reaches 96.6% (Statista, 2021). Hence, online communication plays a key role in the social life of adolescents today.

In most cases, teens seem to communicate online with people they already know (Gross, 2004), but there is growing evidence indicating that adolescents also become engaged in online communication with strangers (OCS). Smahel et al. (2020) reports that 37% of 9-to-16-year-olds in Europe have already experienced OCS. Similar percentages have been reported for teenagers in different South and Middle American countries (Trucco & Palma, 2020), suggesting that OCS is fairly widespread among adolescents today.

OCS may be harmless, for example when playing a video game, searching for information, or exchanging ideas with peers. By doing this, adolescents develop unique values that differ from the larger population, thus forming their own subculture (e.g., Cloward & Ohlin 1960), which is known to support identity formation (Subrahmanyam & Greenfield, 2008). However, OCS can also become harmful: When strangers contact teens, they may have sexual or criminal intentions (Wurtele & Kenny, 2010). Adolescents posting personal pictures and images often do not think about the potential consequences (Lenhart & Madden, 2007), such as being approached by strangers in inappropriate ways. Many parents thus fear the risk of sexual solicitation (George & Odgers, 2015; Savoia et al., 2021) and victimization of their child.

Among university-aged women, 84% have already received sexually inappropriate messages from strangers via the internet; this typically starts much earlier – i.e., at 12 to 14 years (Salerno-Ferraro et al., 2021). In accordance with these findings, cases of sexual victimization are known to increase when adolescents enter junior high school in Japan (National Police Agency in Japan, 2020). Young adolescents are vulnerable because they have not yet acquired strategies to deal with strangers online. However, Groenestein et al. (2017) found that 43% adolescent girls in the Netherlands were well able to determine whether the online stranger

contacting them was a peer or an adult with a potentially sexual intention. Most participants of this study assumed that “just talking” was safe as long as the conversation topic remained innocent and no private details were shared.

As suggested by this finding, many adolescents think that they can handle being approached by strangers online. In line with this assumption, Salerno-Ferraro et al. (2021) report that many female adolescents facing inappropriate online approaches with sexual intentions start to ignore or block the sender (Salerno-Ferraro et al., 2021). Ingram (2020) who studied 12-to-15-year-olds in Colombia showed that the awareness of risks associated with online communication does not always have an impact on actual behavior, however. The authors suggest that adolescents adopt the attitude towards OCS from peers, because adolescence is a period in which peer pressure is fairly strong – also regarding the acceptance of OCS (Heirman et al., 2016). According to Peter et al. (2006), 12-to-19-year-olds justify OCS with harmless reasons like entertainment, getting to know new people, or compensating for a lack of social skills in direct interactions. Evidently, OCS can stabilize adolescents and the majority of adolescents who become engaged in OCS say that they feel happy after meeting strangers online (Smahel et al., 2020), thus pointing to its potential positive impact on adolescent development.

Taken together, adolescence should be regarded as a critical period when it comes to dealing with OCS. On the one hand, it is fairly common among adolescents and serves to meet their basic needs for social exchange, exploration, and privacy, thereby supporting their independence and identity formation. It can strengthen youth development by encouraging adolescents to take an active role not only in establishing relationships, but also in responding to approaches by others, and it is typically associated with positive feelings. On the other hand, it carries well-known risks, like sexual harassment and abuse by strangers. In any case, adolescents experience high peer pressure to become engaged in OCS. In order to evaluate the benefits and disadvantages of OCS for youth development it seems important to learn more about whether OCS is associated with other risk-taking activities in adolescence and to clarify which factors promote or prevent corresponding behaviors.

OCS and delinquency – determining factors

Relation between OCS and delinquency Adolescents who accept online friendship requests from individuals with weaker or non-preexisting ties tend to show other risky behaviors, as well (Dodel et al., 2021). If they report online sexual solicitation, they show substance abuse and delinquent behaviors more often (Mitchell et al., 2007). A

one-year longitudinal study found that deviant photo posting on social media predicted increases in young adults' problematic alcohol use over time (Szwedo et al., 2012). These findings suggest that OCS and mild delinquency often co-occur, raising the question about common underlying causes.

The role of parental behavior. It is well-known that parental behavior has a huge impact on child development that seems to decrease gradually during adolescence. When it comes OCS and delinquency, two aspects of parental behavior seem of special interest: parental maltreatment and parental monitoring of contacts. With respect to parental maltreatment, it seems important to note that girls who have been abused as children are more likely to meet someone in real life whom they got to know online (Noll et al., 2009) and that they also carry a higher risk of becoming sexually victimized online (Wolak et al., 2008). Similarly, parental violence is associated with multiple forms of delinquent behavior in adolescence (Manzoni & Schwarzenegger, 2019; Özbay, 2005).

But what about parents who try to protect their offspring by monitoring their online and offline contacts? Multiple studies suggest that parental monitoring has a strong impact on children's engagement in risky behaviors, such as substance use (Brown et al., 1993; Dishion & McMahon, 1998; Ledoux et al., 2002; Mounts, 2002). Even though some studies indicate that poor parental monitoring is associated with an increased risk for adolescents to experience internet harassment (Ybarra et al., 2007), others suggest that it does not have a great impact on problematic online activities (Kim & Kim, 2015). It does seem to increase the risk of becoming engaged in delinquent behaviors, however (Hoeve et al., 2009).

Taken together, it seems well possible that parental maltreatment and poor parental monitoring increases the risk of OCS and the likelihood of displaying various types of delinquent behaviors.

The role of adolescent characteristics. When looking at adolescent characteristics as potential risk factors for OCS and mild delinquency, existing studies show that teens with symptoms of depression and/or anxiety prefer online to offline communication (e.g., Pierce 2009) and show problematic internet usage more often (Park et al., 2013). In contrast to these findings a recent meta-analysis found that people who are less fearful meet strangers more often (Sandstrom & Boothby, 2021) which may also apply to OCS. Regarding delinquency, existing studies indicate empirical links to depressive symptoms (Kofler et al., 2011; Leas & Mellor, 2000).

Yet another personality variable associated with problematic online behavior (unauthorized ID use; Kim & Kim 2015) and delinquency (e.g., Coyne et al., 2019; Farrington

et al., 2016; Vazsonyi et al., 2017) is self-control, suggesting that a lack of self-control is associated with more deviant behavior (see also Ben-Fadhel & Mathluthi, 2021).

In sum, adolescent characteristics like depressive symptoms or a lack of self-control seem to go along with an increased risk for OCS and delinquent activities.

The impact of general internet usages. Apart from parental and adolescent characteristics, the variability and frequency of internet usage might have an impact on OCS, as many online programs promote this type of communication. Empirical evidence supporting this view is still largely missing, however. Ngo & Paternoster (2011) report that the impact of time spent online is associated with meeting strangers originally contacted online (Mýlek et al., 2021). Whether this also applies to adolescents still needs to be determined. Some studies show that certain forms of internet usage (i.e., internet gambling; Brunell et al., 2012) are clearly linked to delinquent behaviors, thus indicating that the variability of internet usage may also be associated with juvenile delinquency.

Aims of the current study

As demonstrated in the previous paragraphs, OCS is related to psychosocial development during adolescence. However, there are two general perspectives on its role for youth development. One is guided by research which examined associations between OCS and problematic behavior, such as acts of mild delinquency, which are known to be associated with certain familial and personal risk factors. The other approach is guided by an analysis of the modern life of adolescents in which online communication plays a crucial role. Here, OCS is not seen as a problematic behavior, but rather as normal part of everyday internet usage. To better understand OCS, it seems critical to examine whether and how OCS and mild delinquency are related in adolescents and which factors are associated with each of type of behavior, therefore a model-based approach was taken. This approach will allow us to test which factors predict each type of outcome behavior and to directly analyze commonalities as well as differences. Furthermore, we can check whether the same predictors are crucial for girls and boys.

More specifically, we treat (a) internet usage (duration, variability), (b) adolescent personality characteristics (self-control, depression), and (c) parental behavior (violence, monitoring) as independent variables, and both OCS and mild delinquency as dependent variables. Based on existing work, we assume both dependent variables to be related. Different models will be compared for their goodness of fit. Once we have identified the model which best fits to the data, we include gender as a covariate to check whether the

identified empirical relations are all equally relevant for girls and boys. This is necessary as several of the above-mentioned parameters are known to vary between girls and boys in adolescence (e.g., Savoia et al., 2021; Svensson, 2003). To our knowledge, this is the first study which combines multiple risk factors and systematically compares their impact for OCS and mild delinquency among adolescents using model-based testing.

Methods

This study received approval from Shiraume Gakuen University Ethics Review Board.

Participants and Procedure

An anonymous questionnaire was administrated to Japanese junior high school students in 2017. A total of 2287 students from five schools were recruited. After obtaining permission to carry out questionnaires from the principal of each school, homeroom teachers were asked to conduct the survey in each of their classes. Students were told that answering the questionnaire was not mandatory and not related to their grades, that they could leave out questions they did not want to answer, and that their data would be kept strictly confidential. After completion, the students put their own questionnaires in an envelope that was distributed with the questionnaire, sealed the envelope, and submitted their questionnaire. Participants who did not answer one-third or more of the questions gave incomplete answers, or responded randomly were excluded from further analysis. The number of remaining cases was rather high 2,074 (90% effective response rate, 1052 boys, 1015 girls, 7 non-respondents; 661 first years, 705 s years, 704 third years, 4 non-respondents).

Since junior high school students typically use the internet via their mobile phones (Japanese Cabinet Office, 2017; Stoilova et al., 2021), we only used the data of students with a mobile phone (1873 students, 930 boys, 938 girls, 5 non-respondents; 595 first years, 643 s years, 634 third years, 3 non-respondents). Among them, 91.4% had a smartphone.

Measures

Online Communication with Strangers (OCS). To assess the critical outcome measure, $i=4$ items were taken from a Japanese Cabinet Office survey (2017). Following the general introductory question (“Have you done any of the following things in the past year?”), participants read each

Table 1 Experience Rate for OCS Among Junior High School Students ($n=2074$)

	Boys n (%)	Girls n (%)	2017 Japanese Cabinet Office Survey (2018) %
I have exchanged messages, e-mails, etc. with people I got to know via the internet	215 (20.5)	317 (31.4)	7.6
I have met in person someone of the same sex that I got to know via the internet	33 (3.1)	88 (8.7)	0.9
I have met in person someone of the opposite sex whom I got to know via the internet	29 (2.8)	44 (4.4)	0.1
I have had problems with relationships with people I got to know via the internet	32 (3.0)	63 (6.3)	0.4

Note: 2017 Japanese Cabinet Office Survey (2018) was included for comparison

item: (1) “I have exchanged messages, e-mails, etc. with people I got to know via the internet”; (2) “I have met in person someone of the same sex whom I got to know via the internet”; (3) “I have met in person someone of the opposite sex whom I got to know via the internet”; (4) “I have had problems with relationships with people I got to know via the internet” (see also Table 1), and they responded by choosing one of the following options: (a) *Not even once*, (b) *1–9 times*, or (c) *10 times or more*. Participants who chose the first option (a) were coded as “non-experienced” (0), and those who chose options (b) or (c) were coded as “experienced” (1). Then, the number of items scoring 1 was added up, resulting in a sum score ranging between 0 and 4. Cronbach’s α for the current sample was $\alpha=0.628$.

Mild Delinquency. To measure mild delinquency, $i=8$ items were taken from Obokata & Muto (2006b), each describing behaviors related to (1) smoking, (2) drinking, (3) shoplifting, (4) skipping school, (5) playing with the friends till late without parental permission, (6) stealing or using a bicycle without permission, (7) taking money from home, or (8) sleeping at friend’s house without parental permission. The response format, the coding scheme, and the scoring procedure were identical to the one used for exchanging messages, resulting in scores ranging between 0 and 8. Cronbach’s α for the current sample was $\alpha=0.678$.

Internet Usage: Duration. For the question “How much time do you spend using the internet on your mobile phone each weekday (excluding weekends)?”, participants responded by indicating a certain number of minutes and/or hours (free format answer).

Internet Usage: Variability. When being asked “How often do you use each of the following applications on mobile phones, computers, tablets, game consoles, etc.?”, participants gave answers for each of eight different tools

(LINE, Twitter, e-mail, search engines, games, blogs, watching videos, listening to music), by choosing one of four different options: (1) *Every day*, (2) *Two or three times a week*, (3) *Rarely*, or (4) *Never*. Students who chose the answer *Every day*, or *Two or three times a week* were rated as using the tool on a regular basis (score 1) and those who chose the options *Rarely*, or *Never* were rated as not using the tool on a regular basis (score 0). Then, the number of tools used on a regular basis was added up, resulting in a sum score that could range between 0 and 8; the higher the score, the more variable internet usage was assumed to be.

Adolescents' Personality Characteristics: Self-Control. We used $i=10$ items from the Low Self-Control Scale (Grasmick et al., 1993). Cronbach's α for the current sample was $\alpha=0.772$. Items were rated on a four-point Likert scale ranging from 1 (*does not apply at all*) to 4 (*applies very well*). The total sum of points divided by the number of items served as the individual score for self-control.

Adolescents' Personality Characteristics: Depression. The Japanese edition (Murata et al., 1996) of the Child Depression Self-Rating Scale (Birleson, 1981) was used. Each item could be rated on a three-point response scale: (1) *Always*, (2) *Sometimes*, or (3) *Never*. Cronbach's α for the current sample was $\alpha=0.856$.

Parental Behavior: Offline Monitoring. Parental monitoring was measured by using $i=4$ items from Obokata & Muto (2006a). Participants read the following sentences: (a) "My parents know where I am when I go out." (b) "My parents know who my friends are.", (c) "My parents immediately know if I have something I did not have before.", and (d) "My parents often ask me about what happens at school." Items were rated on a four-point Likert scale ranging from 1 (*does not apply at all*) to 4 (*applies very well*). The total sum of points divided by the number of items served as the individual score for parental monitoring. Cronbach's α for the current sample was $\alpha=0.722$.

Parental Behavior: Violence. Three items were used from Obokata & Muto (2006a). The items were (1) "My parents hit me when they scold me", (2) "A parent is often violent at home.", and (3) "A parent was violent towards me when I was little." The response format and coding were the same as for the assessment of self-control and parental monitoring. Cronbach's α for the current sample was $\alpha=0.816$.

Data Analysis

To test different models for their fit, path analysis was conducted in AMOS 25. Different Models (see below) were compared with respect to their goodness of fit. These comparisons clarified which factors are associated with OCS and mild delinquency. Furthermore, they tested whether both dependent variables are empirically related. Additional

analyses clarified whether integrating gender in the model improved its fit and which paths between independent and dependent variables were significant for boys and girls, respectively, thus focusing on potential gender differences. Figure 1 illustrates Model 1 as an example.

In Model 1, parental factors, adolescents' personality characteristics, and factors associated with internet usage were all assumed to influence both dependent variables (OCS and mild delinquency).

In Model 2, "variability of internet usage" was assumed to be uniquely associated with "OCS", as we did not find any work suggesting that the variability of internet usage is related to mild delinquency; however, it seems plausible that adolescents who use different programs and/or media platforms are also more likely to become engaged in OCS. Otherwise, the model was comparable to Model 1.

In Model 3, "parental monitoring" was assumed to be uniquely associated with "mild delinquency", so the path from "parental monitoring" to "OCS" was removed. This seemed justified, as several other studies show that adolescents who are monitored by their parents more closely show delinquent behaviors less often, whereas studies indicating that parental monitoring is related to OCS are lacking.

Models 2 and 3 were thus more specific, allowing only for relations clearly backed up by previous work reported in the literature.

The model with the best fit among these three models was then compared to Model 4. In Model 4, the paths from "OCS" to "delinquency" were removed, thus assuming no association between them. So far, we only have indirect evidence supporting the claim that both dependent variables are related. Hence, we wanted to check whether assuming a relation or not would lead to a better model fit.

Once the model that best fits our data best was identified, the role of gender was explored by comparing the best-fitting model in two versions: Model 5 assumed gender equality for all relations between independent and dependent factors, whereas Model 6 did not.

Full information maximum likelihood (FIML) was used to estimate missing data. The model fit was evaluated based on different indices. Given the sensitivity of the chi-square statistic for the sample size (Hox & Bechger, 1999), the Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) were used. The CFI is truncated to range from 0 to 1, with values close to 1 indicating a very good fit (Bentler, 1990). A RMSEA value of about 0.05 or less indicates a close fit of the model (Browne & Cudeck, 1992), and Akaike's information criterion (AIC) was used to compare the fit of different models. The lower the AIC, the better the model fits the empirical data. A chi-square test was conducted to test whether there were differences between models when both models to be compared

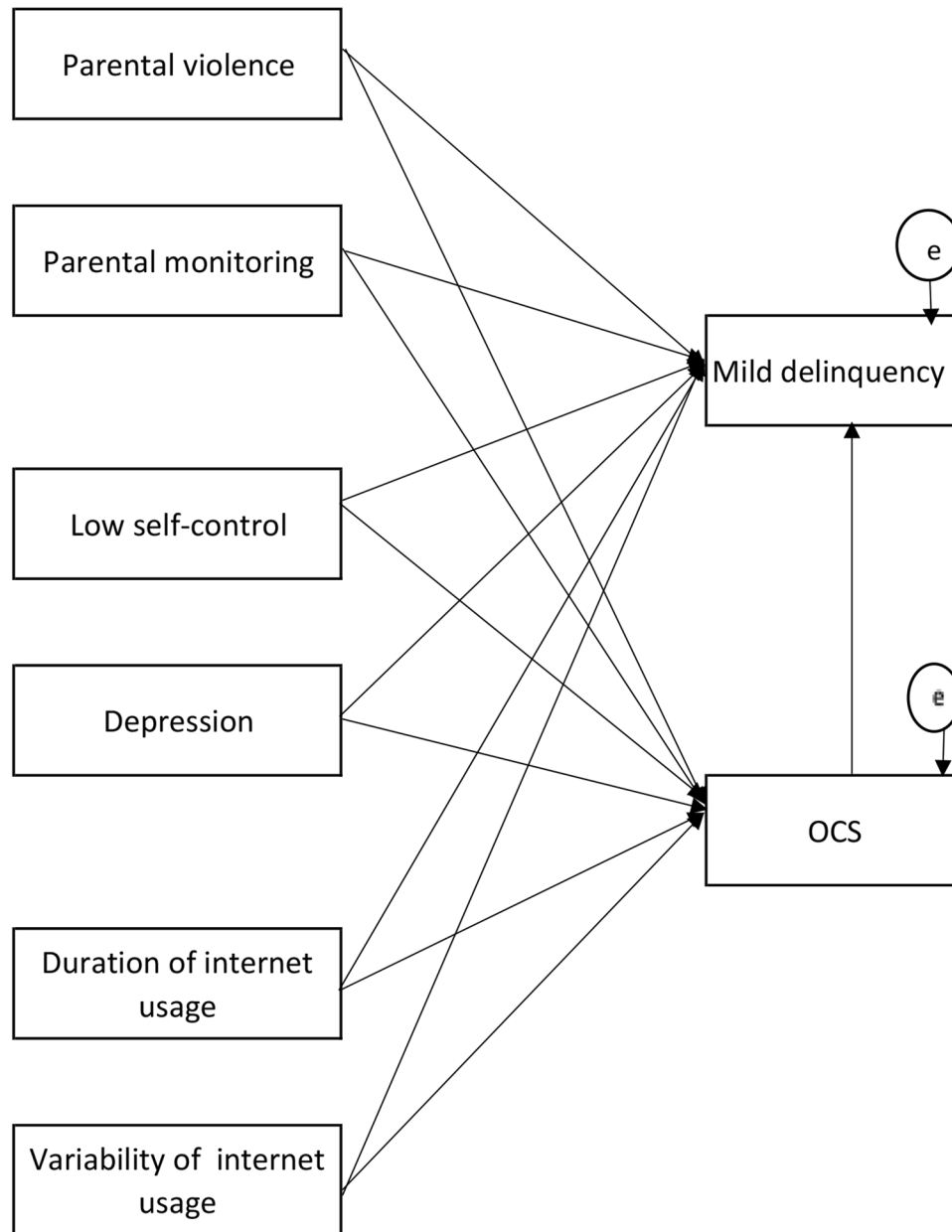


Fig. 1 Hypothesized Pathways of Model 1. *Note.* There are covariates between each of the six independent variables, but they are not shown in the figure

had a fairly good fit; it was also conducted to test for the significance of potential gender differences in the validated models.

Results

Descriptive statistics

Table 1 illustrates that the experience rate of OCS was generally more common than mild delinquency (See Tables 1

and 2). In addition, the current study showed the rate of experiencing OCS was higher than reported in the survey by the Japanese Cabinet Office (2018, See Table 1). In contrast to the present study, the mentioned survey included adolescents who lived nationwide and were mostly interviewed individually by researchers. Furthermore, we found that girls reached higher scores than boys on each item of the OCS scale than boys did. As revealed by Table 3, each variable assessed in the current study correlated significantly with all others, with only two exceptions: the variability of internet usage did not show any substantial relation with

Table 2 Experience Rate for Mild Delinquency Among Junior High School Students (*n*=2074)

	Boys <i>n</i> (%)	Girls <i>n</i> (%)
Smoking	26 (2.5)	8 (0.8)
Skipping school	115 (11.0)	118 (11.7)
Drinking alcohol	28 (2.7)	17 (1.7)
Playing with friends till late without parental permission	193 (18.4)	157 (15.6)
Shoplifting	22 (2.1)	7 (0.7)
Stealing or using bicycle without permission	7 (0.7)	3 (0.3)
Taking money from home	58 (5.5)	32 (3.2)
Sleeping over without parental permission	23 (2.2)	16 (1.6)

parental violence or depression. However, in general, individual correlation coefficients were rather low (i.e., *r* < .35).

Path analysis with OCS and mild delinquency as outcome variables

As revealed by Table 4, Model 1 did not provide a sufficient fit to the data, thus calling for further specification of the relations between variables. Models 2 and 3 both revealed a good fit of comparable size ($\chi^2(1) = 1.744$, *n.s.*). Because both models fitted equally well, we decided to choose Model 2 which better matches theoretical arguments based on previous work. When comparing Model 2, assuming a relation

between OCS and mild delinquency, and Model 4, assuming no relation between these two variables, Model 2 provided a better fit ($\chi^2(1) = 68.727$, *p* < .001; see Table 4), thus indicating that both outcome variables are related.

In the next step, we compared Models 5 and 6 to clarify the role of gender. A significant chi-square test indicated that Model 6 (postulating gender differences) provided a better fit than Model 5 (not considering gender) ($\chi^2(27) = 62.974$, *p* < .001). Model 6 thus provided the final model and revealed a good fit ($\chi^2(2) = 4.508$ (*p* = .105), RMSEA = 0.026, CFI = 0.998, see Table 4). The corresponding models for boys and girls are presented in Figs. 2 and 3 respectively.

Variability of internet usage was positively associated with OCS alone, that is, not with mild delinquency, and the duration of internet usage was positively associated with both outcome measures.

Interestingly, parental monitoring was negatively associated with OCS among girls and with mild delinquency among boys. Parental violence revealed a positive association with mild delinquency in both gender groups, but with OCS, this association was only found in girls. Significant associations were also found between self-control and both dependent variables in girls. Depression was positively associated with mild delinquency among boys and with OCS in both gender groups. Furthermore, OCS was positively associated with mild delinquency. The path coefficient was stronger for boys than for girls (*p* < .05).

Table 3 Correlations, Means, and Standard Deviations Among the Variables (*n* = 1873)

	1	2	3	4	5	6	7	8
1. OCS	-							
2. Mild delinquency	0.287**	-						
3. Parental violence	0.150**	0.214**	-					
4. Parental monitoring	-0.151**	-0.206**	-0.149**	-				
5. Low self-control	0.163**	0.241**	0.233**	-0.168**	-			
6. Depression	0.234**	0.204**	0.248**	-0.314**	0.210**	-		
7. Duration of internet usage (min)	0.236**	0.211**	0.069**	-0.190**	0.131**	0.144**	-	
8. Variability of internet usage	0.279**	0.166**	0.039	-0.098**	0.139**	0.028	0.341**	-
M	0.413	0.421	1.420	3.046	2.137	11.166	154.774	4.906
SD	0.798	0.886	0.678	0.683	0.515	6.408	126.756	1.463

Note. ****p* < .001

Table 4 The Indices of the Model Fits

Model	Chi-square	df	<i>p</i> value	RMSEA	CFI	AIC	Description
Model 1	0.000	0	-	0.146	1.000	88	
Model 2	4.684	1	0.030	0.044	0.997	90.684	Removed the path from variability of internet usage to delinquency from Model 1
Model 3	6.428	2	0.040	0.034	0.997	90.428	Removed the path from parental monitoring to OCS from Model 2
Model 4	73.411	2	0.000	0.138	0.950	157.185	Removed the path from OCS to delinquency from Model 2
Model 5	67.482	29	0.000	0.027	0.974	185.482	Multiple group analysis by gender based on Model 2; no differences between genders
Model 6	4.508	2	0.105	0.026	0.998	176.508	Multiple group analysis by gender based on Model 2; differences between genders

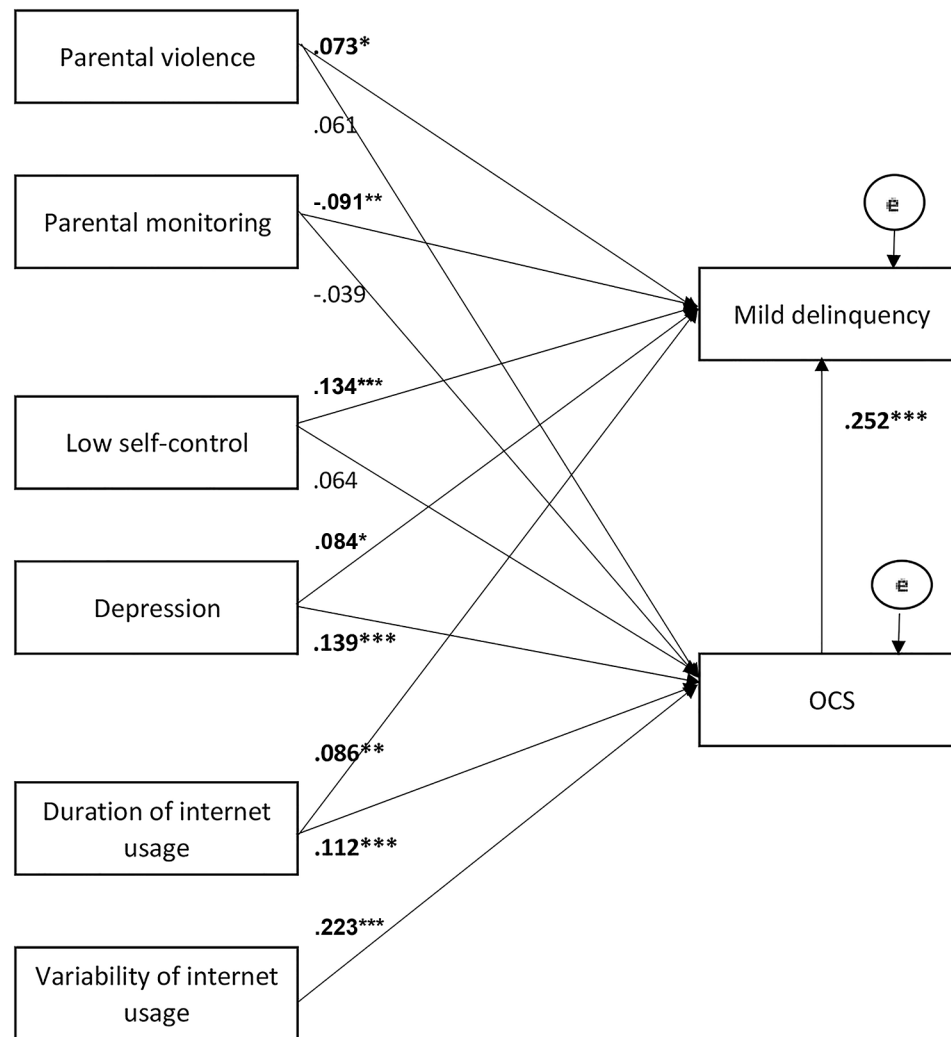


Fig. 2 The Result of Model 6 (Boys). *Note.* Direct paths represent standardized b parameter estimates. Numbers in bold show the results of significant coefficients; normal text shows the results of non significant coefficients. Covariates between each of the six independent variables are not shown in the figure. * $p < .05$, ** $p < .01$, *** $p < .001$

The paths from low self-control, parental violence, and parental monitoring to OCS among boys and from parental monitoring and depression to delinquency among girls were not significant.

Discussion

During early adolescence, the frequency of online communication with strangers (OCS) increases. OCS is associated with positive psychosocial development (Subrahmanyam & Greenfield, 2008) but also with certain risks, like becoming a victim of online harassment (Savoia et al., 2021), sexual exploitation, or violence (Wolak et al., 2004). While some studies found that adolescents with psychosocial problems are more vulnerable to OCS (Dodel et al., 2021), others

indicate that OCS can also be found frequently among adolescents who have no psychological or behavioral problems (Smahel et al., 2020), thus raising the question of whether OCS during adolescence should be considered as a type of deviant behavior like delinquency or as a normal behavior (see Introduction). The answer to this question may vary according to the functions that OCS has for different subgroups, such as boys and girls.

In a large survey among Japanese junior high school students, we explored the relation between internet usage (duration, variability), parental behavior (i.e., offline-monitoring, violence), and adolescents' characteristics (i.e., depression, self-control) as potential predictors of OCS and delinquency using a model-based approach and controlling for gender as a potential covariate. Results indicate that some factors are exclusively related to either OCS or mild

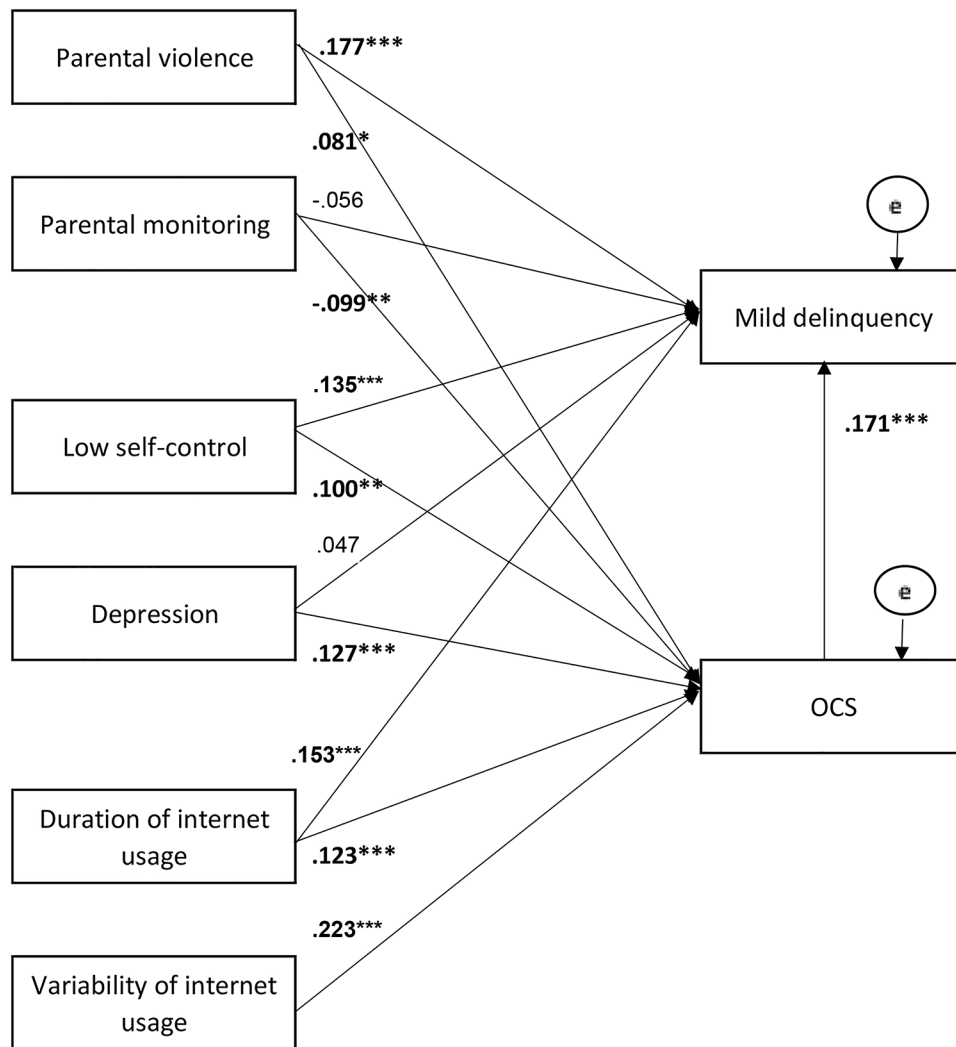


Fig. 3 The Result of Model 6 (Girls). *Note.* Direct paths represent standardized *b* parameter estimates. Numbers in bold show the results of significant coefficients; normal text shows the results of non significant coefficients. Covariates between each of the six independent variables are not shown in the figure. **p* < .05, ***p* < .01, ****p* < .001

delinquency whereas other factors are related to both outcome variables in parallel. Furthermore, we found that OCS and mild delinquency are associated and that some of the relations with internet usage, parental behavior, and adolescents’ characteristics vary by gender. Overall, our findings suggest that OCS has a different function for boys and girls. A more detailed discussion of specific results follows.

Differing from findings obtained in Europe (Smahel et al., 2020), the rate of OCS in the current study in Japan (Tokyo) is higher in girls than boys, and generally exceeds data from a survey by the Japanese Cabinet Office (2018). Since we collected the data anonymously, general response biases in terms of social desirability may have been less influential in the present study, thus contributing to higher means of OCS.

Internet usage (duration, variability), OCS, and mild delinquency

In line with our initial expectations the duration of internet usage was positively associated with OCS (see also Mýlek et al., 2021). This makes sense as adolescents who use smartphones on a daily basis engage in online communication more often than those who use smartphones less frequently (Mascheroni & Ólafsson, 2016). Interestingly, the duration of internet usage also correlated positively with mild delinquent behaviors, such as shoplifting, smoking, and drinking alcohol. This may partly result from the following dynamic. Today, adolescents spend significant amounts of time interacting with their friends online (Anderson & Jiang, 2018) where they easily get into touch with deviant peers. If these deviant peers become friends, this increases peer pressure

to become engaged in delinquent activities (Berndt et al., 1999). Peer pressure may also impact OCS. If peers suggest that OCS is a normal behavior, then spending time online with friends also reinforces OCS. In addition to this mechanism, joint causes play some role for explaining the link between OCS and delinquency. For example, social frustration, a lack of parental control / interest in the adolescent, or a lack of self-control may support both types of behavior.

Interestingly, the empirical relation observed was weak for boys and somewhat stronger for girls. Boys spend much time online playing video games (Park, 2009), and may thus feel less tempted to become engaged in delinquent activities. Female adolescents, on the other hand, typically use the internet in more interactive ways (Park, 2009), thus increasing their risk of getting in contact with strangers or deviant peers that encourage delinquent activities. Consistent with this argument, variability of internet usage was associated with OCS but not with mild delinquency. Adolescents mainly interested in making social contact online may use a broader variety of social media platforms and programs to present personal information and/or to get to know other people (Subrahmanyam & Greenfield, 2008), whereas adolescents who mainly use the internet for entertainment purposes are likely to use fewer programs and options, thus meeting strangers online less often. Given that most adolescents are online on a daily basis (Anderson & Jiang, 2018), associations between the duration and variability of internet usage and OCS may indicate that OCS is becoming a “normal phenomenon” (Smahel et al., 2020).

Parental behavior and OCS / mild delinquency

Parental maltreatment correlated positively with both OCS and mild delinquency. According to previous work, adolescents who have problems with their parents seem to be more vulnerable to OCS (Wolak et al., 2008). Unexpectedly, parental offline monitoring (i.e., wanting to know whom the adolescent considers friend(s) and where they meet) was associated with less OCS in girls but not in boys. In many cultures, girls are more closely monitored by their parents than boys (e.g., Nilsson 2017). This is also the case in Japan and may explain why Japanese girls show less problem behavior, including delinquent activities (Svensson, 2003). At the same time, OCS was relatively high among girls in the current study, which suggests that parental monitoring was less effective at preventing this type of behavior. Nonetheless, we can say that girls who are monitored more closely by their parents experience OCS less often, thus indicating that parental monitoring serves as a protective factor – at least for OCS among girls. Contrary to some other findings

(e.g., Barnes et al., 2006), parental monitoring did not show any systematic association with mild delinquency among girls, whereas parental violence did. According to Atherton et al. (2020), parental hostility and low parental monitoring predict the slope of development of effortful control, with the former having more impact than the latter. Hence, one could speculate that parental maltreatment increases the risk of becoming delinquent in both gender groups, but that parental monitoring of social contacts reduced OCS (in girls but not boys). The gender differences observed in the present study call for a control of gender effects when exploring the relations between parental behavior and deviant or risky activities in adolescents.

Adolescents' personality characteristics, OCS, and mild delinquency

Regarding adolescents' personality characteristics, depression played an important role in predicting OCS. This confirms the finding that adolescents with a diagnosis of depression reveal more OCS than the general population (Radovic et al., 2017). Adolescents who do not get along well with their parents report more symptoms of loneliness and depression (Wolak et al., 2008), which in turn is associated with more frequent visits to online chatrooms (Ybarra et al., 2005) to get information on their symptoms (Pretorius et al., 2019) or other kinds of support. As explained by social compensation theory, lonely adolescents often gain benefits from OCS (Valkenburg & Peter, 2011). Nevertheless, children suffering from depression often show impaired social skills (Segrin, 2000) which may lead them to respond in maladaptive ways to inappropriate messages from strangers. As a result, they may carry a higher risk to become abused by strangers they meet online. This has important potential implications for parents and psychotherapists, as they should talk about OCS with adolescents and ensure that they know how to handle such online contacts. The relevance of talking about online communication also becomes evident when looking at a study conducted by Radovic et al. (2017), who found that adolescents suffering from depressive symptoms shift their social media use from negative to more positive when receiving treatment.

Gender-specific patterns of deviant and risk-taking behavior

Interestingly, the risk factors for mild delinquency among boys show a considerable overlap with those for OCS among girls. This reflects the finding that adolescent girls put special emphasis on social communication, whereas

boys reveal a strong orientation towards social activities with peers (e.g., Rose & Asher 2017). We found that factors associated with OCS also vary between gender groups. Girls with low self-control are more likely to engage in OCS, but this does not seem to be the case with boys.

Low self-control and parental violence increase delinquency (Özbay, 2005) as well as OCS in girls who visit dating sites and agree to meet strangers in person (Obokata & Muto, 2007). This is in line with general theory of crime (Gottfredson & Hirschi, 1990) stating that people who lack self-control are more likely to engage in crime and analogous behavior (Gottfredson & Hirschi, 1990). In addition, a previous study showed that risk-seeking is a strong predictor of delinquency among girls (LaGrange & Silverman, 1999), which again points to the conclusion that OCS may have a similar function for girls as delinquency has for boys, i.e., to explore new terrain by acting against social norms.

Gender differences were also found for mild delinquency as an outcome variable, i.e., parental monitoring and depression were only associated with mild delinquency in boys but not in girls. LaGrange & Silverman (1999) suggested there may be different patterns of causality leading to male and female non-normative behaviors. This would be consistent with Deviance Regulation Theory, stating that salient reference groups play a crucial role for creating norms among adolescents (Blanton & Burkley, 2008). These salient reference groups are likely to differ between girls and boys who are still trying to form their own gender identity. Also, gender differences in risk-taking related to internet usage may reflect social factors, as girls are more likely than boys to become victims of violence and sexual abuse offline if they show OCS (Savoia et al., 2021). Future studies investigating factors that predict risky behavior in adolescence should thus consider potential gender differences.

Relations between OCS and mild delinquency

Lastly, we found that OCS and mild delinquency were empirically related, which is in line with previous research indicating that deviant online behavior predicts later deviant offline behavior (Szwedo et al., 2012). In addition, another longitudinal study showed that an increase in social media use aiming at connecting with others was associated with later delinquency (Stockdale & Coyne, 2020). We also found that the corresponding relation between OCS and mild delinquency was stronger among boys than among girls. As discussed above, OCS is likely to have a different meaning for boys and girls. Since self-control is not associated with OCS among boys, OCS may expose boys to the risk of meeting deviant peers and showing delinquent behavior. This would

be consistent with the finding that online chatting is considered to be an important tool for adolescents who also drink alcohol in order to improve their social status (Larm et al., 2017). In addition, boys make friends through online networks (i.e., playing online games) more often than girls do (Lenhart & Madden, 2007). Thus, it may well be that boys who are at risk of becoming delinquent make friends with others who have similar interests via the internet (e.g., to arrange meetings for joint activities), thereby increasing the likelihood of becoming engaged in delinquent behaviors.

In sum, we conclude that OCS has become a widely accepted and frequent behavior among adolescents today. Although it appears to be more widespread among those adolescents who show a general tendency toward deviant behavior, who experience parental maltreatment and/or who are psychologically vulnerable. Girls with a lack of self-control and a lack of parental monitoring as well as boys with depressive symptoms seem to be especially vulnerable to OCS.

Limitations and future directions

The current study has several limitations. First, it refers to self-reports only. Hence, social desirability may have distorted information on the duration of internet usage, OCS, and mild delinquency. Furthermore, self-reports on adolescents' feelings and personality traits may differ from parental reports (Hardy et al., 2020). Future studies should also measure the adolescents' time online more objectively. In general, a multi-method approach would help to validate the reported findings.

Second, the present study is purely cross-sectional, thus precluding the ability to draw causal conclusions. Even though the data reported is largely consistent with existing work suggesting that depression promotes OCS and OCS may lead to mild delinquency, we cannot rule out that OCS increases depressive symptoms and mild delinquency promotes OCS. Only by using a longitudinal design and cross-lagged panel analyses will it be possible to determine the direction of the reported relations.

Third, some path coefficients for OCS and mild delinquency were statistically significant but quite small (< 0.10), similar to the path between duration of internet usage and mild delinquency in boys (0.086). Future research should investigate whether these findings can be replicated.

Lastly, this study did not investigate the impact of peers on OCS and delinquency, even though peers are known to play a key role in adolescence. Yet another potential mediator between duration of internet usage and mild delinquency could be interactions with deviant friends. Further research is needed to examine the type of friends that adolescents

have (online and offline), i.e., whether they are delinquent or not, in order to better understand the impact of peers in this context.

Conclusions

Today's youth spends a lot of time online engaging in a variety of online activities, and OCS has become a common phenomenon. We examined the association between OCS and mild delinquency. Firstly, the variability of internet usage was associated with OCS, but not with mild delinquency. Gender played a significant role in this context. (1) Low self-control and the experience of parental violence were found to be associated with mild delinquency in both gender groups, but to be associated with OCS in girls only. (2) Similarly, depression was associated with OCS in girls and boys, but with mild delinquency in boys only. (3) Less parental monitoring was associated with more OCS among girls and with mild delinquency among boys. (4) While OCS and mild delinquency seem to have a similar function for girls, this was not the case for boys. Our findings extend existing findings by revealing associations between OCS and offline problem behavior. It can thus be useful for developing targeted programs to prevent adolescent problems associated with deviant behavior from becoming more serious. As demonstrated in the present report, it seems important to consider multiple potential risk factors in combination and to take gender differences into account when trying to shed light on adolescent deviant behavior and normal development.

Authors' contributions A.O. conceived the study, elaborated its design, coordinated the data collection and acquired the data, performed statistical analyses, interpreted results, and drafted the manuscript. S.P. participated in the interpretation of the data and helped with drafting and reviewing the manuscript, including critical revisions of important intellectual content. Both authors read and approved the final manuscript.

Funding Open Access funding enabled and organized by Projekt DEAL. This study was supported by Shiraume Gakuen University and Collage, Center for Education and Welfare Studies.

Data Availability The datasets analyzed during the current study are not publicly available but are available from the corresponding author upon reasonable request.

Declarations

Conflicting of Interests The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval This study received approval from the Shiraume Gakuen University Ethics Review Board.

Informed consent Informed consent was obtained from each individual participant included in the study.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Anderson, M., & Jiang, J. (2018). Teens, social media habits and experiences 2018. *Pew Research Center*. Retrieved Jun 2, 2021, from <https://www.pewresearch.org/internet/2018/11/28/teens-social-media-habits-and-experiences/>
- Atherton, O. E., Lawson, K. M., & Robins, R. W. (2020). The development of effortful control from late childhood to young adulthood. *Journal of Personality and Social Psychology*, *119*(2), 417–456. <https://doi.org/10.1037/pspp0000283>
- Barnes, G. M., Hoffman, J. H., Welte, J. W., Farrell, M. P., & Dintcheff, B. A. (2006). Effects of parental monitoring and peer deviance on substance use and delinquency. *Journal of Marriage and Family*, *68*(4), 1084–1104. <https://doi.org/10.1111/j.1741-3737.2006.00315.x>
- Ben Fadhel, S., & Mathluthi, S. (2021). Deviant behavior and self-control in adolescence: A study in a Tunisian context. *International Journal of Academic Research and Reflection*, *9*(1), 1–9
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*(2), 238–246. <https://doi.org/10.1037/0033-2909.107.2.238>
- Berndt, T. J., Hawkins, J. A., & Jiao, Z. (1999). Influences of friends and friendships on adjustment to junior high school. *Merrill-Palmer Quarterly*, *45*(1), 13–41
- Birleson, P. (1981). The validity of depressive disorder in childhood and the development of a self-rating scale: A research report. *Journal of Child Psychology and Psychiatry*, *22*, 73–88
- Blanton, H., & Burkley, M. (2008). Deviance regulation theory: Applications to adolescent social influence. In M. J. Prinstein, & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents* (pp. 94–121). The Guilford Press
- Brown, B. B., Mounts, N., Lamborn, S. D., & Steinberg, L. (1993). Parenting practices and peer group affiliation in adolescence. *Child development*, *64*(2), 467–482. <https://doi.org/10.1111/j.1467-8624.1993.tb02922.x>
- Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods and Research*, *21*, 230–258. <https://doi.org/10.1177/0049124192021002005>
- Brunelle, N., Leclerc, D., Cousineau, M. M., Dufour, M., Gendron, A., & Martin, I. (2012). Internet gambling, substance use, and delinquent behavior: An adolescent deviant behavior involvement pattern. *Psychology of Addictive Behaviors*, *26*(2), 364–370. <https://doi.org/10.1037/a0027079>
- Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin*, *125*(3), 367–383. <https://doi.org/10.1037/0033-2909.125.3.367>

- Cioban, S., Lazăr, A. R., Bacter, C., & Hatos, A. (2021). Adolescent Deviance and Cyber-Deviance. A Systematic Literature Review. *Frontiers in psychology, 12*, 748006
- Cloward, R., & Ohlin, L. (1960). *Delinquency and opportunity*. New York: The Free Press
- Collins, W. A., Welsh, D. P., & Furman, W. (2009). Adolescent romantic relationships. *Annual review of psychology, 60*, 631–652. <https://doi.org/10.1146/annurev.psych.60.110707.163459>
- Coyne, S. M., Padilla-Walker, L. M., Holmgren, H. G., & Stockdale, L. A. (2019). Instagrowth: A longitudinal growth mixture model of social media time use across adolescence. *Journal of Research on Adolescence, 29*(4), 897–907. <https://doi.org/10.1111/jora.12424>
- Dishion, T. J., & McMahon, R. J. (1998). Parental monitoring and the prevention of child and adolescent problem behavior: a conceptual and empirical formulation. *Clinical child and family psychology review, 1*(1), 61–75. <https://doi.org/10.1023/a:1021800432380>
- Dodel, M., Menese, P., & Trajtenberg, N. (2021). Someone wants to connect with you?: Predicting Uruguayan kids' replies to online friendship requests. *Global Studies of Childhood, 11*, 344–357. <https://doi.org/10.1177/20436106211027576>
- Erickson, K. G., Crosnoe, R., & Dornbusch, S. M. (2000). A social process model of adolescent deviance: Combining social control and differential association perspectives. *Journal of Youth and Adolescence, 29*(4), 395–425. <https://doi.org/10.1023/A:1005163724952>
- Erikson, E. H. (1968). *Identity, youth and crisis*. New York: W. W. Norton & Company
- Eurostat (2021). *Being young in Europe Today-digital world*. Retrieved Dec 14, 2021, from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Being_young_in_Europe_today_-_digital_world#A_digital_age_divide
- Farrington, D. P., Ttofi, M. M., & Piquero, A. R. (2016). Risk, promotive, and protective factors in youth offending: Results from the Cambridge study in delinquent development. *Journal of Criminal Justice, 45*, 63–70. <https://doi.org/10.1016/j.jcrimjus.2016.02.014>
- George, M. J., & Odgers, C. L. (2015). Seven fears and the science of how mobile technologies may be influencing adolescents in the digital age. *Perspectives on psychological science: a journal of the Association for Psychological Science, 10*(6), 832–851. <https://doi.org/10.1177/1745691615596788>
- Gottfredson, M. R., & Hirschi, T. (1990). *A General Theory of Crime*. Stanford, CA: Stanford University Press
- Grasmick, H. G., Tittle, C. R., Bursik, R. J. Jr., & Arneklev, B. J. (1993). Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency, 30*, 5–29
- Groenestein, E., Baas, N., van Deursen, A. J., & de Jong, M. D. (2017). Strategies and cues adolescents use to assess the age of an online stranger. *Information Communication & Society, 21*(8), 1168–1185. <https://doi.org/10.1080/1369118X.2017.1309443>
- Gross, E. F. (2004). Adolescent Internet use: What we expect, what teens report. *Journal of Applied Developmental Psychology, 25*(6), 633–649. <https://doi.org/10.1016/j.appdev.2004.09.005>
- Hardy, S. A., Baldwin, C. R., Herd, T., & Kim-Spoon, J. (2020). Dynamic associations between religiousness and self-regulation across adolescence into young adulthood. *Developmental psychology, 56*(1), 180–197. <https://doi.org/10.1037/dev0000841>
- Heirman, W., Walrave, M., Vermeulen, A., Ponnet, K., Vandebosch, H., & Hardies, K. (2016). Applying the theory of planned behavior to adolescents' acceptance of online friendship requests sent by strangers. *Telematics and Informatics, 33*(4), 1119–1129. <https://doi.org/10.1016/j.tele.2016.01.002>
- Hoeve, M., Dubas, J. S., Eichelsheim, V. I., van der Laan, P. H., Smeenk, W., & Gerris, J. R. (2009). The relationship between parenting and delinquency: A meta-analysis. *Journal of Abnormal Child Psychology, 37*(6), 749–775. <https://doi.org/10.1007/s10802-009-9310-8>
- Hox, J., & Bechger, T. (1999). Introduction structural equation modeling. *Family Science Review, 11*, 354–373
- Japanese Cabinet Office (2017). *Heisei 27 nendo: Seishonen no Internet riyou kankyo jittai chousa* [The survey on the Internet usage environment for youth in 2016]. Retrieved Jun 2, 2021, from <https://www8.cao.go.jp/youth/youth-harm/chousa/h28/net-jittai/pdf-index.html>
- Japanese Cabinet Office (2018). *Heisei 28 nendo: Seishonen no Internet riyou kankyo jittai chousa* [The survey on the Internet usage environment for youth in 2017]. Retrieved Jun 2, 2021, from <https://www8.cao.go.jp/youth/youth-harm/chousa/h29/net-jittai/pdf-index.html>
- Keijsers, L., & Poulin, F. (2013). Developmental changes in parent-child communication throughout adolescence. *Developmental Psychology, 49*(12), 2301–2308. <https://doi.org/10.1037/a0032217>
- Kim, J. E., & Kim, J. (2015). International note: Teen users' problematic online behavior: using panel data from South Korea. *Journal of Adolescence, 40*, 48–53. <https://doi.org/10.1016/j.adolescence.2015.01.001>
- Kofler, M. J., McCart, M. R., Zajac, K., Ruggiero, K. J., Saunders, B. E., & Kilpatrick, D. G. (2011). Depression and delinquency covariation in an accelerated longitudinal sample of adolescents. *Journal of Consulting and Clinical Psychology, 79*(4), 458–469. <https://doi.org/10.1037/a0024108>
- LaGrange, T. C., & Silverman, R. A. (1999). Low self-control and opportunity: Testing the general theory of crime as an explanation for gender differences in delinquency. *Criminology, 37*, 41–72. <https://doi.org/10.1111/j.1745-9125.1999.tb00479.x>
- Larm, P., Åslund, C., & Nilsson, K. W. (2017). The role of online social network chatting for alcohol use in adolescence: Testing three peer-related pathways in a Swedish population-based sample. *Computers in Human Behavior, 71*, 284–290. <https://doi.org/10.1016/j.chb.2017.02.012>
- Leas, L., & Mellor, D. (2000). Prediction of delinquency: The role of depression, risk-taking, and parental attachment. *Behaviour Change, 17*(3), 155–166. <https://doi.org/10.1375/behc.17.3.155>
- Leather, N. C. (2009). Risk-taking behaviour in adolescence: a literature review. *Journal of child health care for professionals working with children in the hospital and community, 13*(3), 295–304. <https://doi.org/10.1177/1367493509337443>
- Ledoux, S., Miller, P., Choquet, M., & Plant, M. (2002). Family structure, parent-child relationships, and alcohol and other drug use among teenagers in France and the United Kingdom. *Alcohol and alcoholism (Oxford Oxfordshire), 37*(1), 52–60. <https://doi.org/10.1093/alcalc/37.1.52>
- Lenhart, A., & Madden, M. (2007). Teens, privacy and online social networks: How teens manage their online identities and personal information in the age of MySpace. *Pew Internet & American Life Project Report*. Retrieved Aug 3, 2021, from <https://www.pewresearch.org/internet/2007/04/18/teens-privacy-and-online-social-networks/>
- Manzoni, P., & Schwarzenegger, C. (2019). The influence of earlier parental violence on juvenile delinquency: The role of social bonds, self-control, delinquent peer association and moral values as mediators. *European Journal on Criminal Policy and Research, 25*, 225–239. <https://doi.org/10.1007/s10610-018-9392-3>
- Mares, S. H., de Leeuw, R. N., Scholte, R. H., & Engels, R. C. (2010). Facial attractiveness and self-esteem in adolescence. *Journal of clinical child and adolescent psychology: the official journal for the Society of Clinical Child and Adolescent Psychology American Psychological Association Division 39*(5), 627–637. <https://doi.org/10.1080/15374416.2010.501292>

- Mascheroni, G., & Ólafsson, K. (2016). The mobile Internet: Access, use, opportunities and divides among European children. *New Media & Society*, 18(8), 1657–1679. <https://doi.org/10.1177/1461444814567986>
- Mitchell, K. J., Ybarra, M., & Finkelhor, D. (2007). The relative importance of online victimization in understanding depression, delinquency, and substance use. *Child Maltreatment*, 12(4), 314–324. <https://doi.org/10.1177/1077559507305996>
- Mounts, N. S. (2002). Parental management of adolescent peer relationships in context: The role of parenting style. *Journal of Family Psychology*, 16(1), 58–69. <https://doi.org/10.1037/0893-3200.16.1.58>
- Murata, T., Shimizu, A., Mori, Y., & Oushima, S. (1996). Gakkou ni okeru kodomo no utsubyou: Birleson no shoniki utsubyo scale karano kentou [Childhood depressive state in the school situation: Consideration from the Birleson's scale]. *Japanese Journal of Psychiatry*, 1, 131–138
- Mýlek, V., Dedkova, L., & Smahel, D. (2021). Information sources about face-to-face meetings with people from the Internet: Gendered influence on adolescents' risk perception and behavior. *New Media & Society*. <https://doi.org/10.1177/14614448211014823>
- National Police Agency in Japan (2020). *Reiwa gan nen chu ni okeru shounen no hodou oyobi hogo no gaikyo* [Overview of juvenile guidance and protection in 2019] Retrieved August 9, 2021, from https://www.npa.go.jp/safetylife/syonen/hodouhogo_gaikyou/R01.pdf
- Ngo, F. T., & Paternoster, R. (2011). Cybercrime victimization: An examination of individual and situational level factors. *International Journal of Cyber Criminology*, 5, 773
- Nilsson, E. L. (2017). Analyzing gender differences in the relationship between family influences and adolescent offending among boys and girls. *Child Indicators Research*, 10, 1079–1094. <https://doi.org/10.1007/s12187-016-9435-6>
- Noll, J. G., Shenk, C. E., Barnes, J. E., & Putnam, F. W. (2009). Childhood abuse, avatar choices, and other risk factors associated with internet-initiated victimization of adolescent girls. *Pediatrics*, 123(6), 1078–1083. <https://doi.org/10.1542/peds.2008-2983>
- Obokata, A., & Muto, T. (2006a). Chugakusei no hikoukeikoukou ni senkouyouin: 1 gakki to 2 gakki no judanchousa kara [Antecedent factors of junior high school students' mild delinquency: Longitudinal study from the first through the second school term]. *Japanese Journal of Psychology*, 77(5), 424–432. <https://doi.org/10.4992/jjpsy.77.424>
- Obokata, A., & Muto, T. (2006b). Chugakusei no hikoukeikoukou ni yokutsukeikou ni tsuite stressor to coping karano kentou [The relationship between mild delinquency of junior high school students and depression inclination: Examination in terms of stressor and coping]. *Bulletin of the Ochanomizu University Center for Child and Adolescent Development and Education*, 3, 65–73
- Obokata, A., & Muto, T. (2007). Deaikai site nado wo riyou shiteiru chugakusei no tokuchou: Jyurai kara mirareru hikoukeikoukou tononohikaku [Regulative factors of accessing meet-a-mate sites by junior high school students: Comparison with conventional mild delinquency]. *Japanese Journal of Crime Psychology*, 45(2), 61–73. https://doi.org/10.20754/jjcp.45.2_61
- Özbay, Ö. (2005). The factors leading to juvenile delinquency: School, family, district and substance use (Case of Ankara). *Sosyoloji Araştırmaları Dergisi*, 8(1), 115–144
- Park, S. (2009). The association between Internet use and depressive symptoms among South Korean adolescents. *Journal for Specialists in Pediatric Nursing: JSPN*, 14(4), 230–238. <https://doi.org/10.1111/j.1744-6155.2009.00191.x>
- Park, S., Hong, K. E., Park, E. J., Ha, K. S., & Yoo, H. J. (2013). The association between problematic internet use and depression, suicidal ideation and bipolar disorder symptoms in Korean adolescents. *The Australian and New Zealand Journal of Psychiatry*, 47(2), 153–159. <https://doi.org/10.1177/0004867412463613>
- Perry, D. G., & Pauletti, R. E. (2011). Gender and adolescent development. *Journal of Research on Adolescence*, 21(1), 61–74. <https://doi.org/10.1111/j.1532-7795.2010.00715.x>
- Peter, J., Valkenburg, P. M., & Schouten, A. P. (2006). Characteristics and motives of adolescents talking with strangers on the internet. *Cyberpsychology & Behavior: the impact of the Internet multi-media and virtual reality on behavior and society*, 9(5), 526–530. <https://doi.org/10.1089/cpb.2006.9.526>
- Pierce, T. (2009). Social anxiety and technology: Face-to-face communication versus technological communication among teens. *Computers in Human Behavior*, 25(6), 1367–1372. <https://doi.org/10.1016/j.chb.2009.06.003>
- Pretorius, C., Chambers, D., & Coyle, D. (2019). Young people's online help-seeking and mental health difficulties: Systematic narrative review. *Journal of medical Internet research*, 21(11), e13873. <https://doi.org/10.2196/13873>
- Radovic, A., Gmelin, T., Stein, B. D., & Miller, E. (2017). Depressed adolescents' positive and negative use of social media. *Journal of adolescence*, 55, 5–15. <https://doi.org/10.1016/j.adolescence.2016.12.002>
- Ragelienė, T. (2016). Links of Adolescents Identity Development and Relationship with Peers: A Systematic Literature Review. *Journal of the Canadian Academy of Child and Adolescent Psychiatry = Journal de l'Académie canadienne de psychiatrie de l'enfant et de l'adolescent*, 25(2), 97–105
- Raible-Destan, N., Stulz, N., Hepp, U., Ribeaud, D., Eisner, M., Steinhoff, A., Shanahan, L., Sell, A., & Kupferschmid, S. (2021). Self-rated physical attractiveness and its relation to psychological well-being across adolescence. *European Journal of Developmental Psychology*. <https://doi.org/10.1080/17405629.2021.1931104>
- Rose, A. J., & Asher, S. R. (2017). The social tasks of friendship: Do boys and girls excel in different tasks? *Child Development Perspectives*, 11, 3–8. <https://doi.org/10.1111/cdep.12214C>
- Rudolph, K. D., & Dodson, J. F. (2022). Gender Differences in friendship values: Intensification at adolescence. *The Journal of Early Adolescence*, 42(4), 586–607
- Salerno-Ferraro, A. C., Erentzen, C., & Schuller, R. A. (2021). Young women's experiences with technology-facilitated sexual violence from male strangers. *Journal of interpersonal violence*, 8862605211030018. Advance online publication. <https://doi.org/10.1177/08862605211030018>
- Sandstrom, G. M., & Boothby, E. J. (2021). Why do people avoid talking to strangers? A mini meta-analysis of predicted fears and actual experiences talking to a stranger. *Self and Identity*, 20(1), 47–71. <https://doi.org/10.1080/15298868.2020.1816568>
- Savoia, E., Harriman, N. W., Su, M., Cote, T., & Shortland, N. (2021). Adolescents' exposure to online risks: Gender disparities and vulnerabilities related to online behaviors. *International journal of environmental research and public health*, 18(11), 5786. <https://doi.org/10.3390/ijerph18115786>
- Segrin, C. (2000). Social skills deficits associated with depression. *Clinical psychology review*, 20(3), 379–403. [https://doi.org/10.1016/s0272-7358\(98\)00104-4](https://doi.org/10.1016/s0272-7358(98)00104-4)
- Smahel, D., Machackova, H., Mascheroni, G., Dedkova, L., Staksrud, E., Ólafsson, K., Livingstone, S., & Hasebrink, U. (2020). EU Kids Online 2020: Survey results from 19 countries. *EU Kids Online*. <https://doi.org/10.21953/lse.47fdeqj01ofo>
- Statista. (2021). Internet usage rate Japan 2020, by age group. Retrieved Sep 9, 2021, from <https://www.statista.com/statistics/759869/japan-internet-penetration-by-age-group/>
- Stockdale, L. A., & Coyne, S. M. (2020). Bored and online: Reasons for using social media, problematic social networking site use, and behavioral outcomes across the transition from adolescence

- to emerging adulthood. *Journal of adolescence*, 79, 173–183. <https://doi.org/10.1016/j.adolescence.2020.01.010>
- Stoilova, M., Livingstone, S., & Khazbak, R. (2021). Investigating risks and opportunities for children in a digital world: A rapid review of the evidence on children's internet use and outcomes, *Innocenti Discussion Papers* no. 2021-01
- Subrahmanyam, K., & Greenfield, P. (2008). Online communication and adolescent relationships. *The Future of children*, 18(1), 119–146. <https://doi.org/10.1353/foc.0.0006>
- Svensson, R. (2003). Gender differences in adolescent drug use. The impact of parental monitoring and peer deviance. *Youth & Society*, 34(3), 300–329. <https://doi.org/10.1177/0044118X02250095>
- Szwedo, D. E., Mikami, A. Y., & Allen, J. P. (2012). Social networking site use predicts changes in young adults' psychological adjustment. *Journal of Research on Adolescence*, 22(3), 453–466. <https://doi.org/10.1111/j.1532-7795.2012.00788.x>
- Trucco, D., & Palma, A. (2020). Childhood and adolescence in the digital age. A comparative report of the Kids Online surveys on Brazil, Chile, Costa Rica and Uruguay. *Project Documents (LC/TS.2020/18.REV.1)*, Santiago. Economic Commission for Latin America and the Caribbean (ECLAC)
- Valkenburg, P. M., & Peter, J. (2011). Online communication among adolescents: an integrated model of its attraction, opportunities, and risks. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, 48(2), 121–127. <https://doi.org/10.1016/j.jadohealth.2010.08.020>
- Vazsonyi, A. T., Mikuška, J., & Kelley, E. L. (2017). It's time: A meta-analysis on the self-control- deviance link. *Journal of Criminal Justice*, 48, 48–63. <https://doi.org/10.1016/j.jcrimjus.2016.10.001>
- Wolak, J., Finkelhor, D., & Mitchell, K. (2004). Internet-initiated sex crimes against minors: implications for prevention based on findings from a national study. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, 35(5), 424e11–424424. <https://doi.org/10.1016/j.jadohealth.2004.05.006>
- Wolak, J., Finkelhor, D., Mitchell, K. J., & Ybarra, M. L. (2008). Online “predators” and their victims: Myths, realities, and implications for prevention and treatment. *American Psychologist*, 63(2), 111–128. <https://doi.org/10.1037/0003-066X.63.2.11>
- Wurtele, S. K., & Kenny, M. C. (2010). Preventing online sexual victimization of youth. *The Journal of Behavior Analysis of Offender and Victim Treatment and Prevention*, 2(1), 63–73. <https://doi.org/10.1037/h0100468>
- Ybarra, M. L., Alexander, C., & Mitchell, K. J. (2005). Depressive symptomatology, youth Internet use, and online interactions: A national survey. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, 36(1), 9–18. <https://doi.org/10.1016/j.jadohealth.2003.10.012>
- Ybarra, M. L., Diener-West, M., & Leaf, P. J. (2007). Examining the overlap in internet harassment and school bullying: implications for school intervention. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, 41(6 Suppl 1), S42–S50. <https://doi.org/10.1016/j.jadohealth.2007.09.004>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.