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ORIGINAL PAPER

Adolescent and Parent Reports of Aggression and Victimization on Social Media: Associations With Psychosocial Adjustment

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Abstract

Objective This study investigated the relations of adolescent and parent reports of adolescents' aggression and victimization on social media with self-perception (e.g., self-esteem, narcissism) and psychosocial adjustment (e.g., attention problems, conduct problems, anxiety, depression).

Method The sample consisted of 428 participants (214 parent–adolescent dyads) from the United States, with adolescents ranging from 14 to 17 years of age.

Results The majority of adolescents and parents reported that the adolescents had not engaged in social media aggression or experienced victimization; however, nearly one-third of parents reported that they were "unsure." Those involved in such online interactions tended to demonstrate a variety of psychosocial difficulties. Specifically, parent- and adolescent-reported aggression were associated with parent-reported inattention, oppositional defiant disorder (ODD) symptoms, anxiety and depressive symptoms, as well as adolescent-reported narcissism, loneliness, fear of missing out (FoMO), and lower self-esteem. Adolescent-reported victimization was associated with many parent-reported indicators of adjustment as well as adolescent-reported loneliness, FoMO, and lower self-esteem.

Conclusions Social media aggression and victimization were related to a variety of indicators of adolescent self-perception and adjustment. Importantly, adolescents who reported experiencing social media aggression and victimization tended to be viewed by their parents as more maladjusted. Implications for further research on the developmental trajectories of these relations are discussed.

Keywords Social media · Aggression · Victimization · Adolescence · Psychosocial adjustment

Perpetrating and being victimized by online aggression (i.e., comments/posts intended to harm another person) have garnered much popular press and empirical attention, particularly insofar as they presumably cause, and are caused by, problematic functioning in other domains (e.g., behavioral problems, mood disorder symptoms, interpersonal difficulties). For example, in a comprehensive review of 36 published studies involving 12–18 year-olds, the overall prevalence of cyberbullying, a form of online aggression, was 23.0% with the reviewed studies demonstrating associations between cyberbullying/cybervictimization and various indicators of adjustment in youth (Hamm et al. 2015). Thus, further investigation of the mental health and self-perception correlates of online aggression and victimization helps address a present-day concern for the health and social development of youth. Social media may entail a unique context for aggression/victimization by offering easy opportunities to interact with others, even anonymously, which may be particularly appealing to adolescents (Underwood and Ehrenreich 2017). Higher social media activity (i.e., more frequent use of social media, more time spent on social media) is related to a higher likelihood of online aggression and/or victimization (e.g., Kokkinos et al. 2016; Shin and Ahn 2015).

Much of the work on the mental health correlates of social media use have utilized young adult and adolescent samples but have tended to rely on self-reports (e.g., Coyne et al. 2014; Goodboy and Martin 2015; Oberst et al. 2017). In understanding adolescent social media use, parental perspectives may be worthy of consideration. Even if

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parents are largely unaware of adolescents' online experiences with aggression/victimization, gleaning the extent to which these issues are unknown to parents or are congruent with adolescent reports is an important consideration.

Prior research suggests that online aggression and traditional (i.e., that which occurs face-to-face) aggression or bullying are positively correlated in adolescents and young adults (van Geel et al. 2017) and have similar risk factors and behavioral correlates (Låftman et al. 2013). For example, face-to-face aggression and online aggression tend to be associated with broader conduct problem behaviors among 10–17 year olds (Ybarra and Mitchell 2004, 2007). Perpetration of online aggression is relatively higher among adolescents with attention-deficit/hyperactivity disorder (ADHD)-combined presentation, as well as among adolescents ages 10–18 who have engaged in more traditional bullying behavior (Yen et al. 2014).

Online, like offline, victimization was bidirectionally related to internalizing problems (i.e., depression, anxiety) in 6th-12th graders (e.g., Juvonen and Gross 2008; Wang et al. 2011). It has also been argued that online victimization has a greater impact on a young person than being a victim of face-to-face aggression because of the potential anonymity of online acts (Slonje et al. 2013) and the lack of available bystanders who could intervene (Kowalski et al. 2014). Furthermore, adolescent victims tend to demonstrate more severe depression as well as suicidality relative to adolescents who have not experienced online victimization (Yen et al. 2014). The quality of offline relationships also seems to mimic online relationships, particularly for adolescents with social anxiety (Koo et al. 2015).

Thus, there appear to be parallels between how offline aggression and victimization are related to adjustment and how such experiences online also relate to adolescent adjustment. Specifically, externalizing problems are likely associated with engaging in aggression via social media, whereas victimization would be expected to relate to internalizing problems (e.g., anxiety, depression, loneliness, low self-esteem). However, being the perpetrator or victim of aggression may be associated with both behavioral and emotional maladjustment (Kowalski et al. 2014), as well as with maladaptive self-perception, a relatively novel issue examined in this study.

Self-perception variables, such as narcissism and self-esteem, may also be connected to online aggression or victimization. Specifically, narcissism has shown relations with bullying and aggression in teenagers outside of the online context (e.g., Stellwagen and Kerig 2013), as well as with cyberbullying among undergraduate students (Kokkinos et al. 2016). Narcissism involves a sense of superiority or desire to assert dominance over peers as well as a preoccupation with being seen in a similarly positive light (Raskin et al. 1991). Aggression, including within social media interactions, provides a potential avenue for achieving that dominance. Although Shin and Ahn (2015) point to cyberconfidence (i.e., one's sense of confidence within online interactions) as a factor in online aggression, low self-esteem has also been noted as a consistent correlate of both perpetration of, and victimization from, online aggression (see Kowalski et al. 2014). Taken together, these findings indicate that the valence of one's self-perception may be a factor in aggression experiences on social media. However, additional social, developmental, and motivational factors that have not been investigated concerning aggression/victimization may also be important for social media interactions among adolescents and may help further our understanding of how self-perception connects to such experiences.

For example, emerging research highlights the potential relevance of fear of missing out (FoMO) for adolescent social media activity. In short, FoMO is a tendency to feel distress about the possibility that one is missing out on the positive experiences or activities of others (Przybylski et al. 2013). FoMO may be particularly relevant during adolescence, as there is typically a need to form connections and a sense of belongingness with others at that time (Lansford et al. 2014). Theoretically, social media provide feedback on the extent to which adolescents are achieving this developmental need and could spark or exacerbate feelings of FoMO as well as loneliness. Indeed, higher social media activity (i.e., higher number of accounts) is associated with symptoms of anxiety and depression but only for adolescents relatively high in FoMO or perceived loneliness, and FoMO is also related to higher social media activity (Barry et al. 2017). Therefore, adolescents who experience FoMO may have a greater probability of having engaged in online aggression or experienced victimization, whereas loneliness may be specifically connected to victimization based on its relation to adolescent internalizing problems (e.g., Barry et al. 2017).

The primary aim of this study was to investigate adolescents' reports of aggression and victimization on social media as correlates of parent- and adolescent-reported psychosocial functioning and social media engagement. Both direct and indirect forms of aggression and victimization from adolescent reports were considered in order to assess possible differences between aggression experiences that are directly communicated to others versus those that target an individual without naming or interacting with the victim. Developmentally, adolescents' need to form meaningful connections with others and the importance of peer affiliations (Lansford et al. 2014) potentially lend further weight to the importance of adverse social media experiences, such as online victimization, in terms of mental health. From the perspective of Coconstruction Theory (Underwood and Ehrenreich 2017), adolescents' online experiences mimic those from their face-to-face

interactions, a connection that has received empirical support (see Kowalski et al. 2014). This research presents an opportunity to more comprehensively understand the degree to which online aggression and victimization are tied to social media engagement and their potential impact on adolescent psychosocial development, as well as the unique relevance of both parent and adolescent perspectives on these relations. It was hypothesized that parent- and teen-reported experiences with aggression and victimization on social media were expected to be moderately related (Hypothesis 1) based on typical cross-informant agreement on child/adolescent behavior (Frick et al. 2010). This issue was investigated in light of the very limited use of multiple informants in research on adolescent social media experiences. Second, consistent with previous research (e.g., Kokkinos et al. 2016; Shin and Ahn 2015), it was hypothesized that higher engagement with social media (i.e., higher number of accounts, more frequent checking of social media) would be positively associated with parent- and adolescent-reported experiences of social media aggression and victimization. Third, social media aggression from parent and adolescent reports was expected to be positively associated with ADHD, oppositional defiant disorder (ODD), and conduct disorder (CD) symptoms, and with narcissism. In contrast, social media aggression was hypothesized to be negatively correlated with self-esteem consistent with prior research concerning online aggression (see Kowalski et al. 2014). Fourth, adolescents' social media victimization was hypothesized to be negatively related to self-esteem and positively correlated with anxiety, depression, and loneliness based on literature previously demonstrating similar relations for online victimization (e.g., Juvonen and Gross 2008; Wang et al. 2011). Lastly, FoMO was expected to be related to social media aggression and victimization, as FoMO appears to represent a motivation to engage in more interactions via social media thus increasing the probability of aggression and victimization on social media.

Method

Participants

The sample consisted of 428 participants (i.e., 214 adolescent–parent dyads who provided complete survey data) from throughout the United States. Participants were recruited through an online platform which contacts individuals who have expressed interest in completing questionnaires for research purposes (see below for further description). Adolescents ranged in age from 14 to 17 ($M =$ 15.50 years, *SD* 1.07). The sample of adolescents was approximately evenly split by gender (i.e., 48.6% male, 47.7% female, 3.7% reporting "other" or declining to respond). Gender of parent informants was predominantly female (i.e., 34.7% male, 65.3% female). In terms of adolescents' racial/ethnic background, 77.7% participants identified as White/Caucasian, 7.0% identified as Black/African-American, 3.7% identified as Asian, 4.2% as Hispanic, 1.4% as Native American/American Indian, 5.1% as Multi-racial, and 1.4% as "Other." The median annual household income as reported by parents was $62,500, which is slightly above the $56,000 U.S. median annual family income most recently reported by the U.S Census Bureau (U.S. Census Bureau, 2015).

Procedure

The Institutional Review Board (IRB) at the authors' affiliated university approved this study prior to data collection. Qualtrics, a company that maintains secure online survey research, contacted prospective parent participants in the United States who showed interest in survey-based research. For this study, parents with adolescents between 14 and17 years of age were contacted and given a secure link to the parent consent form. Consenting parents then completed the parent-report measures and gave their adolescent's e-mail address, which Qualtrics used to contact them separately. The e-mail to potential adolescent participants included a link to the adolescent assent form and the adolescent-report measures. This procedure allowed adolescents to independently and privately consider their participation. Parents received "market points," which have a small cash value, for their participation and that of their adolescent. Only parent–adolescent dyads with complete data were included in analyses. Data for this study were provided by 431 parents, with 214 adolescents providing data (49.7% response rate) and resulting in the final sample of 214 parent–adolescent dyads. Independent samples *t* tests were used to analyze mean differences in parent-rated DSM-5 symptoms for adolescents who provided data versus those who did not. Adolescents who did not provide data were rated higher by parents on all DSM-5 domains assessed (i.e., inattention, hyperactivity, ODD symptoms, CD symptoms, anxiety symptoms, depressive symptoms).

Measures

Social Media Survey—Adolescent Version Adolescents completed a survey that asked questions about (a) their social media use (e.g., how many social media accounts they have; their frequency of checking their social media accounts); and (b) their experience with aggression and victimization on social media (Barry et al. 2017). Single

items were used to assess each of the following variables. Specifically, frequency of overall social media use/checking was assessed using an 8-point scale from *never* to *more than 10 times a day*. For number of accounts, responses were on a 5-point scale from *0* to *more than 7*. Questions regarding aggression and victimization were in a dichotomous (i.e., *yes/no*) format asking adolescents whether they had ever (directly or indirectly in two separate items) posted anything negative about other people and ever had anything negative (directly or indirectly in two separate items) posted about them. Response frequencies for items on this survey are shown in Table 1.

Narcissistic Personality Inventory for Children (NPIC) The NPIC consists of 40 items for assessing self-reported narcissism in children and adolescents (Barry et al. 2003). The item content was derived from the Narcissistic Personality Inventory (NPI; Raskin and Terry, 1988) that has been used extensively with adults. Each item consists of 2 statements (e.g., "I like to be the center of attention" vs. "I try to blend in with other people around me") and asks participants to select which of the statements is most like them. For the chosen statement, they then indicate whether it is *"sort of true"* or *"really true"* of them, resulting in a 4-point response scale for each item. The internal consistency of total NPIC scores was $\alpha = 0.88$.

Rosenberg Self-esteem Scale (RSES) The RSES is a widely used 10-item self-report measure of self-esteem (Rosenberg, 1965). Participants responded to items (e.g., "I feel that I have a number of good qualities") on a 4-point scale from *strongly disagree* to *strongly agree*. In the present study, the internal consistency of RSES scores was $\alpha = .90$.

Fear of Missing Out Survey (FoMOS) The FoMOS consists of 10 items (e.g., "I get worried when I find out my friends are having fun without me") that assess preoccupation with missing events, including on social media, within one's social circle (Przybylski et al. 2013). Reponses are made on a 5-point scale from *not at all true of me* to *extremely true of me* with ratings summed to form the FoMO score. In the present study, the internal consistency of FoMO scores was $\alpha = 0.91$.

UCLA Loneliness Scale, Third Edition (UCLA-3) Adolescents' subjective loneliness (e.g., "How often do you feel isolated from others?") was assessed via the 20-item UCLA-3 (Russell 1996). Responses are made on a 4-point scale from *Never* to *Often* and summed. In the present study, the internal consistency of the UCLA-3 was $\alpha = 0.94$.

Social Media Survey—Parent Version Parents completed a similar survey that assessed their perceptions of their child's social media use, as well as their awareness of whether their child has been the perpetrator and/or victim of direct aggression on social media (Barry et al. 2017). The same response scales were used for the adolescent and parent versions of the survey with parents also being given the option to respond *"Not Sure"* for the aggression and victimization items. Response frequencies for parent-report items are also shown in Table 1.

DSM Checklist Parents reported on their adolescent's symptoms of attention-deficit/hyperactivity disorder

Table 1 Response frequencies for social media use items

	% Yes		% No		% Unsure-parent		
Social media direct aggression							
Parent report	27.1		40.2		32.7		
Adolescent report	22.4		77.6				
Social media direct victimization							
Parent report	27.6		40.2		32.2		
Adolescent report	32.7		67.3				
Social media indirect aggression							
Adolescent report	23.4		76.6				
Social media indirect victimization							
Adolescent report	31.3		68.7				
# of social media accounts	None		1–3		4–5	6–7	>7
Parent report[a]	4.7		60.3		31.8	1.9	1.4
Adolescent report[a]	4.2		55.6		34.6	3.7	1.9
Frequency of checking accounts	Never	<1/wk	2–5/wk	1/day	2–5/day	>5/day	>10/day
Adolescent report	7.0	6.5	12.1	33.6	20.6	16.4	3.7

Note: Numbers reported are percentage of respondents

[a]Responses were made on a 1–5 scale (from "*none*" to "*more than 7*")

(ADHD; with symptoms of inattention and hyperactivity/impulsivity, 6 items each, analyzed separately), oppositional defiant disorder (ODD; 8 items), conduct disorder (CD; 15 items), anxiety (16 items), and depression (8 items) on a checklist based directly on DSM-5 criteria (American Psychiatric Association, 2013). For ADHD, ODD, depression, and anxiety, a 4-point response scale (i.e., *Never* to *Very Often*) was used. CD symptoms were assessed dichotomously (i.e., *yes* or *no*) according to whether the teen had ever engaged in the behavior, based on how CD symptoms are framed in *DSM-5* criteria. Ratings were summed to form each of these variables. Internal consistencies ranged from $\alpha = .91$ (hyperactivity) to $\alpha = 0.96$ (CD symptoms). CD symptoms were not significantly related to the other symptom scales. Otherwise, the scales were significantly interrelated ($r = 0.39$–0.88).

Data Analyses

Descriptive statistics demonstrated the reported frequency of social media aggression and victimization for this sample. The hypotheses described above were initially tested through bivariate correlations to determine the a) parent–adolescent convergence on experiences of social media aggression and victimization; and b) the relations of these reports with indicators of adolescent self-perception and parent-reported mental health. More specifically, phi and point biserial correlational analyses were conducted for dichotomous reports of aggression and victimization on social media (coded as $0 = no$, $1 = yes$). Mean-level analyses were used to determine if parents or adolescents significantly reported more experiences for the adolescents with social media aggression or victimization. *Post hoc* multiple regression analyses were conducted to determine the unique contributions of the mental health and self-perception variables investigated on adolescent-reported aggression and victimization. The focus of these analyses was adolescent-reported aggression and victimization because it was believed that they would be more aware of their experiences than parents, yet we wanted to consider relations with adjustment from a cross-informant perspective and utilized parent-reported mental health symptoms to accomplish this aim.

Results

Prevalence of Social Media Aggression and Victimization

Descriptive statistics concerning experiences of social media aggression, victimization, and engagement are displayed in Table 1. As shown in Table 1, roughly one-fourth of adolescents reported having engaged in social media aggression either directly or indirectly, whereas approximately one-third of adolescents in the sample reported having been victims of such aggression. Nearly one-third of parents reported being unsure if their teen had engaged in, or been victimized by, aggression on social media. Adolescent participants reported regular engagement with social media, in that 74.3% of participants reported checking social media at least once per day. We also examined the degree of overlap between reports of aggression and victimization. Specifically, of the 58 parents who reported that their adolescent had engaged in aggression on social media, 41 (70.7%) reported that their adolescent had also been victimized. Of the 59 parents who reported that their adolescent had been victimized, 41 (69.5%) also reported that their adolescent had been aggressive toward others on social media. For adolescents, 36 of the 48 (75%) of those who reported having directly aggressed against others on social media reported also having been directly victimized. Of the 70 adolescents who reported having been directly victimized, 36 (51.4%) reported having also aggressed against someone directly.

For parent-reported indicators of adjustment, symptoms of CD and anxiety were significantly positively skewed (i.e., 2.70 and 2.03, respectively), indicating that most youth in this sample were rated as having relatively few such difficulties. The data for these variables were not transformed due to the somewhat low level of positive skew and because positive skew would be expected for such clinical constructs (Frick et al. 2010). That is, to transform those variables would alter the extent to the sample distributions map onto the distributions of those underlying constructs.

Relations of Social Media Aggression and Victimization with Self-Perception and Psychosocial Adjustment

Based on the correlations shown in Table 2, adolescents and parents did not show a high level of convergence in their reports of these experiences. Specifically, parent and teen reports of aggression and victimization were significantly, but weakly, interrelated, $r = 0.24$, $p = 0.003$, and $r = 0.19$, $p = 0.02$, respectively. Adolescents were significantly less likely to endorse social media aggression ($M = 0.22$, $SD = 0.42$) than were their parents ($M = 0.40$, $SD = 0.49$), $t(143) = 3.85$, $p < 0.001$; however, these differences reflect only data for parents who did not respond "*Not sure*" to that item. That is, parents who reported knowledge of their child's social media aggression were more likely to report a history of such incidents than were their children. Regarding victimization, the difference between adolescent ($M = 0.33$, $SD = 0.47$) and parent ($M = 0.41$, $SD = 0.49$) reports was not significant, $t(144) = 1.49$, $p = 0.14$. The within

Table 2 Correlations between parent and adolescent reports of social media aggression and victimization

	1.	2.	3.	4.	5.	6.
1. Aggression (parent report)	–	0.72***	0.24**	0.20*	0.09	0.12
2. Victimization (parent report)		–	0.14	0.19*	0.04	0.16
3. Aggression (adolescent report)			–	0.49***	0.47***	0.46***
4. Victimization (adolescent report)				–	0.49***	0.75***
5. Indirect aggression (adolescent report)					–	0.60***
6. Indirect victimization (adolescent report)						–

Note: Responses were coded 1 = *no*, 2 = *yes*; The statistical power for analyses involving parent report of aggression or victimization was lower due to parents who responded "don't know" to those questions. Such responses were coded as missing for these analyses

Table 3 Correlations of social media aggression and victimization with social media engagement

	Aggression parent report/ adolescent report	Victimization parent report/ adolescent report	Indirect aggression adolescent report	Indirect victimization adolescent report
# of accounts (parent report)	0.07/**0.26*****	0.12/**0.22****	**0.27*****	**0.28*****
# of accounts (adolescent report)	0.12/**0.31*****	0.09/**0.23****	**0.24****	**0.28*****
Frequency of checking social media (adolescent report)	−0.05/**0.25*****	0.03/**0.24****	**0.18****	**0.23****

Note: Correlations involving adolescent-reported aggression/victimization are in **bold**. Analyses for parent-reported aggression/victimization had lower power based on parents who responded "unsure" which was treated as missing data

informant agreement on aggression and victimization was higher for parents than for adolescents, *Fisher's z'* = 2.76, $p = 0.005$. Of note, parents and teens did demonstrate high convergence on their reports of the number of social media accounts that the teens had, $r = 0.82$, $p < 0.001$. Based on independent-samples *t*-tests, male and female adolescents did not differ in their reported history of social media aggression or victimization from either informant. Lastly, adolescents' reports of their own direct and indirect aggression and victimization on social media were moderately interrelated ($r = 0.47$–0.69).

Correlations between social media engagement and experiences of aggression and victimization are displayed in Table 3. Parent-reported social media aggression and victimization were not correlated with any of the indices of social media engagement (i.e., parent-reported number of accounts, adolescent-reported number of accounts, adolescent-reported frequency of checking social media). However, adolescent reports of social media aggression and victimization were significantly positively correlated with all three indicators of social media engagement. These results held for both direct and indirect forms of aggression and victimization but were small to moderate in magnitude (i.e., $r = 0.18$–0.31).

Table 4 displays correlations of parent- and adolescent-reported social media aggression and victimization with psychosocial adjustment. Aggression (from both informants) was significantly correlated with parent-reported attention problems, hyperactivity/impulsivity, and ODD symptoms, as well as adolescent-reported narcissism (for direct social media aggression). In addition, adolescent-reported social media aggression was negatively correlated with self-esteem. Social media aggression was not related to parent-reported CD symptoms. Adolescent-reported social media aggression was also correlated with anxiety and depressive symptoms, as well as loneliness, which were not hypothesized relations. Parent-reported social media aggression was significantly related to depressive symptoms and loneliness. Thus, aggression on social media was connected to internalizing difficulties in addition to expected associations with externalizing problems.

Adolescent-reported direct and indirect victimization were related to anxiety and depressive symptoms, as well as lower self-esteem. These correlations were not apparent for parent-reported victimization. Adolescent-reported loneliness was related to victimization from both informants. Adolescent-reported victimization was associated with parent-reported inattention, hyperactivity, and ODD symptoms. Lastly, FoMO was related to parent-reported aggression, as well as adolescent-reported direct and indirect aggression and victimization.

Unique Variance in Aggression and Victimization Associated with Self-Perception and Adjustment Variables

Follow-up stepwise regression analyses were conducted to determine which predictors, in succession, contributed unique variance to adolescent-reported social media aggression and victimization. Direct and indirect social

Table 4 Correlations of aggression and victimization with indicators of psychosocial functioning and self-perception

	Aggression parent report/adolescent report	Victimization parent report/ adolescent report	Indirect aggression adolescent report	Indirect victimization adolescent report
Inattention	.23**/**.32***	.12/**.17***	**.27***	**.25***
Hyperactivity/ Impulsivity	.19*/**.35***	.15/**.23****	**.27***	**.23****
ODD symptoms	.19*/**.35***	.14/**.33***	**.33***	**.35***
CD symptoms	−.13/−**.07**	−.23**/**.00**	**.02**	−**.01**
Anxiety Symptoms	.13/**.31***	.15/**.30***	**.27***	**.30***
Depressive Symptoms	.21*/**.36***	.13/**.36***	**.33***	**.33***
Loneliness	.21*/**.22****	.20*/**.24***	**.19****	**.28***
FoMO	.17*/**.25***	.16/**.29***	**.27***	**.31***
Self-esteem	−.16/−**.19****	−.15/−**.19****	−**.17***	−**.20****
Total Narcissism	.24**/**.21***	.12/**.12**	**.13**	**.10**

Note: Correlations involving adolescent-reported aggression and victimization are in **bold**, whereas those for parent-reported aggression/victimization are in regular type. Analyses for parent-reported aggression/victimization had lower power based on parents who responded "unsure" which was treated as missing data. *$p < .05$; **$p < .01$; ***$p < .001$

Table 5 Stepwise regression analyses predicting adolescent-reported social media aggression

	Criterion variables	
	Direct aggression[a]	Indirect aggression[b]
Step 1 R^2	0.13***	0.11***
Depressive symptoms	0.36 ***	–
ODD symptoms	–	0.33***
Step 2 R^2	0.17***	0.15***
Depressive symptoms	0.28***	–
ODD symptoms	–	0.29***
# of accounts (adolescent report)	0.22**	–
# of accounts (parent report)	–	0.21**
Step 3 R^2	0.19***	–
Depressive symptoms	0.15	–
# of accounts (adolescent report)	0.22**	–
Hyperactivity/impulsivity	0.20*	–

Note: Standardized effects are shown. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

[a]Excluded variables: inattention, ODD symptoms, anxiety symptoms, FoMO, loneliness, self-esteem, # of accounts (parent report)

[b]Excluded variables: inattention, hyperactivity/impulsivity, depressive symptoms, anxiety symptoms, FoMO, loneliness, self-esteem, # of accounts (adolescent report)

media aggression and victimization were used as criterion variables in separate models. Predictor variables were those that were significantly correlated with each criterion at the bivariate level (see Tables 5 and 6) and were set to be entered in order with a *probability of* $F = .05$. This procedure resulted in a single predictor being added in each subsequent step as long as a significant unique effect was evident for the predictor.

The results of the models for predicting adolescent-reported direct and indirect aggression are reported in Table 5. Depressive symptoms contributed unique variance to direct aggression and were included in each of the three steps of the direct aggression model, with adolescent-reported number of social media accounts, and hyperactivity/impulsivity each being added in subsequent steps, R^2 *final step* $= .19$, $p < 0.001$. For indirect social media aggression, ODD symptoms were a predictor in each step of the two steps of the model, with parent-reported number of accounts being added to the second step, R^2 *final step* $= 0.15$, $p < 0.001$.

Table 6 shows the results of the stepwise models for predicting adolescent-reported direct and indirect victimization. For direct victimization, ODD symptoms were a predictor in each of the four steps, with frequency of checking social media, inattention (inverse effect), and FoMO each being added in order in the subsequent steps, R^2 *final step* $= 0.18$, $p < 0.001$. ODD symptoms were also a predictor in each of the four steps of the indirect victimization model, with parent-reported number of accounts, FoMO, and hyperactivity/impulsivity (inverse effect), being added in order in each of the subsequent steps, R^2 *final step* $= 0.18$, $p < 0.001$.

Discussion

This study extended prior research by examining both mental health and self-perception correlates of aggression and victimization on social media in adolescents and by incorporating parent reports of aggression, victimization, and indicators of mental health (e.g., attention problems, conduct problems, depressive symptoms). The reported

Table 6 Stepwise regression analyses predicting adolescent-reported social media victimization

	Criterion variables	
	Direct victimization[a]	Indirect victimization[b]
Step 1 R^2	0.11***	0.12***
ODD symptoms	0.33***	0.35***
Step 2 R^2	0.15***	***
ODD symptoms	0.31***	0.30***
Frequency of checking (adolescent report)	0.21**	–
# of accounts (parent report)	–	0.22**
Step 3 R^2	0.16***	0.17***
ODD symptoms	0.15	0.24***
Frequency of checking (adolescent report)	0.22**	–
# of accounts (parent report)	–	0.19**
Inattention	−0.22*	–
FoMO	–	0.15*
Step 4 R^2	0.18***	0.18***
ODD symptoms	0.44***	0.39***
Frequency of checking (adolescent report)	0.18**	–
# of accounts (parent report)	–	0.20**
Inattention	−0.26**	–
FoMO	0.17*	0.19**
Hyperactivity/impulsivity	–	−0.22*

Note: Standardized effects are shown. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

[a]Excluded variables: hyperactivity/impulsivity, anxiety symptoms, depressive symptoms, loneliness, self-esteem

[b]Excluded variables: inattention, depressive symptoms, anxiety symptoms, loneliness, self-esteem

prevalence of direct and indirect online aggression in the present sample is consistent with other estimates in adolescents (e.g., Hamm et al. 2015; Shin and Ahn 2015). It was hypothesized that parent and adolescent reports of adolescents' experiences with social media aggression and victimization would be moderately correlated. Further, it was expected that higher social media engagement would be associated with a greater likelihood of reported experiences with social media aggression and victimization. The correlational findings in our sample are especially noteworthy for the following two reasons. First, there was a general lack of convergence between parent and teen reports of experiences with aggression and victimization on social media as well as a relatively high proportion of parents (i.e., roughly one-third of the sample) who indicated that they did not know if their teens had experienced either. Parents exhibited stronger within informant agreement than did adolescents on reports of aggression and victimization. It may be that parents who thought that aggression had (or had not) occurred tended to believe the same regarding victimization, whereas adolescents may have been more aware of their divergent experiences in terms of aggression and/or victimization. This possible relative lack of parental awareness aligns with early evidence in this area (Juvonen and Gross 2008) and indicates that parents may not be particularly good informants of adolescents' social media experiences. It should be noted, however, that parents and adolescents were consistent in their reports of the number of adolescents' social media accounts. Thus, parents may be useful in terms of general awareness of their teens' basic social media engagement but not necessarily of the interactions that occur therein.

Second, the results indicate that adolescent experiences of aggression and victimization are connected to a variety of indicators of maladjustment, even when reports of symptomatology come from a different informant, largely in support of our hypotheses concerning an association between social media aggression and externalizing problems and between victimization and internalizing problems. This pattern also held for indirect forms of online aggression and victimization (e.g., so-called "subtweeting"). That is, teens who acknowledge experiences with such aggression or victimization are viewed by parents, regardless of whether parents are aware of these experiences, as having relatively more behavioral and emotional difficulties. ODD and depressive symptoms were uniquely related, albeit with relatively small effect sizes, to adolescent-reported aggression, with ODD symptoms also being related to victimization. These findings are consistent with a previous review showing a myriad of behavioral and emotional difficulties associated with online aggression or cyberbullying in youth (Kowalski et al. 2014). The present study is the first known study to show such a pattern specific to ODD symptoms. These symptoms may be a marker of antagonism toward others, including peers, that manifests in both aggression/victimization. Peer perceptions of antagonism or constructs similar to ODD may be a worthy avenue of future research.

Notably, there was a small negative association between parent-reported victimization and parent-reported CD symptoms, as well as unique negative effects of inattention and hyperactivity/impulsivity in predicting direct and indirect victimization, respectively. Such findings may indicate that parents who see their children as engaging in relatively severe conduct problem behaviors may also view them as being less likely to be targeted by their peers online. Teens may also be hesitant to target others who have, or are perceived as having, behavioral problems for fear of

retaliation. Similarly, although adolescents rated as being hyperactive/impulsive are more likely to report social media aggression, there may be aspects of these symptoms, as well as of inattention, that are connected to a lower likelihood of reporting victimization. These issues could simply include a lower likelihood of victimization, or alternatively, limited awareness of social cues of victimization for youth with ADHD symptoms (e.g., Hoza 2007). The lack of relation between CD symptoms and social media aggression may be due to the restricted range of CD symptoms in this sample, the more varied behavioral issues encompassed in symptoms of CD, or the possibility that parents' ratings of CD were influenced more by how their adolescents interacted with authority figures than with peers.

Concerning self-perception, narcissism demonstrated small associations with reports of direct social media aggression, but not victimization, from both informants. These findings are consistent with our hypotheses concerning a link between narcissism and social media aggression and with previous research in adults (Goodboy and Martin 2015). In addition, loneliness, FoMO, and lower self-esteem demonstrated small to moderate relations with adolescent reports of aggression and victimization. This connection between FoMO and both aggression and victimization was consistent with our hypothesis. These findings are suggestive of perhaps two possibilities: a) teens with feelings of loneliness, FoMO, or low self-esteem seek out more social media interactions, thus also encountering more negative experiences; or b) online aggression and victimization have a negative effect on teen self-perception. We conceptualized adolescent-reported self-perception variables as risk factors for aggression/victimization; however, a bidirectional influence is possible. Specifically, experiences with aggression or victimization on social media may shape one's self-perception, whereas one's self-perception may also increase the likelihood that he/she will perpetrate aggression or be victimized online.

Lastly, the relatively weak convergence between parent and adolescent reports of social media aggression/victimization and the apparent importance of adolescent reports of their experiences for adjustment reveal a need to improve parent–adolescent communication about social media experiences. As expected, higher adolescent social media engagement was related to a higher likelihood of having experienced social media aggression (as a perpetrator or victim), but this association applied primarily to adolescent-reported aggression and victimization. Parent-reported number of social media accounts was uniquely related to indirect aggression and victimization, perhaps indicating that parents who are aware that their teens are relatively engaged with social media may still have limited knowledge of the social media experiences of their teens. Parental connectedness to adolescents on social media can have protective effects for adolescents (Coyne et al. 2014), but more attention is needed on specific parent–adolescent communication styles regarding social media use and aggression/victimization.

Limitations and Future Directions

Several factors limit the conclusions that can be drawn from the present study. First, the dichotomous approach to assessing social media aggression or victimization limited the variance of responses for these variables and precluded an evaluation of the frequency and perceived severity involved in these experiences. In addition, parental knowledge of indirect aggression and victimization was not obtained due to concerns about how their awareness of more covert, less direct social media behaviors. However, such reports could have been informative. The present multi-informant approach allowed for simplicity and sensitivity in assessment (i.e., capturing any previous negative interactions on social media directed to, or committed by, others). It was also informative in providing information on the proportion of parents who reported being unaware of their teens' experiences with direct aggression or victimization. Still, more expansive methods, including adolescent reports of mental health variables, parent reports of indirect aggression/victimization, and direct observation of social media interactions, are needed.

The recruitment of participants through on-line panels has advantages in terms of efficiency and geographic representativeness, yet the convenience of such samples also presents some self-selection bias as to who would be interested in taking part in research of this nature. Additionally, some adolescents whose parents provided data chose not to participate themselves, and these adolescents were rated higher by parents, on average, on each of the mental health indices assessed, relative to those adolescents who participated. In the present study, the vast majority of participants reported being White/Caucasian, and the reported median annual family income was slightly above that of the U.S. population in general. It is unclear at this point whether these demographics then translate to differences in the amount or type of adolescent social media use. Thus, efforts are needed to recruit a more racially/ethnically diverse sample to better understand the relations investigated in this study. Because of these sampling issues, the present findings may not be a fully accurate reflection of the social media experiences of the more general population of adolescents. The cross-sectional design also prevents conclusions regarding the temporal relations between aggression/victimization, mental health symptoms, and adolescent self-perception. Our analytic approach was to determine the extent to which the adjustment and social media engagement variables could concurrently predict whether

participants had reportedly experienced social media aggression or victimization. However, research has discussed the potential developmental impact of online aggression and victimization on subsequent mental health and self-perception (see Kowalski et al. 2014 for review). That is, it is at least as plausible to consider such aggression and victimization as predictors, rather than outcomes, of adolescent adjustment. This issue should continue to be the subject of longitudinal investigations, particularly in regards to interactions on social media platforms. Lastly, despite efforts to ensure the privacy of adolescents' responses, it is still possible that parents may have monitored their responses and thus potentially influenced what adolescents were willing to report.

Although the multi-informant design was a relative strength of this study, there are very likely additional variables or methods that would provide a more complete picture of the psychological sequelae of aggression and victimization experiences on social media. For example, direct analysis of the content of adolescents' social media interactions (e.g., Ehrenreich and Underwood 2016) in relation to the variables assessed in this study (e.g., FoMO, loneliness, symptoms of depression) is needed. Although the majority of participants in this sample reported not having perpetrated or being subjected to aggression on social media, those involved in such online interactions tended to also demonstrate a variety of psychosocial difficulties. One issue that remains unclear is how experiences of online aggression and victimization impact subsequent social development and social media use. Further efforts should also determine the intervention implications of this work, given the consistent relations of online aggression and victimization with indicators of youth maladjustment. For example, promotion of opportunities for positive offline social interactions with peers may reduce the importance and negative impact of online relationships (Koo et al. 2015). Understanding the interpersonal impact of social media appears especially important as variables such as FoMO take on increasing importance during adolescence (Barry et al. 2017).

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in this study were approved by the Institutional Review Board at Washington State University. All procedures were also conducted in accordance with APA Ethical Standards and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent All parents provided informed consent for their participation and permission for their adolescents to be contacted about the study. All adolescent participants provided voluntary assent for their participation.

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