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Social Media Use, Friendship Quality, and the Moderating Role of Anxiety in Adolescents with Autism Spectrum Disorder

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Abstract

Social media holds promise as a technology to facilitate social engagement, but may displace social activities. Adolescents with ASD are well suited capitalize on the unique features of social media, requires less decoding of complex social information. this cross-sectional study, we assessed social media anxiety and friendship quality in 44 adolescents with and 56 clinical comparison controls. Social media use significantly associated with high friendship quality in adolescents with ASD, which was moderated by the adolescents' anxiety levels. No associations were founds between social media use, anxiety and friendship quality in the controls. Social media may be a way for adolescents with without significant anxiety to improve the quality of friendships.

Keywords

Social media; Anxiety; Friendship quality

Introduction

Adolescents with autism spectrum disorder (ASD) experience difficulties with social interaction and have friends than their peers without ASD (Rowley et al.2012) Improving the capacity for social engagement in youths is a critical intervention target (Laugeson and Ellingsen 2014). The internet and online social media may ways for adolescents with ASD to significantly expand their opportunities for social engagement, through platforms that may be better suited to these youths' unique communicative style—with more structured rules of engagement, and less reliance on non-verbal information such as interpreting facial

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Author Contribution GS conceived of the study, participated in data collection and analysis, and wrote the manuscript. CM led the data analysis and writing of the results section. MO led the data gathering and data entry. MR was involved in recruitment, data gathering and reviewing the manuscript. ZQ was involved in recruitment, data gathering, and design of the study. JM was involved in the design of the study, recruitment, and reviewing the manuscript. EL was involved in designing the study, supervising the statistical analysis, and reviewing the manuscript. FV participated in conceiving the study, supervised the data gathering, and reviewed the manuscript. WS was involved in the design of the study, reviewing of data analysis, and planning and reviewing of the manuscript. All authors approved the final version of the manuscript.

Conflict of interest All authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

expressions (Burke et al. 2010). However, concerns have been raised about such platforms, including the potential for cyberbullying (Kowalski and Limber 2007; Smith et al. 2008), risk of exposure to inappropriate content, and that they offer less meaningful interaction than face to face engagement (Cummings et al. 2002).

Adolescence is an important developmental period during which to understand the impact of social media use given its importance in this age group, as well as the significant social vulnerabilities that characterize this period, particularly for adolescents with ASD (Orsmond et al. 2004). Research in typically developing youth has examined the impact of the internet and online social media use on a range of outcomes, including quality of peer relationships (Subrahmanyam and Greenfield 2008; Valkenburg and Peter 2007). Findings suggest that for some youth, internet use displaces other types of communication, which may in fact be more qualitatively rich, leading to a net negative effect on friendship quality—this has been described as the displacement hypothesis (Cummings et al. 2002). By contrast, other studies have found the internet serves to supplement offline communication, increasing the overall time spent in contact with others (Wellman et al. 2001), and facilitates bridging of online engagement to new offline social experiences (Ellison et al. 2007). This has been described as the increase hypothesis (Lee 2009).

It has been argued that both of these hypotheses may be applicable, but whether internet and online social media use is associated with either displacement or increase of social relationships varies depending on the nature of the platform being used, and aspects of the user themselves (Caplan 2007; Sheeks and Birchmeier 2007; Valkenburg and Peter 2007, 2009). It has therefore been suggested that research is needed that focuses on which factors (including features of the platform and user) may be associated with positive outcomes from internet and social media use (Caplan 2007; Sheeks and Birchmeier 2007; Valkenburg and Peter 2009). In our study, our focus was on the social media platform of Facebook. We considered it to be likely that the increase hypothesis would apply in the case of Facebook use by adolescents with ASD, because of the relatively structured nature of the interactions, which also contain minimal, or are completely void of, complex information such as facial expressions and non-verbal cues. For example, posting on the Facebook wall allows the user to communicate a complete message without having to assess how it is being perceived by other individuals (Van Schalkwyk et al. 2015). Similarly, chat functions on Facebook rely almost exclusively on written content. In addition, adolescents with ASD have fewer offline interactions than their peers, perhaps reducing the likelihood that Facebook usage will displace richer, offline social interactions. Taken together, it is plausible that Facebook is a platform which may be well suited to facilitating social engagement in adolescents with ASD—thus consistent with the increase hypothesis.

Although authors have highlighted the importance of this research area as it applies to individuals with ASD (Burke et al. 2010), there has been little systematic study. Some initial work reported patterns of social media use amongst adolescents with ASD participating in the National Longitudinal Transition Study-2, and found significantly lower rates of social media use compared with other disability groups (Mazurek et al. 2012). Beyond this initial work, a single cross-sectional study examined the patterns and social-emotional correlates of social media use in adults with ASD (Mazurek 2013). This study (N = 108, mean age = 32.4)

years) found 79.6% of these participants used social media, and these adults were more likely to have close friends and higher closeness of relationships than adults with autism who did not use social media (Mazurek 2013). Mazurek et al. also measured the adults' loneliness in the sample and found no significant associations with social media use. To our knowledge, no studies have examined correlates of social media use in adolescents with ASD.

There is also interest in understanding the role of anxiety on the correlates of adolescent social media use (Valkenburg and Peter 2007). Anxiety is a prominent symptom in ASD, and prior research shows that high levels of anxiety are correlated with problematic internet use - a construct which includes behavior such as failing to meet offline obligations because of online engagement (Caplan 2007). In a qualitative study of adolescents without ASD, anxiety in the course of social media use was a prominent aspect of their online experience, and this anxiety took many forms, including concerns about negative peer evaluation, and missing out on opportunities for engagement when not online (Van Schalkwyk et al. 2015). Anxiety may be framed as a potential moderator of the increase hypothesis—specifically, some have argued that more socially anxious youth will be less likely to derive benefit from online social engagement than their more confident peers (Kraut et al. 2002). These findings highlight the need for further work to advance understanding of the impact of anxiety on the social media experience.

In this study, we identified patterns of social media use, friendship quality, and level of anxiety in adolescents with ASD and in a comparison control clinical sample of adolescents without ASD. We hypothesized (1) that social media use would be positively related to friendship quality in ASD, consistent with the increase hypothesis. We considered the increase hypothesis to be more likely than the displacement hypothesis given the ways in which social networking platforms may capitalize on the communicative strengths of youth with ASD. We further hypothesized (2) that this relationship would not be present for youth without ASD, whom we predicted would show a pattern more consistent with the displacement hypothesis. Finally, we hypothesized (3) that, in the ASD group, the relationship between social media use and friendship quality would be moderated by anxiety levels, such that this relationship would be reduced or absent in those with high anxiety. Whereas prior research has focused on the correlates of time spent on social media, in our study we also assessed the social media experience in greater detail. Given the absence of available measures, we developed a set of questions that aim to capture this experience (see below under "Social Media Experience Scale").

A more complete understanding of the social correlates of social media use in individuals with ASD may facilitate advising individuals and families about the impacts of social media use, how it can be best used for positive gains, what potential risks may social media use may pose, and how these risks can be mitigated.

Method

Participants

Participants were 100 youth (ages 12–19 years; Mean age 15 years, SD = 1.9). Of the 100 participants, 44 youth were diagnosed with ASD and were recruited from programs at the Yale Child Study Center. Recruitment involved approaching individuals currently participating in studies or receiving clinical treatment at the Yale Child Study Center and providing them information about the study and an offer to participate. All participants had normal intellectual function, were currently enrolled in school, and lived with their parents/ guardians who also completed measures for the study. Cognitive ability was measured using the Differential Ability Scale, 2nd Edition (DAS-II) (Elliot et al. 1990). All participants had a DAS-II General Conceptual Ability score greater than 70. ASD diagnosis in each case had been established using the Autism Diagnostic Observational Schedule (Lord et al. 2012) or Autism Diagnostic Interview—Revised (Lord et al. 1994) and multidisciplinary clinical evaluation. The remaining 56 participants were youth without ASD recruited from clinical settings at the Yale Child Study Center (See Table 1 for further demographic information). These youth had diverse psychiatric symptoms, but were established to not have symptoms of ASD through psychiatric interview. Anxiety symptoms in the control sample were assessed dimensionally in the study and our aim was to recruit individuals with a broad range of anxiety symptom severity.

Procedure

The study was approved by the university's Human Subjects Committee. Prior to participation, parents of the adolescents under the age of 18 provided signed informed consent, and the adolescent provided informed assent. Participants over the age of 18 provided signed informed consent. Within a cross-sectional design, the study involved administration of rating scales to the adolescents in both groups as well as their parents. Data on time spent using social media also were obtained from the adolescent and demographic information from the parent.

Data were collected at one time point using adolescent and parent completed rating scales, with a subsample (n = 24) also providing data on their social media use 1 week later. All participants completed the assessment in the presence of either the primary investigator or a research assistant and received \$25 compensation.

Measures

The Friendship Questionnaire—Friendship quality was assessed using both parent and child versions of *The Friendship Questionnaire* (Bierman and McCauley 1987). Each version includes a subscale for positive interactions and a subscale for negative interactions, and consists of 36 items. The positive interactions subscale (FQ+) was used in the analysis for the current study and includes items like "*Is there someone you sit with at lunch? How often?*", with participants asked to rate how often this occurs on a Likert scale from 1 (never) to 5 (always).

Multidimensional Anxiety Scale for Children 2nd edition—Levels of anxiety symptoms were measures using the 50 item parent and child version of the *Multidimensional Anxiety Scale for Children 2nd ed.* (March et al. 1997), a measure also previously employed in studies of individuals with ASD (Wood et al. 2009). This scale includes items like "My child feels tense or uptight" on the parent version, and "I worry about other people laughing at me" on the child version; in each case, participants are asked to rate how often the statement is true on a Likert scale from 0 (never) to 3 (often).

Social Media Experience Scale—Social media experience was assessed using a measure we developed for this study, the Social Media Experience Scale (SMES). This 11-item scale was designed to have two subscales, one which assessed anxiety in the course of social media anxiety (SMES-Anxiety) and a second which asses social media utility (SMES-Utility). Items were derived from a prior qualitative study of the social media experience in a clinical population (Van Schalkwyk et al. 2015). The items are listed in Table 2. The SMES-Utility subscale was chosen to measure active engagement on social media, rather than measurement of time spent which could also represent passive observation of social media platforms.

Data Analysis

A preliminary analysis of the primary hypothesis was addressed by assessing for outliers, normality, and missing data, and computing means, standard deviations and correlation coefficients. To examine the moderating role of youth anxiety on the relation between social media use and friendship quality, a multiple regression analysis using product terms was conducted (Jaccard and Turrisi 2003). The first analysis used the parent report of the FQ+ to assess friendship quality, parent rated MASC-2 (total score) to assess youth anxiety, and youth rated social media using the SMES-Utility subscale. A second set of analysis was repeated using child measures of friendship quality and anxiety and total time spent using social media. Of interest was whether the relation between social media use and friendship quality differed as a function of youth anxiety. All predictors were mean centered for ease of interpretation of regression coefficients (Jaccard et al. 2006). A product term was calculated by multiplying youth anxiety by social media use, and the three predictors (youth anxiety, social media use, anxiety by social media use) were entered into the regression equation simultaneously. Both the ASD and non-ASD sample were initially mean centered, then recentered with the mean anxiety at one standard deviation above and one standard deviation below the initial mean. This allowed us to generate scatter plots to compare the slope of the curve for the relation between social media use and friendship quality when anxiety was high, low and moderate.

Results

Preliminary Analysis

Model-based analyses revealed one outlier. The outlier proved to be inconsequential for the analysis (i.e., all major conclusions remained intact when it was omitted from the analysis). Therefore, results are reported including the outlier. All the variables in the model were checked for non-normality, examining the univariate indices of skewness and kurtosis for

absolute values greater than 2.0. All variables in the model were normally distributed. Missing data were minimal, being less than 5% for any given variable of interest. Table 2 depicts the means and standard deviations of the study variables for the ASD and non-ASD groups. There were significant differences in sex and IEP status between the two samples; these were included in analysis to assess for possible confounding, but were found to be non-significant and thus excluded from the final analysis.

Descriptive Statistics

Characteristics for both samples are described in Table 3. Participants in the ASD sample were significantly less likely to use Facebook. Anxiety scores according to both parent and child ratings were significantly higher in the non-ASD sample (which included youth recruited from an anxiety program) than the ASD sample. Scores for friendship quality according to both parent and child ratings were higher in the non-ASD sample than the ASD sample.

Analysis of Social Media Experience Scale

An exploratory factor analysis (EFA), revealed two factors with eigenvalue greater than 1. This was confirmed visually by scree plot. A two-factor solution was identified using a rotated component matrix, with one factor containing items related to social media anxiety and accounting for 43.8% of the variance, and a second factor containing items related to social media utility accounting for 12.2% of the variance. These factors were consistent with our initial hypothesis of the scale, with the exception of the item "I worry about my replies to people" which was more highly correlated with items in the utility factor. This item was excluded in subsequent analysis. Kaiser-Meyer-Olkin measure of sampling adequacy was 0.849, above the recommended threshold of 0.6, and Bartlett's Test of Sphericity was significant at < 0.01. Total score for the SMES-Anxiety factor was highly correlated with total score on the MASC-2 child in both the ASD (r = .45, p < .01) and non-ASD sample (r = 44, p < 01). There was a high correlation between the total scores at the initial and subsequent assessment (r = 83; p < 01), as well as for the social media utility (r = .78, p = .00) and social media anxiety (r = .71, p < .01) factors.

Correlation Between Social Media Use and Friendship Quality

Correlation matrices were generated for key variables in both the ASD (Table 4) and non-ASD samples (Table 5). In the ASD sample, parent ratings of their child's friendship quality was correlated with both their child's social media utility (r = .35, p < .01) and time spent on social media (r = .36, p < .05). Adolescent ratings of friendship quality was significantly correlated with social media utility only (r = .36, p < .05). These findings were consistent with our primary hypothesis. There were no significant correlations between social media utility and time spent on social media with either parent or child measures of friendship quality in the non-ASD sample.

Regression Analysis

An initial analysis produced a model explaining 24% of the variance on friendship quality (F = 3.7, df = 3, p < .05) in the ASD sample. Table 6 presents the relevant regression

coefficients and associated statistics. The interaction term (social media utility x anxiety) was statistically significant ($\beta = -0.35$, p < .05), suggesting that the relation between social media use and friendship quality was moderated by anxiety. To gain insight into the nature of the interaction, we conducted the regression analysis again when the moderator variable was one standard deviation below the mean and again when one standard deviation above the mean. For adolescents with average anxiety scores, the relation between social media utility and friendship quality was not statistically significant ($\beta = 0.24$, p = .13); when adolescent anxiety was one SD below the mean, the relation between social media use and friendship quality was statistically significant ($\beta = 0.61$, p < .05), and when adolescent anxiety was one SD above the mean, the relation between social media utility and friendship quality was not statistically significant ($\beta = -0.13$, p = .61). Thus, the relation between friendship quality and social media utility was more prominent and achieved statistical significance only in those adolescents with lower anxiety scores (See Fig. 1). Analysis using adolescents self-ratings of anxiety and friendship quality yielded similar findings with a standardized coefficient of 0.32 for social media utility (t = 2.12, p = < 0.05), although the interaction term was non-significant in this case indicating there was not sufficient evidence for the moderating role of adolescent anxiety in this relation.

In the non-ASD sample, regression analysis yielded an overall model that was insignificant and there was no evidence for a relationship between social media use and friendship quality.

Discussion

The results of our study suggest that social media use is associated with better friendship quality in adolescents with ASD (hypothesis 1, and consistent with the increase hypothesis), an association that is not seen in adolescents without ASD (hypothesis 2), and that this association is moderated by anxiety (hypothesis 3). The findings in support of hypothesis 1 were demonstrated using both parent and child reports of friendship quality and including two distinct measures of social media use-total time spent on social media and the total score on the SMES-Utility subscale. Findings as to the moderating role of anxiety were only robustly demonstrated using parent measures of anxiety and friendship quality and when assessing social media use with the broader SMES-Utility subscale. These discrepancies are unsurprising; prior work has indicated poor correlation between parent and child report on the MASC (Baldwin and Dadds 2007), with parent report showing greater stability over 12 months, and youth with ASD in particular may be hypothesized to have distinct perceptions of their anxiety and peer relationships. Although both measures of social media use (time spent and social media utility) were correlated with better friendship quality in youth with ASD, it is unclear why only the relationship between social media utility and friendship quality was significantly moderated by anxiety. One hypothesis is that the measure of social media utility in our study assessed both passive and active forms of engagement on social media— a style of utilization that may be particularly rewarding, but may also expose users to greater risk for negative evaluation by peers. Prior work has highlighted the prevalence and utility of online 'lurking' amongst youth with ASD - a phenomenon of largely passive engagement on social media (Nottingham and User 2008), which may not cause the same type of anxieties which occur in the context of more active forms of engagement.

Our study found no evidence for the increase hypothesis (the relation between social media use and friendship quality) in the non-ASD sample. This is consistent with our initial hypothesis that adolescents with ASD may be a unique subgroup with regards to their capacity to benefit from social media and follow the predictions of the increase hypothesis. In the context of existing theory, our findings suggest that adolescents with ASD may be relatively insulated from the 'displacement' hypothesis (Cummings et al. 2002). Friendship quality in our study was significantly lower for the ASD group than the non-ASD group, and prior literature has highlighted increased loneliness and poorer friendship quality in adolescents with ASD (Bauminger and Kasari 2000).

Our study provides a further perspective on a prominent theoretical debate regarding the validity of two further hypotheses—the 'social compensation' versus 'rich-get-richer' hypotheses (Valkenburg and Peter 2009). The former argues that socially anxious individuals may benefit most from online communication owing to it being in some ways a less stressful platform; the latter hypothesis suggests that socially competent individuals may gain the most by being able to further capitalize on their already well developed offline social networks. In our study, anxiety undermined the utility of social media to be helpful to the ASD group, and yet the unique vulnerabilities of this group allowed them to benefit from the platform. Adolescents with ASD therefore appear to be able to 'socially compensate' through online interaction, but they are compensating for a unique communicative style rather than for being socially anxious.

It is critical that a technology as pervasive as social media be subject to extensive empirical research. The Social Media Experience Scale which we introduce in this paper may be a valuable tool in assessing two key dimensions of social media use—namely, the anxiety which adolescents may experience in the course of using or contemplating social media, and the ways in which it may be considered useful.

We found the scale to have robust psychometric properties, to be acceptable and feasible for use in both an ASD and non-ASD adolescents, and to include a valid measure of social media anxiety which is highly correlated with total scores on the MASC-2. Future research may aim to confirm the proposed factor structure of this scale, and apply it to answering additional key questions regarding social media use in adolescents.

Our study is limited by its cross-sectional nature, which allows us to show only an association between social media use and friendship quality. Longitudinal, prospective or experimental research could verify these findings. Further, despite our efforts at quantifying social media use both in terms of time and experience, these platforms remain heterogeneous, and it is unclear what aspect of social media use may be most related to higher friendship quality.

In conclusion, whatever its overall impact on society, social media platforms have now become pervasive and likely possess significant utility for many adolescents. The prominence of the distinction between the ASD and non-ASD group in our study suggests that an opportunity exists to broaden the opportunities for social engagement for adolescents with ASD through effective use of with social media. Future work may seek to develop

interventions which help adolescents not only spend time on these platforms, but find ways to be effectively and actively engaged. Further, clinicians working with youth who have ASD should carefully for both baseline anxiety, and anxiety in the course of social media use, given the demonstrated capacity for high anxiety to undermine the prosocial utility of social media use [as demonstrated by our findings and in previous work (Caplan 2007)]. The SMES is a promising instrument for assessing social media anxiety in clinical settings, and identifying targets for possible intervention.

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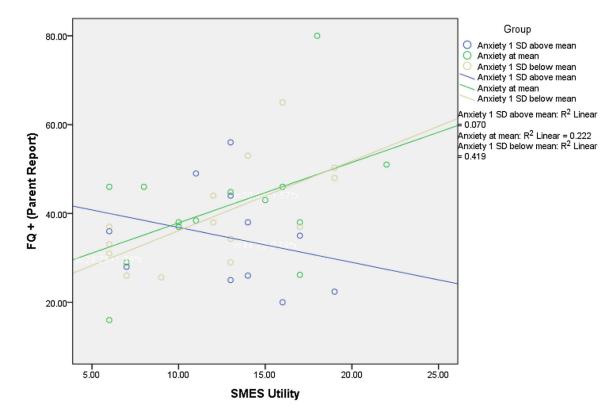


Fig. 1. Plot of SMES-Utility against FQ+ in ASD sample for different levels of anxiety

Table 1

Demographic information

	ASD (n = 44)	Non-ASD $(n = 56)$
Mean age (years)	14.86 (SD = 2.04)	15.11 (SD = 1.73)
Sex		
Male	31 (70.5%)*	20 (35.7%)
Female	12 (27.3%)	35 (62.5%)
IEP		
Yes	34 (77.3%)*	13 (23.2%)
No	8 (18.2%)	31 (55.4%)
504 Plan		
Yes	5 (11.4%)	11 (19.6%)
No	33 (75.0%)	33 (58.9%)

p < .05 using Fisher's exact test

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Table 2

Items on the Social Media Experience Scale

Social media utility	Social media lets me reach lots of different people for support
	Posting messages is a way to let everyone know how I'm feeling
	Posting is a way to avoid having to ask a specific person I know for help
	I get support by looking over saved chats
	Social media lets me open up about things that are hard to talk about face-to-face
	Having time to think about how I reply to messages or chats is helpful
Social media anxiety	I worry about my replies to people
	It is important for me to be active on social media
	It is important that people like the things I post
	I worry that people will post mean or hurtful things about me
	It bothers me when I see on social media how good others' lives are

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Table 3

Anxiety, social media, and friendship scores in ASD and non-ASD youth

	ASD group	Non-ASD group
Use social media*		
Yes	30 (68.2%)	50 (89.3%)
No	14 (31.8%)	5 (8.9%)
Time spent on SM		
0–1 h	27	12
1-2 h	6	13
2-4 h	3	16
4-6 h	1	6
More than 6 h	3	5
Social media anxiety (mean)	9.166 (SD = 3.767)	9.554 (SD = 3.889)
Social media utility (mean)	12.619 (SD = 4.595)	13.071 (SD = 4.778)
MASC parent total (mean)	54.627 (SD = 19.353)	58.118 (SD = 25.290)
MASC child total (mean)*	57.318 (SD = 23.008)	69.536 (SD = 26.528)
FQ child + interactions (mean) **	39.006 (SD = 14.407)	52.713 (SD = 16.379)
FQ child - interactions (mean)	32.233 (SD = 11.526)	29.059 (SD = 9.124)
FQ parent + interactions (mean) **	38.130 (SD = 12.600)	52.539 (SD = 16.515)
FQ parent - interactions (mean)	29.035 (SD = 11.397)	29.295 (SD = 10.126)

MASC-2 Multidimensional Anxiety Scale for Children 2nd Edition, SMES Social Media Experience Scale, FQ + Friendship Questionnaire - Positive Peer Interactions, *indicates significance at p <.05; **indicates significance at p<.01

Note

 * Indicates significant (p <.05) differences using Fisher's exact test or Student's t-test

*** Indicates highly significant (p < .001) differences using Fisher's exact test or Student's t-test

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Table 4

Correlation matrix of key variables in ASD sample

Variable	1	2	3	4	S	9	7
1. MASC-2 parent rated	1						
2. MASC-2 child rated	0.220	1					
3. SMES utility	-0.021	0.228	1				
4. SMES anxiety	0.152	0.447 **	0.741	-			
5. Time spent SM	0.261	-0.068	0.360*	0.150			
6. FQ parent+	-0.119	-0.166	0.348*	0.047	0.405 **	_	
7. FQ child+	-0.060 0.255	0.255	0.359*	0.231	0.179	513 **	-

Note. MASC-2 Multidimensional Anxiety Scale for Children, SMES Social Media Scale, FQ+ Friendship Questionnaire — Positive Peer Interactions

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 * Indicates significance at p < .05

**
Indicates significance at p < .01

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Table 5

Correlation matrix of key variables in Non-ASD sample

Variable	1	2	3	4	3	9	7
1. MASC-2 parent rated	1						
2. MASC-2 child rated	0.506**	_					
3. SMES utility	0.022	0.230	1				
4. SMES anxiety	0.125	0.444 **	0.541 **	1			
5. Time spent SM	-0.271	-0.098	0.433 **	0.285*	-		
6. FQ parent+	-0.334^* -0.161	-0.161	-0.196	-0.268	-0.018	-	
7. FQ child+	-0.089	0.105	-0.037	-0.013	0.120	$-0.013 0.120 0.518^{**}$	-

Note. MASC-2 Multidimensional Anxiety Scale for Children, SMES Social Media Scale, FQ+ Friendship Questionnaire — Positive Peer Interactions

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 * Indicates significance at p < .05

**
Indicates significance at p < .01

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Table 6

Results of moderation analysis using product terms in multiple regression

Model	Predictors	В (β)	SE	t	d	95% CI
1. FQ + parent rated	Constant	38.72	1.85	20.98	<0.001	34.97 to 42.47
	MASC-2 parent (mean centered)	-0.05 (-0.08)	0.10	<0.53	09.0	-0.25 to 0.15
	SMES-utility	0.67 (0.24)	0.43	1.541	0.13	-0.21 to 1.55
	MASC-2 parent × SMES-utility	-0.05 (-0.35)	0.02	-2.244	0.03	-0.10 to -0.01
	Constant	37.30	2.55	14.62	<0.001	31.13 to 42.48
	MASC-2 parent (1 SD below mean)	0.07 (0.13)	0.08	0.84	0.40	-0.10 to 0.23
	SMES-utility	1.67 (0.53)	0.53	3.14	0.00	0.59 to 2.48
	MASC-2 parent × SMES-utility	-0.06 (-0.45)	0.02	-2.37	0.02	-0.11 to -0.01
	Constant	40.47	2.69	15.06	<0.001	35.01 to 45.93
	MASC-2 parent (1 SD above mean)	-0.07(0.13)	0.08	0.84	09.0	-0.10 to 0.23
	SMES-utility	-0.54(-0.19)	0.75	- 0.72	0.47	-2.05 to 0.97
	MASC-2 parent \times SMES-utility	-0.06 (-0.62)	0.02	-2.37	0.02	-0.11 to -0.01
2. FQ + parent rated	Constant	38.14	1.88	20.30	<0.001	34.36 to 41.99
	MASC-2 parent (mean centered)	-0.14 (-0.22)	0.10	-1.43	0.16	-0.35 to 0.06
	Time spent SM (TS)	5.17 (0.51)	1.62	3.19	0.00	1.88 to 8.47
	MASC-2 parent × TS	-0.05 (-0.13)	90.0	-0.79	0.43	-0.17 to 0.07
3. FQ + child rated	Constant	38.78	2.20	17.64	<0.001	34.33 to 43.23
	MASC-2 child (mean centered)	0.10 (0.16)	0.10	1.01	0.32	-0.10 to 0.29
	SMES-utility	1.02 (0.32)	0.48	2.12	0.04	0.05 to 2.00
	MASC-2 child \times SMES-utility	0.02 (0.15)	0.02	0.98	0.34	-0.02 to 0.07
4. FQ + child rated	Constant	36.16	3.57	10.15	<0.001	28.95 to 43.37
	MASC-2 child (mean centered)	0.15 (0.24)	0.09	1.58	0.12	-0.04 to 0.34
	Time spent SM (TS)	2.02 (0.18)	1.80	1.12	0.27	-1.63 to 5.67
	MASC-2 child × TS	-0.03(-0.05)	0 08	_0 33	0.74	0.18 to 0.13

Note. FQ + Friendship Questionnaire — Positive Peer Interactions, MASC-2 Multidimensional Anxiety Scale for Children 2nd Edition, SMES Social Media Experience Scale, SM social media