Exploring the links between perceptions of protection and control online and social connectedness among socially anxious youth

Public Significance Statement:

Social internet use was found to be associated with greater feelings of social connectedness for all young adults, including those with clinical levels of social anxiety. Further, social anxiety may play a critical role in determining the nature of associations between perceptions of protection and control online, and social connectedness among young adults.

Abstract

A growing area of research has begun to explore the opportunities that social media and the internet provide for social connection. In contributing to this literature, the current study aimed to examine links between young adults' perceptions of protection and control in the online environment, social internet use, and social connectedness. Further, as online communication has been suggested to be beneficial for those who are socially anxious, we tested social anxiety as a moderator of the abovementioned associations. A sample of Australian young adults (N = 687; 59.8% female; M_{age} = 19.45 years, SD = 2.07) were included in the study. A multigroup mediation model tested the effects of perceptions of protection and control online on social connectedness, via social internet use, for groups of young adults classified as socially anxious, or low to moderate in social anxiety. For all young adults, social internet use was positively associated with social connectedness, but there were key differences in the associations between internet perceptions and social connectedness among young adults with and without social anxiety. For example, for socially anxious young adults, perceptions of control online were directly associated with lower social connectedness. Further, although perceptions of protection online were linked to lower social connectedness of those without social anxiety, the negative effect was not significant for socially anxious young adults. These findings may have implications for clinical practice, and importantly, highlight links between perceptions of online contexts and connectedness that may be driven by social anxiety.

Keywords:

Social Anxiety, Social Internet Use, Internet Perceptions, Social Connectedness, Young Adulthood

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The pervasive use of social media, particularly among young people, has inspired a shift in the discussion around internet use from predominantly focusing on negative outcomes, to exploring the potential for positive opportunities for social connection. Young adults, or those aged between 18 and 25, often report using multiple social media platforms and digital technologies (e.g., Facebook, Instagram, and Snapchat) at least daily for communication with others. Indeed, almost 50% of American young adults report that they are 'almost constantly' online (Auxier & Anderson, 2021; Perrin & Atske, 2021). Highlighting the integral role that the internet and social media play in contemporary friendships and interpersonal connections, recent research has demonstrated that for the majority of young adults, close friendships are initiated face-to-face (i.e., offline), and maintained across both online and offline settings (Scott et al., 2021). Further, preferences for offline communication with friends among adolescents have significantly declined over time in favor of digitally-mediated communication (Rideout & Robb, 2018). Such findings have prompted examination of the associations between social media and internet use on interpersonal connectedness, discussed below.

A growing literature examining the links between young adults' internet use and psychosocial well-being has demonstrated that there are positive impacts of internet use on interpersonal outcomes and social connectedness. For example, recent research has emphasized that internet and social media use provide opportunities for authentic self-presentation and self-disclosure online, greater perceived social support, and – of relevance to the current study – increased feelings of connectedness with others (Best et al., 2014; Erfani & Abedin, 2018; Quinn, 2018). Researchers have also highlighted that features unique to the internet provide important opportunities for interactions with others (e.g., Walther, 1996). Of

particular importance, it has been suggested that online communication, when utilized as an alternative or supplement to that in offline settings, may be beneficial to youth higher in social anxiety (e.g., Scott et al., 2021; Yen et al., 2012).

In the current study, we aim to explore the links between perceptions of protection and control online, social internet use, and in turn, social connectedness. Moreover, we aim to address a gap in the literature by determining whether perceptions of greater protection and control online are beneficial for socially anxious young adults. In developing the current study, we first look to the extant literature on social internet use and social connectedness, before discussing features of the internet, as well as opportunities and benefits of online settings for socially anxious young adults.

Social Internet Use and Social Connectedness

Social connectedness is defined as feelings of belonging and interpersonal connectedness to others and the social world (Erfani & Abedin, 2018). Research has demonstrated that social connectedness derived online (via Facebook) is associated with positive psychosocial outcomes such as lower depression and greater life satisfaction (Grieve et al., 2013). Further, Allen and colleagues (2014) described that connecting with friends via text, instant messaging, and social networking sites may promote feelings of belonging. In line with this, researchers have suggested that young adults' motivations for and methods of using the internet may play a key role in determining whether the impacts of internet and social media use on connectedness are beneficial in nature.

Clark and Green (2018) developed the Interpersonal Connection Behaviors Framework, in which it is suggested that "the positive consequences of any given online interaction depend on the extent to which that interaction serves a relational purpose" (p. 215). Clark and Green (2018) propose that online interactions that promote connection increase well-being, highlighting a link between socially oriented online activities (such as

chatting or commenting on content) and increased positive affect and relational closeness (e.g., Shaw & Gant, 2002; Wang et al., 2014; Wenninger et al., 2019). Supporting this claim, research has found that online interactions enhance feelings of connection towards pre-existing friends and new contacts for the majority of young people (Carpenter et al., 2018; Lenhart et al., 2015; Weinstein, 2018). Such findings suggest that, when used for social interaction, internet use may facilitate feelings of social connectedness among youth. Therefore, in the current study, we hypothesized that use of the internet for social connection and engagement would be positively associated with social connectedness (H1).

Internet Perceptions and Social Internet Use

Of critical importance in popular media research is understanding the motives behind individuals' use of the internet and social media. The uses and gratifications theory suggests that people are motivated to use the internet and social media to satisfy interpersonal needs (Papacharissi & Rubin, 2000), such as the desire to belong or to feel socially connected, and a need for self-presentation and impression management (Nadkarni & Hofmann, 2012; Throuvala et al., 2019). The hyperpersonal model of computer-mediated communication (Walther, 1996) sheds additional light on these associations by considering the impact of unique features of online contexts on interactions and self-presentation management. Specifically, communication online is frequently characterized by a lack of nonverbal cues (such as visual, auditory and context cues), and is often asynchronous in nature (i.e., does not occur in real-time). Walther (1996) proposed that such features may allow online communication to be more intimate and positive over time as compared to offline settings, as individuals are able to selectively present themselves and their personal characteristics and have greater control over what they express and share with others online.

Several other features and affordances of online contexts have been identified, including anonymity, invisibility, conversation or message control, editability, and

accessibility (Fox & McEwan, 2017; Suler, 2004; Valkenburg & Peter, 2011). Such attributes of online settings, and perceptions of them, may extend internet users' individual efficacy and assist in satisfying their motivations and needs online (Shaw et al., 2018), or transform their online interpersonal experiences (Nesi et al., 2018). For example, perceptions of the internet as a safe and controllable place with limited consequences for behavior may facilitate feelings of disinhibition, promote enhanced interaction with others, and encourage greater feelings of comfort and control over self-presentation online, as compared to offline (Schouten et al., 2007; Suler, 2004; Walther, 1996).

As the majority of young adults primarily interact with friends either online, or across online and offline settings (Scott et al., 2021), it is imperative that research examines the social consequences associated with young adults' *perceptions* of online social contexts. Madell and Muncer (2007) previously highlighted that young adults' perceived feelings of control over technology-mediated interactions was an important factor in their use of the internet for connection with others. Similarly, the perceived importance of reduced nonverbal cues and controllability of instant messaging have previously been positively associated with online self-disclosure via online disinhibition (Schouten et al., 2007). Further, research suggests a link between anonymity online and self-disclosure (Clark-Gordon et al., 2019), and highlights that online interactions may be perceived as less threatening than face-to-face interactions (Lee & Stapinski, 2012). However, limited research has investigated links between perceptions of online contexts, the ways young people socially use the internet, and broader feelings of social connectedness. In the current study, we aimed to investigate how young adults' perceptions of protection and control online were associated with social internet use. In line with past research that has demonstrated links between internet perceptions and online communication (e.g., Schouten et al., 2007), we hypothesized that greater perceptions of protection and control would be positively associated with greater

social engagement online (H2). Additionally, we proposed a mediating effect whereby we expected that perceptions of greater protection and control would be associated with more social internet use, and in turn, greater social connectedness (H3). Due to limited evidence for developing hypotheses, we posed a research question concerning novel links between internet perceptions and social connectedness: Are perceptions of protection and control online associated with social connectedness? (RQ1). Discussion of the features unique to digital and online contexts prompts consideration of whether perceptions of the internet may be particularly beneficial to young adults who are inhibited or anxious in offline social settings. The following section reviews literature to explore whether the links between internet perceptions, social internet use, and social connectedness may differ based on young adults' social anxiety levels.

The Role of Social Anxiety

Social anxiety is characterized by negative self-perceptions, communication apprehension, and fear or overestimation of negative interpersonal evaluation by others during anticipated or actual social interactions (Leary, 1983; Rapee & Heimberg, 1997). Socially anxious individuals, in comparison to their less anxious counterparts, hold greater expectations that consequences of interpersonal evaluation by others will be more serious and negative. Further, those higher in social anxiety may avoid, withdraw, or escape from, social situations and interactions, use maladaptive coping strategies, and aim to reduce the likelihood of social evaluation by adopting safety behaviors such as speaking quickly, avoiding eye contact, and showing fewer facial expressions (Henderson et al., 2014; Rapee & Heimberg, 1997; Watson & Friend, 1969).

Research has suggested that socially anxious youth may communicate online as a form of safety behavior to minimize threat in social situations (Lee & Stapinski, 2012). In line with this, there is evidence that youth higher in social anxiety prefer digital environments

as an alternative to offline settings for social interaction (Caplan, 2007; Tosuntaş et al., 2020), and use the internet both as a substitute for, and to avoid, face-to-face communication (Weidman et al., 2012). Reasons for this may include that socially anxious individuals use the internet to compensate for limited social interactions offline, to seek social inclusion, and to meet new people (Papacharissi & Rubin, 2000). The social compensation hypothesis suggests that the internet may facilitate social opportunities for individuals who encounter anxiety or feel inhibited in offline settings, and provide a social environment in which anxious youth may be better able to meet their needs for social connection (Valkenburg & Peter, 2007). Past research demonstrates that social anxiety is associated with greater online self-disclosure (Chan, 2021), and that for individuals higher in social anxiety, instant messaging promotes feelings of connectedness (Lundy & Drouin, 2016).

Young adults' use of the internet as a compensatory or alternative social space may largely be driven by their perceptions of the internet as removing traditional relational barriers, and thereby facilitating social engagement. In line with the hyperpersonal model of computer-mediated communication (Walther, 1996), unique features of the internet may offer opportunities that are particularly advantageous to socially anxious youth. Perceptions of the internet as providing opportunities for invisibility and control over the timing and content of communication may foster a sense of comfort, safety, or protection in online settings, or lower anxiety when communicating online versus in face-to-face settings (Yen et al., 2012). Supporting this suggestion, a recent meta-analysis demonstrated that social anxiety is positively associated with feelings of comfort in online settings for social interaction, and with the degree to which perceptions of reduced nonverbal cues online contribute to feelings of comfort online (Prizant-Passal et al., 2016). Kamalou and colleagues (2019) found a positive association between social anxiety and preferences for methods of online communication that afford greater control over self-presentation and safety. Furthermore,

past research has determined that social anxiety is significantly associated with perceptions of online communication as more controllable, reciprocal, and deep, with reduced risks of negative evaluation online, as compared to that in face-to-face settings (Lee & Stapinski, 2012; Peter & Valkenburg, 2006). Such research highlights the importance of feelings of control and protection in the online environment for socially anxious young people.

Although some available research has considered the *predictive* effects of social anxiety on perceptions and uses of the internet and social connection, to date, limited research has considered the *moderating* effects of social anxiety on associations between internet perceptions, social internet use, and social connectedness. Therefore, we aimed to examine the whether the associations between perceptions of protection and control online, social internet use, and social connectedness differ for socially anxious individuals as compared to those with low to moderate levels of social anxiety. Although it is suggested that positive perceptions of the internet may be more beneficial to socially anxious youth than their less-anxious counterparts, there is little available evidence to guide hypothesis development. Therefore, we posed three additional research questions: Are the hypothesized positive associations between internet perceptions and social internet use stronger for socially anxious versus less-anxious young adults? (RQ2). Is the hypothesized positive association between social internet use and social connectedness stronger for socially anxious versus less-anxious young adults? (RQ3). Does social anxiety moderate the associations (if any) between protection and control online and social connectedness? (RQ4). We also conducted descriptive analyses to determine whether socially anxious young adults differed significantly from those with low to moderate social anxiety in perceptions of the internet, social internet use, and social connectedness.

Method

Participants and Procedure

A large sample of young adults (N = 687) were recruited from an Australian university. Participants were invited to complete the study for partial credit in a first-year psychology course if they were aged between 17 and 25 years and self-identified as active social media users. Purposive sampling was employed to recruit a relatively even gender split. The final sample of young adults (M = 19.45 years, SD = 2.07), included 411 (59.8%) respondents who identified as female. The ethnicity of the sample was reported as 78.5% Caucasian (White), 10.9% Asian, 1.7% Indigenous Peoples (First Nations), 1.7% African, and 7.2% from other backgrounds. The majority of the sample (N = 652, 94.9%), were domestic students. Ninety-two percent of the sample reported using social networking sites at least daily.

Prior to data collection, ethical approval was obtained from the university Human Research Ethics Committee. After providing informed consent, participants completed an anonymous online questionnaire of approximately 30 minutes in duration. The questionnaire included demographic questions, internet use questions, and a range of measures pertinent to the research questions, detailed below.

Measures

Perceptions of the Internet

Two scales (Scott et al., 2022) were included in the current study to measure young adults' perceptions of protection and control online. The prompt to the items was: "The following statements relate to features of online digital environments that might allow people to think, feel and act differently online compared to offline." Participants were asked to indicate their agreement with the items along a 5-point scale, from 1 = *Strongly disagree* to 5 = *Strongly agree*.

Protection. The average of six items was used to measure Protection, with participants indicating the extent to which they perceived opportunities to be protected,

invisible or feel safe online. Example items include “The internet protects me from the judgement of others when they can’t see me” and “The internet allows me to feel safe to express my thoughts and feelings online.” Higher scores indicate greater endorsement of feeling protected in online environments (Cronbach’s α = .86).

Control. The average of five items were used to measure Control, with participants indicating the extent to which they perceived control over their interactions with others and their self-presentation online. Example items include “The internet allows me to choose who I talk to and when to reply to messages,” and “The internet allows me to control what information I present to others about myself.” Higher scores indicate greater perceptions of control over interactions and self-presentation online (Cronbach’s α = .85).

Social Internet Use

A modified version of the Online Social Connection scale (Stuart et al., 2021) was included in the current study to measure social internet use. Participants were asked to respond to five items following the prompt, “How often do you use the internet for the following reasons?” Instead of a five-point response scale, responses were recorded on a 7-point scale from 1 = *Never*, to 7 = *Several times a day*. The items include “to keep in touch with people,” “to interact with others,” “to know what is going on with your peer group,” “to use social networking sites (e.g., Facebook, Instagram, Snapchat, Twitter),” and “to use instant messaging services (e.g., Messenger, WhatsApp or texting).” An average of the five items was computed (Cronbach’s α = .76) with higher scores indicating higher frequency of internet use for the purpose of social connection.

Social Connectedness

The 20-item Social Connectedness Scale-Revised (Lee et al., 2001) was included in the current study to measure perceptions of social connectedness and “enduring interpersonal closeness” (p. 310). The items are rated along a 6-point scale, from 1 = *Strongly disagree* to 6

= *Strongly agree*. Example items include "I am able to connect with other people", and "I see myself as a loner" (reverse scored). Higher scores indicate stronger feelings of social connectedness (Cronbach's α = .94).

Social Anxiety

The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) is a measure of social anxiety and fears of face-to-face social interaction. Participants are asked to indicate the degree to which each of the 19 items were true of them on a 5-point scale ranging from 0 = *Not at all true of me* to 4 = *Extremely true of me*. Example items include "I have difficulty making eye-contact with others", and "I feel I'll say something embarrassing when talking." The items were summed (range 0 – 76) to provide participants with total social anxiety score, and the item scores demonstrated high levels of internal consistency (Cronbach's α = .94).

Previous research has recommended several clinical cut-offs for the 20-item version of the SIAS with different samples (e.g., Heimberg et al., 1992; Peters, 2000). In the current study, we used the recommended clinical cut-off from Carleton and colleagues (2009) which is specific to the 19-item scale, has previously been used in similar samples of young adults, and has a relatively conservative cut-off of 39.5. Thus, participants categorized as socially anxious were those scoring equal to and above the clinical cut-off of 39.5 (n = 137), and the comparison group, labelled low to moderate were those scoring below 39.5 (n = 548; Carleton et al., 2009).

Descriptive statistics and Cronbach's α for all measures across the 'low to moderate social anxiety' and socially anxious groups are presented in Table 1.

[INSERT TABLE 1]

Data Analysis Strategy

Data were analyzed in three steps, conducted in SPSS Version 26 and Mplus Version 8 (Muthén & Muthén, 2017). First, descriptive statistics and bivariate correlations were

computed among the full sample. Second, t-tests were conducted between the socially anxious and less-anxious groups on measures of protection, control, social internet use, and social connectedness. Third, to test the hypotheses and research questions, a multiple-group path model was developed that included an overall predictive model of perceptions of protection and control on social connectedness via social internet use. As past research has outlined gender and age differences in both social internet use and social connectedness (e.g., Jose et al., 2012; Krasnova et al., 2017; Pujazon-Zazik & Park, 2010; Weaver et al., 2022), we controlled for the effects of these variables.

The structural model was then tested across groups (low to moderate as compared to socially anxious) to examine the proposed moderation of the mediation model by social anxiety categorization. To determine the significance of the indirect pathways, 5,000 bootstrapped samples producing 95% confidence intervals of the indirect effect were tested (Hayes, 2009). To examine whether the path coefficients were significantly different across groups, model constraints were applied whereby each pathway was tested for invariance. The model fit after each constraint was compared to the nested model fit from the unconstrained structural model. If model fit worsened when the pathways were constrained to be equal (as indicated by a significant χ^2 difference test), the pathways were considered significantly different across groups.

Model fit was assessed according to the following indices and cut-off values: the root mean square error of approximation (RMSEA) with a value of less than or approaching .06, the comparative fit index (CFI) with a value greater than .95, and the standardized root mean square residual (SRMR) with a value of less than .10 (Hu & Bentler, 1999; Weston & Gore, 2006). We also report the chi-square index (χ2), with non-significant χ2 indicating better model fit (Weston & Gore, 2006).

The data used in the research will be shared with legitimate researchers on a case-by-case basis in light of confidentiality and ethical considerations. The materials used in the research cannot be publicly shared but are available upon request from the first author.

Results

Correlations and Descriptive Statistics

Bivariate correlations among the variables in the full sample are presented in Table 2. Protection and control were significantly and positively correlated, however only control was significantly and positively associated with social internet use. Social internet use was significantly and positively associated with social connectedness, and connectedness was significantly negatively correlated with protection online. Social anxiety was positively correlated with both perceptions of protection and control online, and demonstrated a strong, negative correlation with social connectedness. Regarding the covariates, age was negatively associated with social internet use, whereas gender demonstrated a significant positive association with social internet use (females were more likely than males to engage in social internet use). Neither age nor gender were significantly associated with social connectedness.

[INSERT TABLE 2]

Descriptive Analyses

Independent samples t-tests were conducted to determine whether there were significant differences between socially anxious and less-anxious young adults on measures of protection, control, social internet use, and social connectedness. Results indicated that with or without Bonferroni corrections for multiple comparisons (alpha set to .05/4 = .0125), the socially anxious group reported significantly higher perceptions of protection online, and significantly lower social connectedness than young adults with low to moderate social anxiety. There were no differences between the socially anxious and less-anxious groups in

perceptions of control or the frequency of social internet use. See Table 1 for descriptive statistics and t-test results.

Model Testing

A path model was developed to test the effects of protection and control on social connectedness via social internet use as well as to examine whether social anxiety acted as a moderator of the associations. First, the model was run separately for the two anxiety groups. Model fit for both the low to moderate social anxiety group (χ^2 (3) = 11.14, p = .01, CFI = .91, RMSEA = .07 [0.03, 0.12], SRMR = .03) and the socially anxious group (χ^2 (3) = 2.39, p = .50, CFI = 1.0, RMSEA = .00 [0.00, 0.13], SRMR = .03) was good. Following these initial tests, the nested, fully unconstrained multigroup mediation model was run and demonstrated good model fit (χ^2 (6) = 13.80, p = .03, CFI = .94, RMSEA = .06 [0.02, 0.11], SRMR = .03). Coefficients for direct, indirect, and total effects across social anxiety groups for the unconstrained model are presented in Table 3, with direct effects also visually presented in Figure 1.

[INSERT TABLE 3]

The path model concurrently tested both the direct relationships of perceptions of protection and control in the online environment on social connectedness, and indirect effects via the frequency of internet use for the purpose of social connection (see Figure 1). Differences and similarities in the pathways across groups were assessed using model constraints, in which each pathway in the structural model was constrained to be equal (treated as invariant). In terms of direct effects, results indicated that greater perceptions of protection online were significantly negatively associated with social connectedness in the group of young adults with low to moderate social anxiety. In the socially anxious group, however, the negative effect of protection on social connectedness was not significant. Model constraints determined that the path between protection and social connectedness was not

significantly different between groups, and (when the path was constrained) that greater perceptions of protection online were significantly negatively associated with social connectedness for all young adults. Furthermore, control was a significant, negative predictor of social connectedness in the socially anxious group but was not a significant predictor of connectedness for less-anxious young adults. This pathway was found to be variant across groups, indicating a statistically significant difference between socially anxious young adults and their less-anxious counterparts, χ^2 (7) = 19.64, $p < .05$. Regarding the main effects of perceptions of protection and control on social internet use, there were no significant effects of protection in either group; however, providing partial support for H2, there was a positive association between control and social internet use across both groups of young adults. Finally, social internet use was a significant, positive predictor of social connectedness in both groups of young adults (H1 supported). Each of these pathways was invariant across the low to moderate and high social anxiety groups.

[INSERT FIGURE 1]

In terms of indirect effects across groups, there were no indirect effects from protection to social connectedness via social internet use in either group. There was, however, a positive indirect association between perceptions of control and social connectedness for both groups of young adults, whereby control was related to higher social connectedness via greater social internet use (H3 partially supported). Notably, the strength of the standardized indirect effect was the same in both groups (β = .06), but the effect was only significant in the less-anxious group. Upon testing the equality of indirect effects across groups, it was determined that the indirect estimates were not significantly different (B = -.01, *SE* = .04, *p* = .82). The observed difference in significance of the indirect pathways in the unconstrained model may be due to differences in sample sizes between the socially anxious and less-anxious groups.

Discussion

The current study aimed to contribute to our understanding of how young adults' perceptions of the internet are associated with their social internet use and social connectedness. Further, we aimed to examine differences in the relationships between these constructs for socially anxious versus less-anxious young adults. The results of our study provide insight into the ways that young adults' perceptions of the internet may influence their social internet use and feelings of social connectedness, and address a gap in the literature by demonstrating differences in these links depending on individuals' levels of social anxiety. Our key findings are discussed in detail below.

Individual Differences: Social Anxiety

First, in discussing our descriptive analyses, we demonstrated that socially anxious young adults perceived the internet to be significantly more protective than young adults with low to moderate social anxiety. This result provides clear evidence that young adults who are anxious about connecting with others in offline settings perceive the internet as a space in which they can feel safe and invisible, and corroborates previous research that has found an association between social anxiety and reduced perceptions of threat in online versus offline interactions (Lee & Stapinski, 2012). In line with past research (e.g., Lee et al., 2001), we also demonstrated that socially anxious young adults reported significantly lower social connectedness than their less-anxious counterparts. In fact, the socially anxious group reported social connectedness scores that were more than one standard deviation *lower* than the less-anxious sample. Notably, however, socially anxious young adults did not report perceiving that the internet affords greater control over social interactions and self-presentation in the online environment, nor did they differ in levels of social internet use as compared than their less-anxious counterparts. This finding supports past research that found there was no significant association between social anxiety and time spent engaging with

others online (e.g., Doorley et al., 2020; Prizant-Passal et al., 2016). However, the finding is novel in that it demonstrates that in online settings, social engagement levels among socially anxious and less-anxious young adults appear commensurate.

Social Internet Use and Social Connectedness

Beyond describing differences between socially anxious and less-anxious young adults on levels of the core constructs, the current study examined the role of social anxiety in moderating the associations between perceptions of the internet, social internet use, and social connectedness. First, we found that for all young adults, irrespective of social anxiety, greater levels of social internet use were associated with higher social connectedness. This finding provides support for the Interpersonal Connection Behaviors Framework (Clark & Green, 2018) and may be interpreted by revisiting the uses and gratifications approach to internet and social media use (Papacharissi & Rubin, 2000). Specifically, we found that young adults who reported more frequent social internet use, and therefore were likely using the internet to meet social connection needs, reported higher social connectedness. The current findings also suggest that online social connection can provide opportunities for socially anxious young adults to enhance their feelings of connectedness with others, which may be protective against other issues, such as loneliness (Lee et al., 2001). The next sections will discuss key results of the current study that stem from the interplay between social anxiety and internet perceptions.

Links between Perceptions of the Internet and Social Connectedness

Although we posed a research question (rather than hypotheses) about the direct links between perceptions of the internet and social connectedness, it was unexpected that perceptions of the internet as affording protection would be negatively associated with social connectedness for young adults. Effectively, perceiving the internet to offer protection as a result of being physically removed from others in the online environment was associated with

lower feelings of personal social connection (when pathways were constrained across groups). Nesi and colleagues (2018) describe that reduced nonverbal cues online may act as barriers to both the quality of interactions and to social support processes in the online environment. As such, young adults who perceive the internet as being protective may report lower social connectedness due to the perceived distance from others in online contexts, suggesting that feelings and perceptions of protection – for both oneself and others – may lead to challenges in a context where young adults aim to foster social connections.

Notably the measures assessed young adults' perceptions of the *online environment* rather than attitudes or behaviors. Perceptions of the internet as being protective have previously been associated with online disinhibition (i.e., reductions in restraint in the online as compared to offline environment) – a construct that has been found to be related to a range of harmful online behaviors such as cyberbullying (Scott et al., 2022; Stuart & Scott, 2021). As such, young adults' perceptions of protection may have been informed by both understandings of how the internet allows them to be safe and invisible as individuals, and how the internet allows *others* to be protected or anonymous. Thus, those young adults who believe that the internet can protect or hide both oneself and others may be less likely to report having meaningful connections. An alternative explanation for this finding may be that bidirectional associations are possible among these variables; those young adults with lower social connectedness may have fewer trusting relationships, and thus be more likely to identify threats to connection (through the form of protection and invisibility) in any given context. To better understand the directionality of these effects, longitudinal research is needed.

Furthermore, in our model, perceptions of protection were not significantly associated with social internet use for either group of young adults. Thus, although socially anxious young adults may perceive the online environment as affording greater protection, this does

not seem to translate to using the internet *more* to interact with others. However, perceptions of protection online may allow socially anxious young adults to communicate with others online at commensurate levels with their less-anxious peers. This is something not achieved in offline settings, where socially anxious adults engage in significantly less frequent social interaction than their less-anxious counterparts (Piccirillo et al., 2016).

Counterintuitively, we found a direct, negative association between perceptions of control online and social connectedness for socially anxious young adults – a finding that was not replicated for less-socially anxious youth. Past research demonstrates associations between social anxiety and problematic internet use or using the internet to avoid face-to-face interaction (Lee & Stapinski, 2012; Weidman et al., 2012) and as such, it is possible that perceiving the internet to afford greater control online – or the opportunity to choose who to talk to and when to reply to messages – may mean that socially anxious youth *avoid* social engagement and directly reduce their social connectedness. Similar to perceptions of protection online, responses to the control measure may be informed by young adults' perceptions of the control that *others* can choose to exert over their interactions and self-presentation online. For socially anxious young adults, this may elicit increased anxiety about the quality and depth of social connections with others, and lower perceptions of connectedness.

Turning to the association between control and social internet use, perceiving the internet as affording more control over self-presentation and interactions online was associated with more frequent social internet use for all young adults. Further, across both groups of young adults, there was evidence of a mediation effect whereby perceiving greater control online was associated with higher social internet use, and in turn, greater social connectedness. Albeit weak, this finding suggests the potential that perceptions of the internet as providing greater control over interactions and self-presentation may have some positive

outcomes for both socially anxious young adults and their less-anxious peers. Past research also suggests that young adults higher in social anxiety may use the internet as a positive substitute for face-to-face interactions (Weidman et al., 2012), and that social anxiety significantly predicts the perceived relevance of controllability within online interaction, online disinhibition, and in turn, online self-disclosure (Schouten et al., 2007).

Implications and Conclusion

The current study has contributed to the available literature and is novel in considering the predictive effects of perceptions of the internet as offering protection and control on social internet use and social connection, as moderated by social anxiety. A key strength of the current study is the large sample of young adults above the clinical cut-off for social anxiety. As socially anxious young adults were clearly disadvantaged in terms of their social connectedness, and there were distinct differences in the results between the socially anxious and less-anxious groups, it is imperative that more work is done to examine perceptions of the internet in clinical samples. The results of the current study may also have implications for clinical practice in that practitioners must be aware of how the online environment may be perceived by socially anxious youth, particularly due to increases in telehealth interventions. We highlight the need for more research to explore the potential benefits of social internet use by socially anxious young adults, but also the need to examine whether the perceived control in online settings may promote avoidance behaviors offline.

There are also some limitations of the current study that must be considered and that may provide opportunities for future research. First, we acknowledge that individuals may not provide accurate self-report assessments of their internet and social media use (Boase & Ling, 2013). Further, the included measure of Online Social Connection (Stuart et al., 2021) does not provide detailed insight into with whom or how individuals engage with others online. For instance, the measure includes an item about the *use* of social network sites,

which does not necessarily include targeted social interaction. Therefore, we suggest that future research should endeavor to use more objective and sensitive measures of the time spent engaging in online social interaction, such as log data, or specific measures of dyadic and group interactions online. Second, the current study was cross-sectional and employed a sample of undergraduate university students, which may limit generalizability of our findings to other samples, including to clinically diagnosed socially anxious youth. In order to better understand and determine causal links between perceptions of the internet, social internet use, and social connectedness, we again suggest that future research use a longitudinal design and note the potential for bidirectional associations among these variables. For example, although we have highlighted that control is a key predictor of social internet use, it is possible that if young adults are more familiar with online contexts and use them more frequently, they may become more efficacious and perceive increased control over their interactions online. Finally, it may also be possible that perceptions of protection and control online are associated with different online activities. The focus of the current study was on social internet use and social engagement; however, future research may explore how perceptions of protection and control online are associated with active or passive internet use, and more targeted online activities such as gaming.

The current study has a number of implications for our understanding of how young adults with and without social anxiety perceive the internet, and the outcomes of this for online social engagement and social connectedness. First, we demonstrated an important role of social anxiety in moderating the associations between internet perceptions and social connectedness. Our findings suggest that socially anxious young adults may perceive some aspects of the internet to be facilitative, despite being a context where there may be challenges for youth with lower social connectedness. These findings highlight a need for researchers to be more explicit about the interactions between social vulnerabilities and

perceptions of the internet on both social internet use and broader feelings of interpersonal connection. Second, we highlight the importance of perceptions of the internet in predicting social connectedness, over and above the young adults' social internet use. As young adults' online and offline lives have become increasingly intertwined, it is imperative that researchers continue to explore the impacts of perceptions of online and offline spaces on social connection. Finally, alongside emerging research (Quinn, 2018), we have demonstrated that social internet use has positive outcomes for young adults' social connectedness, and importantly, we highlight that this holds true both for youth who are socially anxious and those who are not.

Table 1

Descriptive Statistics, Internal Reliability, and Independent Samples t-test Results for Low to Moderate and Socially Anxious Groups

	Low-Moderate Social Anxiety			**Socially Anxious**			**Independent Samples t-test Results**		
	Mean	*SD*	Cronbach's α	Mean	*SD*	Cronbach's α	*t*	df	p-value
Protection	2.39	0.89	.85	2.93	0.96	.86	-6.24	683	< .001
Control	3.95	0.78	.85	4.08	0.72	.86	-1.80	683	.07
Social Internet Use	6.30	0.83	.75	6.23	0.87	.79	0.87	683	.38
Social Connectedness	4.48	0.78	.92	3.44	0.73	.91	14.21	682	< .001
Social Anxiety	19.89	10.60	.88	50.12	7.62	.71			
Age	19.48	2.13	-	19.31	1.83	-			

Note. Low-Moderate Social Anxiety N = 548. Socially Anxious N = 137.

Independent t-test groupings: 0 = *Low-Moderate Social Anxiety*, 1 = *Socially Anxious*.

Table 2

Bivariate Correlations Amongst Measures of Protection, Control, Social Internet Use, Social Connectedness, Social Anxiety, and Covariates (N = 683)

	1.	2.	3.	4.	5.	6.	7.	Mean (SD)
1. Protection	-							2.50 (0.93)
2. Control	.29***	-						3.98 (0.77)
3. Social Internet Use	.02	.15***	-					6.28 (0.84)
4. Social Connectedness	-.29***	-.06	.25***	-				4.27 (0.87)
5. Social Anxiety	.29***	.15***	-.03	-.63***	-			25.92 (15.75)
6. Age	-.05	-.04	-.14***	-.05	-.03	-		19.45 (2.08)
7. Gender [a]	-.02	.19***	.18***	.01	.15***	-.12**	-	

Note. [a] Gender: 0 = *Male*, 1 = *Female*. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3

Bootstrapped Standardized Direct, Indirect, and Total Effects and 95% Confidence Intervals (95% CI) of the Multigroup Mediation Model (N = 685)

	Direct				**Indirect**		**Total**	
Low-Moderate Social Anxiety	Social Internet Use		Social Connectedness		On Social Connectedness via Social Internet Use		Social Connectedness	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Protection	-.03	-.12, .06	-.22***	-.31, -.13	-.01	-.04, .02	-.23***	-.32, -.14
Control	.20**	.08, .32	.01	-.09, .11	.06*	.02, .10	.06	-.04, .16
Social Internet Use	-		.28***	.19, .36				
Covariates								
Gender [a]	.11*	.03, .21	-.00	-.09, .08				
Age	-.11*	-.20, -.02	-.05	-.12, .04				

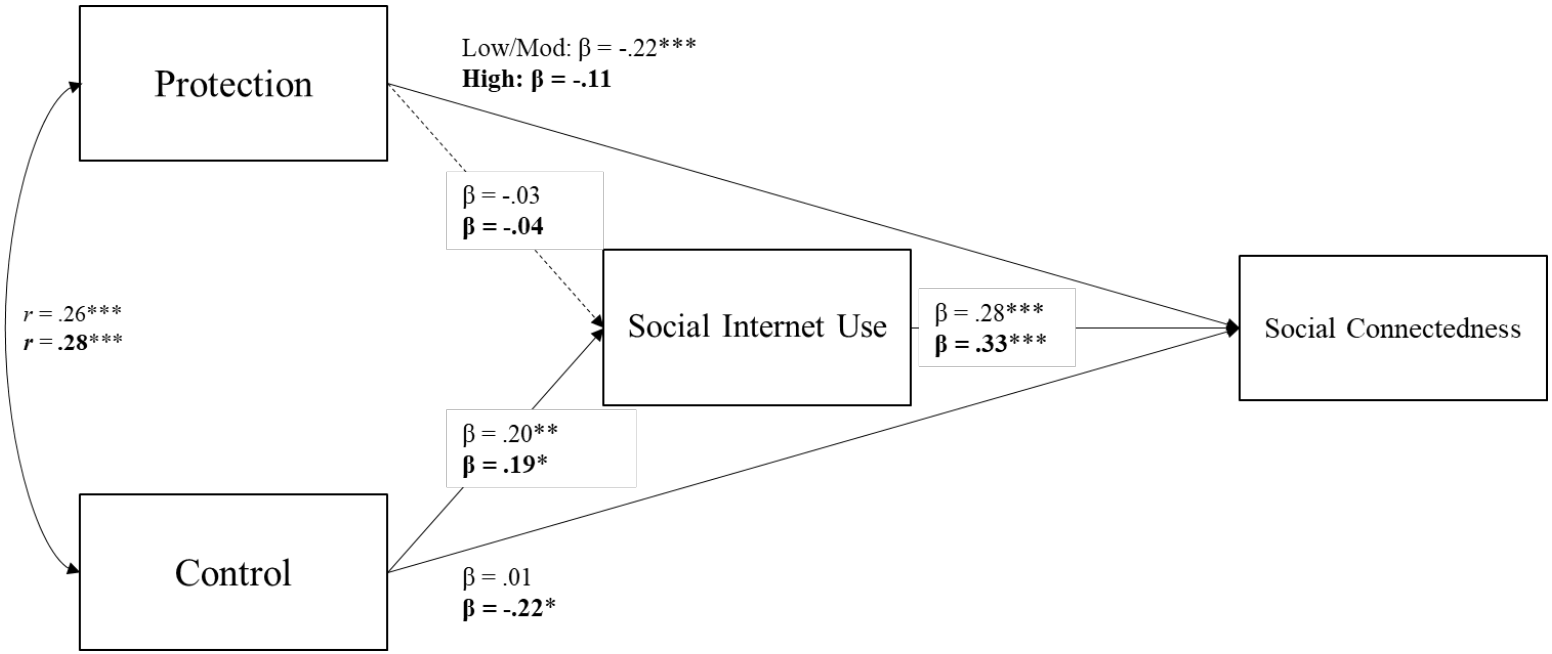
	Direct				**Indirect**		**Total**	
Socially Anxious	Social Internet Use		Social connectedness		On Social Connectedness via Social Internet Use		Social Connectedness	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Protection	-.04	-.22, .14	-.11	-.28, .07	-.01	-.06, .05	-.12	-.31, .07
Control	.19*	.002, .37	-.22*	-.40, -.03	.06	.001, .13	-.16	-.36, .05
Social Internet Use	-		.33***	.17, .47				
Covariates								
Gender [a]	.05	-.12, .22	.08	-.06, .23				
Age	-.10	-.34, .10	.02	-.16, .21				

Note. [a] Gender: 0 = *Male*, 1 = *Female*. Low-Moderate Social Anxiety N = 548. Socially Anxious N = 137.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Figure 1

Multigroup Model Testing the Role of Social Anxiety on Relationships Between Protection and Control, Social Internet Use, and Social Connectedness (controlling for covariates).



Note. Low-Moderate Social Anxiety N = 548. Socially Anxious N = 137. Covariates were gender and age. Dotted lines represent non-significant relationships; solid lines represent significant paths.

Model fit: $\chi 2$ (6) = 13.80, p = .03, CFI = .94, RMSEA = .06 [0.02, 0.11], SRMR = .03.

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