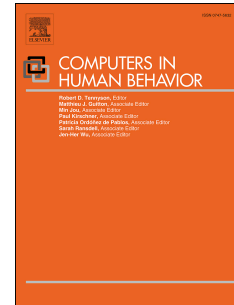


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Social Anxiety in the Digital Age: The Measurement and Sequelae of Online Safety Seeking

ACCEPTED MANUSCRIPT

Abstract

Online communication is essential to modern life, but its features may also afford socially anxious individuals the ability to conceal themselves, or parts of themselves, from evaluation by others. In this way, Internet-based social interaction may function as a form of *safety behavior* for socially anxious people seeking to avoid face-to-face encounters. To enhance our understanding of how social anxiety manifests online and examine the nature and impact of safety behaviors within online social contexts, we developed the Seeking Online Safety Questionnaire (SOSQ). The SOSQ measures the degree to which specific features of online communication contribute to the perception of interpersonal safety in online contexts. We explored the measure's factor structure and psychometric properties in a sample of 374 participants who completed the online survey through Mechanical Turk. Exploratory factor analysis suggested two correlated factors: control over self-presentation, and control over personal information. The SOSQ showed good convergent validity, such that as each of the SOSQ factors and total score increased, so too did participants' trait social anxiety, concerns about self-attribute flaws, fear of negative evaluation, and use of offline safety behaviors. Regression analyses demonstrated that control over online self-presentation explained unique variance in social anxiety symptoms and fear of negative evaluation over and above control over personal information. Results expand our understanding of social anxiety-driven safety behaviors in online contexts, which have important implications for conceptualizing the nature and treatment of social anxiety.

Keywords: Social Anxiety, Safety Behavior, Computer Mediated Communication, Affordances, Self-Report Measure, Psychometric

Social Anxiety in the Digital Age: The Measurement and Sequelae of Online Safety Seeking

1. Introduction

The features and affordances of online communication help to determine the nature of people's online interpersonal interactions. Affordances refer to particular technological features imbedded within online platforms that enable people to extend their capacity to achieve desired outcomes (Shaw, Ellis, & Ziegler, 2018). According to both Hyperpersonal model (Walther, 1996) and Social Information Processing theory (Walther, 1992), online communication is socially appealing because its features provide a host of advantages over face-to-face interactions. In each of these models, anonymity (being able to hide one's identity or personal attributes), asynchronicity (lag in time to craft messages), and textual features are hypothesized to afford users greater ability to select behaviors strategically, make desired impressions, and be flexible in their self-presentations compared to offline contexts. Here, we propose that some of these features may be particularly appealing for people with higher levels of social anxiety, as they provide socially anxious individuals with a way to self-conceal. The purpose of this study was to design and validate a self-report measure of online safety-seeking, and explore its relation to social anxiety and associated constructs within online contexts. Although it may be self-protective and anxiety-reducing for socially anxious individuals to select online communication features strategically in order to minimize the potential for negative social evaluation, theoretical models of social anxiety suggest that the over-reliance on such strategies has the potential to be emotionally and interpersonally costly.

Trait social anxiety is most accurately conceptualized as a dimensional construct distributed normally in the population, with levels ranging from mild to extreme (Ruscio, 2010). People with high levels of trait social anxiety tend to be preoccupied about the prospect of social scrutiny and evaluation (Clark & Wells, 1995; Hofmann, 2007). At extreme levels, social anxiety is characterized by persistent

worry about appearing socially inept, anxious, and unattractive to evaluative others, resulting in rejection, exclusion, and humiliation (Moscovitch, 2009; Moscovitch & Huyder, 2011). Higher levels of social anxiety can impair peoples' social connections with others and has detrimental interpersonal consequences (Alden & Taylor, 2004). Socially anxious people report fewer social interactions, have fewer friends, and are less likely to marry or engage in sexual relationships than non-anxious individuals (Hart, Turk, Heimberg, & Liebowitz, 1999; Schneier et al., 1994).

One factor contributing to these difficulties in interpersonal relationships is the use of *safety behaviors* – mental or behavioral strategies that anxious people use to cope with or avoid feared outcomes in anxiety-provoking situations (Salkovskis, 1991; Salkovskis, Clark, & Gelder, 1996). Socially anxious people use a range of safety behaviors in anticipation of and during face-to-face social interactions, such as mentally rehearsing words before saying them, avoiding eye contact, and strategically wearing makeup or layers of clothing to conceal blushing or sweating (Cuming et al., 2009). Although safety behaviors often serve a self-concealment function and are used by socially anxious people to prevent others from evaluating them negatively (Moscovitch, 2009), their use can be costly. For example, greater use of safety behaviors has paradoxically been shown to increase the likelihood that others will judge users negatively (McManus et al., 2008; Rowa et al., 2015), at least in part because performing these behaviors occupies considerable attentional resources and makes users seem distant and unfriendly (Alden & Taylor, 2004). Moreover, safety behaviors may exacerbate rather than reduce users' anxiety and distress (Moscovitch et al., 2013). Finally, cognitive models of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997) are supported by research showing that engaging in safety behaviors might prevent socially anxious people from updating their maladaptive beliefs in social situations (e.g., Koban et al., 2017). Socially anxious people tend to underestimate their social performance (e.g., Norton & Hope, 2001) and overestimate the threat of negative social

evaluation (e.g., Huppert, Roth, & Foa, 2003). They may misattribute the non-occurrence of feared consequences (e.g., not being overtly rejected by others) to their use of safety behaviors rather than to their own capabilities and skills (Salkovskis, 1991). To this end, the elimination of safety behaviors during exposure therapy for social anxiety disorder has been shown to reduce anxiety and fear-related beliefs to a significantly greater extent than exposure therapy that does not include interventions designed to eliminate the use of safety behaviors (Kim, 2005; McManus, Sacadura, & Clark, 2008; Taylor & Alden, 2010; Wells et al., 1995).

1.1. Online Safety Behaviors

Previous research has focused on the impact of safety behaviors on socially anxious people's experiences in face-to-face social situations, but relatively few studies have examined the nature and impact of safety behaviors in an online (i.e., Internet-based) social context. We conceptualized online safety behaviors as the strategies that people use to cope with or avoid feared social and interpersonal outcomes when communicating with others within an online social environment. Some researchers have argued that simply going online to seek social interaction may constitute a type of safety behavior for socially anxious people because the online environment reduces perceptions of social threat (Lee & Stapinski, 2012; Markovitzky, Anholt, & Lipsitz, 2012; Weidman et al., 2012). Other researchers have demonstrated that socially anxious people exhibit inhibited social communications online, particularly on Facebook, suggesting that they continue to perceive some level of social threat, even online, and that they adjust their behaviors accordingly (Fernandez, Levinson, & Rodebaugh, 2012; Weidman & Levinson, 2015). To our knowledge, the current study is the first to examine the extent to which Internet users – particularly those with higher levels of social anxiety – might prefer to use specific methods or features of online communication because they provide desired affordances that increase users' feelings of interpersonal safety and control.

Social engagement with others through texting, social media, and other online platforms is now so ubiquitous among North American adolescents and adults that it commonly encompasses a – if not *the* – major component of a person's social life. Beyond the mere convenience and popularity of certain online platforms, there are factors related to *perceived safety* that may also determine the types of online environments toward which people gravitate to meet their social needs. Specifically, for people higher in social anxiety, who have higher levels of concerns about perceived social threats, text-based and nonvisual features of online communication may be important because such features allow them to hide, and therefore control, aspects of their self that they think will lead to negative consequences including negative evaluation (e.g., Caplan, 2007; McKenna & Bargh, 2000). Thus, like their use of offline safety behaviors, socially anxious individuals may strategically use or avoid particular features of online communication platforms as a way to protect themselves against the feared consequences associated with negative social evaluation. If so, socially anxious people would be expected to place greater reliance on certain features in their preferred methods of online communication based on the extent to which they perceive such features to function in a manner that is akin to the function of safety behaviors – that is, as a way to afford them protection against feared consequences.

There are many features of online communication that may afford socially anxious users the perception of increased perceived safety and control. For example, asynchronous features in online activities – that is, features that create a time-lag between sending and receiving communication – likely elevate people's sense of control over their self-presentation, thereby minimizing fear of negative social outcomes (Lee & Stapinski, 2012). Asynchronous features may also be important because they are accompanied by fewer working memory demands than are synchronous (in real-time) communications and, in turn, prompt less anxiety (Chan, 2011). Indeed, researchers have found that people high in social anxiety or high in anxious attachment use Facebook – a largely asynchronous social forum – more often

than those with lower levels of anxiety (McCord, Rodebaugh, & Levinson, 2014; Murphy & Tasker, 2011; Oldmeadow, Quinn, & Kowert, 2013; Shaw, Timpano, Tran, & Joormann, 2015). Nevertheless, even Facebook may not offer the same comforts of visual anonymity that can be found in text-based interactions or forums in which participants create screen names and avoid posting personal photos. Synchronous online activities, therefore, could be viewed as more threatening than asynchronous ones because they require spontaneous and skilled responses “on the fly.” Such activities would necessitate greater self-concealment efforts by socially anxious individuals. Additionally, visual and auditory anonymity in the context of certain (e.g., text-based) online interactions allows people to conceal aspects of themselves they view as being undesirable, including signs of anxiety and physical appearance as well as some indicators of social competence (see Moscovitch & Huyder, 2011). Indeed, Pierce (2009) found that greater social anxiety accompanied a greater likelihood of communicating with others online via text messaging as opposed to face-to-face communication, perhaps because the anonymous features of text messaging allows socially anxious people to conceal their perceived flaws. Similarly, another study found that individuals with high levels of shyness reported less self-disclosure while engaging in chat conversation with a live web camera compared with chat conversation with no webcam condition (Brunet & Schmidt, 2006). Thus, socially anxious people may be less likely to worry about their perceived flaws becoming exposed in more anonymous and less synchronous online social contexts.

The strategic decision to use particular online communication methods, features, or platforms that afford users the ability to control their self-presentation represents a somewhat different way of conceptualizing safety behaviors in social anxiety than the way offline safety behaviors have been traditionally understood. Offline, safety behaviors are specific behaviors in which people actively engage in order to avoid feeling anxious. For example, the Subtle Avoidance Frequency Examination (SAFE; Cuming et al., 2009) measures 32 offline safety behaviors including dressing in layers to avoid

people perceiving sweat, wearing makeup to hide blushing, and rehearsing excessively in order to feel prepared for a conversation. These behaviors are unnecessary in many online social contexts because the personal attributes that people are attempting to conceal while using these safety behaviors are not readily observable to others within online interactions. In fact, the self-attributes that people attempt to hide by using many of the offline safety behaviors can be hidden automatically by choosing methods of online communication with particular built-in features. For example, when people use email (a text-based, asynchronous method of communication that is not automatically embedded with visual features) they do not need to actively hide signs of anxiety such as blushing or sweating because these will not be visible to their communication partner. In this way, the choice of email over webcam might be considered a strategy that is akin to the use of safety behaviors in so far as the choice to use a particular online platform is selected in order to take advantage of the imbedded features of that platform which automatically hide the person's perceived undesirable attributes.

1.2. Current Study

In the present study, we developed and evaluated the Seeking Online Safety Questionnaire (SOSQ), a brief, new self-report measure to examine the degree to which people prefer methods or features of online communication (e.g., text messaging vs. video chat) that afford them greater levels of perceived interpersonal safety and control¹. The SOSQ is conceptualized as a measure of perceptions of safety in online communication. The higher a person's total score on the SOSQ, the more his or her

¹In contrast to our measure, the Preference for Online Social Interaction measure (POSI; Caplan, 2003, 2010) allows researchers to examine the extent to which people generally prefer online communications over offline communication. As reported by Caplan (2010), the POSI is comprised of three items: "I prefer communicating with other people online rather than face-to-face;" "I feel like I have more control over conversations online than I do in face-to-face conversations;" and "Meeting and talking with people is better when done online rather than in face-to-face situations." Items 1 and 3 assess people's general preferences for online over offline communication. Although item 2 inquires about the connection between perceived "control" and online communication preferences, it is only a single item and it does not hone in on different facets of "control" or the features of online communication that might facilitate higher or lower levels of perceived control. In contrast, the SOSQ is designed to measure more diverse and specific features of online communication (e.g., as privacy, anonymity, and asynchronicity) that may increase perceived safety for people with social anxiety.

online communication preferences are driven by the need for online safety. We examined the internal consistency, factor structure, and factor validity of the scale. Correlational analyses explored evidence of the concurrent and construct validity of the SOSQ by examining relations between total and subscale scores of the new measure and scores on well-validated measures of key social anxiety constructs, including participants' reported levels of social anxiety, self-portrayal concerns, fear of negative evaluation, and frequency of offline safety behavior use. We also examined whether unique variance in levels of trait social anxiety and fear of online negative evaluation was explained by the specific emergent factors of our newly developed measure. We hypothesized that as participants' SOSQ scores increased, so too would their levels of trait social anxiety, concerns about exposing negative self-attributes to others online, fear of online negative evaluation, and use of offline safety behaviors. We did not advance particular a priori predictions about whether any specific SOSQ factors that might emerge from our factor analysis would account for unique variance in social anxiety and fears of negative evaluation online.

2. Method

2.1. Participants

A sample of 374 participants from the USA completed the online survey through Mechanical Turk (see Table 1 for the detailed demographic information). Of these, 15 participants were excluded because they lived outside of the USA ($n = 3$) or completed fewer than 75% of the survey items ($n = 12$). Participants were between 18 and 82 years old ($M = 36.0$, $SD = 12.7$). Participants were mostly white Caucasian (75.9%), heterosexual (85.2%), and the majority reported having a post-secondary education. Most participants reported that English (96.8%) was their first language and that they read English very well (97.3%). On average, they possessed 3.9 ($SD = 2.6$) Internet-connected devices and had spent an

average of 15.3 years ($SD = 4.7$) using the Internet. They reported spending an average of 10.4 ($SD = 6.7$) active hours per weekday and an average of 6.9 ($SD = 4.6$) per weekend on the Internet.

Table 1
Demographic Characteristic of Participants.

Variable	Participants ($n=341$)
Gender (%)	
Female	68.2%
Male	30.5%
Others	1.4%
Race/Ethnicity (%)	
White/Caucasian	75.9%
Black/African American	9.1
Asian	6.1%
Hispanic or Latino	4.8%
Other ethnicities	3.4%
Sexual Identity (%)	
Heterosexual	85.2%
Bisexual	7.3%
Gay	2.7%
Lesbian	1.3%
Other	3.5%
Marital Status (%)	
Single	45.2%
Married/common law/ engaged/living with a partner	42.7%
Divorced/separated	9.1%
Widowed	1.9%
Other	0.8%

$N = 341$

2.2. Procedure

This study was completed entirely online. Mechanical Turk users located in the United States with at least a 95% success rate on previous Mechanical Turk tasks were invited to participate in an online survey about “Online and Offline Social Behaviors.” The survey was hosted on the QualtricsTM survey system. To standardize the social context and ensure adequate

provocation of social anxiety, the study began by instructing participants to imagine interacting with a new acquaintance that they had met only once before, in an offline setting, and wished to get to know better. The new acquaintance scenario was presented as follows: *Imagine that you have recently met someone new. You have met this person only once and for a brief amount of time, perhaps at work, while attending a course, at an event, or in some type of similar setting. Following this initial brief meeting, you are interested in connecting with this person again and getting to know them. For all of the next questions that ask you to think or imagine interacting with this new acquaintance, please keep this scenario in mind.* We then asked participants to keep this context in mind while responding to the SOSQ and the other questionnaires that followed. Subsequently, participants were primed to consider a variety of online methods of communication that they could choose to use to interact with the new acquaintance online (e.g., email versus instant messenger). They were then instructed to complete the SOSQ with their choices in mind. Participants further completed the remaining measures in the order described below. We also collected additional questionnaire data that were not pertinent to the current article. After completing the survey, participants were debriefed and remunerated \$1.00 for their participation. This study was approved by the university's Office of Research Ethics (ORE).

2.3. Measures

2.3.1. Demographic Questionnaire. Participants answered a variety of questions about their demographic (e.g., age, gender) and background (e.g., Internet experience) characteristics.

2.3.2. Social Phobia Inventory (SPIN; Connor et al., 2000). Participants rated each of 17-items about three key dimensions of social anxiety (fear, avoidance, and physiological discomfort) using a 4-point Likert scale ranging from 0 (not at all) to 4 (extremely). Responses were summed to create a total scale score ranging from 0 – 68; higher scores represent greater social anxiety. The SPIN has been

shown to have high internal consistency, good test–retest reliability, strong convergent and divergent validity, and good construct validity (Antony, Coons, McCabe, Ashbaugh, & Swinson, 2006; Connor et al., 2000). In the current study, the internal consistency was excellent ($\alpha = .95$).

2.3.3. *The Negative Self-Portrayal Scale (NSPS; Moscovitch & Huyder, 2011)* is a self-report questionnaire that assesses the extent to which people are concerned about revealing particular self-attributes to scrutiny by others. The NSPS comprises three non-orthogonal categories of self-attribute concerns: signs of anxiety (e.g., sweating, blushing); physical appearance (e.g., dressing inappropriately, appearing fat); and social competence (e.g., appearing aloof, boring). Participants rated their level of concern across each of 27 specific self-attributes on a 5-point Likert scale from 1 (not at all) to 5 (extremely). For this study, participants were asked to rate their concerns while they imagined interacting with a new acquaintance online. Full scale scores ranged from 27 to 135, with higher scores representing greater levels of concern overall. Research supports the internal consistency, test-retest reliability, convergent and discriminant validity for the full scale (Moscovitch & Huyder, 2011). In this study, we found excellent internal consistency for the total score when participants rated their concerns within the online context ($\alpha = .95$).

2.3.4. *The Brief Fear of Negative Evaluation Scale II (bFNEII; Carleton, McCreary, Norton, & Asmundson, 2006)* is a 12-items condensed version of the fear of negative evaluation scale (Watson & Friend, 1969). This measure is designed to assess fear of negative evaluation in offline communication generally. Participants rated the extent to which each statement applied more or less to themselves (e.g., “I am frequently afraid of other people noticing my shortcomings”) on a scale of 1 (not at all) to 5 (extremely). Researchers have found high convergent validity and good internal consistency for both the brief and full fear of negative evaluation scales (Carleton et al., 2006; Lee & Stapinski, 2012). To fit our scenario context, we adapted the bFNEII instructions and items to assess fear of negative evaluation

while interacting with a new acquaintance in an online context. In the current study, the adapted measure demonstrated excellent internal consistency in online contexts ($\alpha = .98$).

2.3.5. *Seeking Online Safety Questionnaire (SOSQ)*. Items for this new measure were developed based on empirical and theoretical research on features of the Internet that might appeal to people high in social anxiety (e.g., Chan, 2011; Lee & Stapinski, 2012). As state above, prior to completing this measure, respondents were primed to consider a variety of online methods of communication that they could choose to use to interact with the new acquaintance online (e.g., audio-only chat versus video chat). Respondents then completed the SOSQ, in which they rated the degree to which particular safety features were important in forming their stated preferences on the priming task. These ratings were completed on a 7-point Likert scale from 1 (not important) to 7 (extremely important). Specifically, the SOSQ instructions were presented as follows: *People consider a number of different factors when choosing which method of online communication to use. Think about the choices you made on the previous questionnaire, in which you picked one of two options to interact or communicate online with the new person from the scenario whom you have met only once before offline. Each statement below represents one factor that people might consider when making their choices between the options presented in the items on the previous scale. Please indicate the extent to which each statement is important for your own preferences and choices.* Example SOSQ items include: “Allows me the ability to conceal visual aspects of myself”, and “Gives me control over how much information the person learns”. We worded items using layman’s terminology to improve their readability; for example, instead of using the description “it is asynchronous”, we described what asynchronicity means (i.e., “allows me time to craft the message that I want to send”).

We piloted the measure on a group of seven undergraduate and graduate student social anxiety researchers to ensure clarity of instructions. Based on their feedback, we adjusted the wording in slight

ways prior to administration to study participants. After data collection, based on feedback from a researcher external to the current research group, we dropped one item (i.e., “gives access to information about me beyond what I include in the message”) because the wording of the item suggested a need for reverse scoring, and research suggests that reverse-scored items may hinder the psychometric performance of self-report measures of social anxiety (e.g., Rodebaugh, Woods & Heimberg, 2007).

We examined internal consistency and inter-item correlations on the remaining 9-item scale; we found excellent internal consistency ($\alpha = .81$), with inter-item correlations ranging from .08-.66, and all corrected item-total correlations above .38. There were two highly overlapping items that were intercorrelated quite strongly at $r = .66$ (“Prevents people from creating an unrealistically positive version of me” and “Allows me to prevent people from judging me too favorably”). Therefore, we conducted the factor analysis (see results section) with and without each of these items before deciding to drop the latter of the two, which had lower factor loadings, thus leaving an 8-item measure. Total scores on the 8-item scale ranged from 8 to 56, with higher scores indicating greater importance placed on safety features in online communications. The final measure, including instructions, is provided in the Appendix.

2.3.6. The Subtle Avoidance Frequency Examination (SAFE; Cuming et al., 2009) is a 32-item questionnaire that assesses the frequency of engaging in safety behaviors in offline social situations. Participants rated how often they tend to use each of the 32 behaviors (e.g., “Rehearse sentences in your mind”) during offline social situations on a 6-point Likert scale ranging from 0 (never) to 5 (always). Responses were summed to create a total score with higher scores representing more frequent use of offline safety behaviors. Past research has supported the construct, convergent, and divergent validity, and internal consistency of this measure for socially anxious people (Cuming et al., 2009). This measure demonstrated excellent internal consistency ($\alpha = .95$) in the current study.

3. Results

3.1. Preliminary Analyses

Prior to conducting our analyses, we ensured that the data met assumptions of normality by visually examining the distribution of scores in histograms, the normal Q-Q plot, inspecting the standard error of skewness and kurtosis, and inspecting the data for discontinuous and extreme outliers. Data screening revealed 10 univariate and 23 multivariate outliers (>3 SDs from the mean), which were removed from the data. We then examined the extent and pattern of missing data for the scale scores using Missing Values Analysis in SPSS 23. The amount of missing data ranged from 0.8 to 5.6 percent across measures. Because all missing data were missing either completely at random or at random based on the results of Little's MCAR tests, missing item-level data were replaced using the Multiple Imputation procedure with 20 imputations (Little & Rubin, 2002). Consistent with the recommendations of Osborn and Overlay (2004), we report results using the sample with no outliers ($N = 341$).

3.2. Item Characteristics and Exploratory Factor Analysis of the SOSQ

The SOSQ item means and standard deviations are reported in Table 2. We conducted a series of EFAs with principal axis factoring extraction to examine the underlying structure of the SOSQ for the 9-item, and two 8-item versions of the measure (one with each of the overlapping items described above). We used an oblique (promax) rotation because we expected that the factors of the SOSQ would correlate with each other. After examining all eigenvalues greater than 1, the scree plots, and factor loadings $> .45$ with no cross loadings $> .25$ (Tabachnick & Fidell, 2011), we retained 8 items that demonstrated the best fit. The resulting two-factor solution explained 44.64%. The first factor explained 34.52% of the variance and was labeled *control over self-presentation*. We labeled the second factor, which explained 10.12% of the variance, *control over personal information*. The final rotated factor loadings from the EFA pattern matrix are depicted in Table 2. The internal consistencies for the SOSQ total score and

individual factors were as follows: total score ($\alpha = .79$); control over self-presentation ($\alpha = .77$); and control over personal information ($\alpha = .69$).

Table 2

Means, Standard Deviations, and Rotated Factor Loadings from the Pattern Matrix for the Items of the SOSQ.

Item	<i>M</i>	<i>SD</i>	<i>Control Self- Presentation</i>	<i>Control Personal Information</i>
Control Self-Presentation				
6. Allows me to create an artificial but favorable impression of myself.	2.99	1.84	.79	-.16
7. Allows me to depict the best version of myself.	4.39	1.78	.66	.13
9. Prevents people from creating an unrealistically negative version of me.	4.30	1.85	.63	.08
8. Prevents people from creating an unrealistically positive version of me.	3.53	1.79	.52	.00
3. Allows me the ability to conceal visual aspects of myself.	4.14	1.99	.46	.25
Control Personal Information				
2. Gives me control over how much information the person learns.	5.46	1.46	-.03	.83
1. Allows me time to craft the message that I want to send.	5.48	1.45	-.03	.69
10. Protects my privacy most effectively	5.16	1.68	.01	.48

Note. SOSQ instructions are presented in the Appendix.

3.3 Concurrent Validity of the SOSQ

We examined the bivariate correlations between each of the factor scores on the SOSQ. We found that the two factors on the SOSQ were significantly positively correlated with each other, such that the desire for control over self-presentation increased as desire for control over personal information increased ($r = .43, p < .001$). Additionally, we examined the bivariate correlations between the total SOSQ score and subscale scores with the SPIN, bFNEII online, NSPS online, and SAFE. The results are reported in Table 3. In sum, SOSQ total scores were significantly correlated with all of these measures, indicating in particular that participants who placed greater importance on selecting methods of online communication that afforded them more control over self-presentation also reported higher social anxiety, as well as greater concern about revealing self-attributes online, fear of negative evaluation online, and use of offline safety behaviors.

Table 3

Means, Standard Deviations, and Bivariate Correlations Between Safety-Seeking Online and Social Anxiety, Perceived Online Threat, and Use of Offline Safety Behaviors.

Variable	<i>M</i>	<i>SD</i>	<i>SPIN r</i>	<i>bFNE r</i>	<i>NSPS r</i>	<i>SAFE r</i>
SOSQ Total Score	35.48	8.92	.27**	.31**	.19**	.34**
Control Self-Presentation	19.36	6.73	.30**	.31**	.24**	.38**
Control Personal Information	16.11	3.61	.11*	.18**	.01	.12*

Note: SOSQ = Seeking Online Safety Questionnaire; SPIN = Social Phobia Inventory; bFNE = Brief Fear of Negative Evaluation-II for the online context; NSPS = Negative Self-Portrayal Scale for the online context; SAFE = Subtle Avoidance Frequency Examination for the offline context

$N = 341$

* $p < .05$; ** $p < .01$

3.4. Construct Validity of the SOSQ

We used multiple regression to test the two SOSQ subscales against each other in separate analyses predicting levels of trait social anxiety (SPIN scores) and online fears of negative evaluation (bFNEII online). We examined these two outcome variables because they most strongly represent the overarching construct of social anxiety. Results, which are summarized in Table 4, indicated that *control over self-presentation* explained a significant amount of the variance in both outcome variables: SPIN scores [$F(2, 338) = 15.77, p < .001, R^2 = .09$]; bFNEII scores [$F(2, 338) = 18.48, p < .001, R^2 = .10$]. In contrast, as shown in Table 4, *control over personal information* did not contribute significant variance to any outcomes when controlling for *control over self-presentation*. Thus, the results of the regression analyses suggest that of the two SOSQ subscales, only *control over self-presentation* predicts significant variance in self-reported social anxiety symptoms and online fears of negative evaluation.

Table 4

Multiple Linear Regression Analysis Predicting Trait Social Anxiety Symptoms and Online Fears of Negative Evaluation as Outcome Variables.

Variable	SPIN			BFNE		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Control Self-Presentation	.68	.13	.30**	.51	.10	.28**
Control Personal Information	-.08	.24	-.02	.21	.20	.07
Model R^2		.09			.10	
Model <i>F</i>		15.77			18.48	

$N = 341$

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

4. Discussion

The goal of this study was to improve knowledge on social anxiety in online contexts by

developing a new self-report measure of safety-seeking in online methods of communication, and exploring the validity of this measure. Results revealed that the SOSQ could be organized into two nonorthogonal factors, which we labelled *control over self-presentation* and *control over personal information*. The total and subscale scores of the SOSQ demonstrated satisfactory internal consistency. Moreover, as each of the SOSQ factors or total score increased, so too did people's trait social anxiety, concerns about self-attribute flaws, fear of negative evaluation, and use of offline safety behaviors – providing evidence for the new measure's convergent validity. Finally, regression analyses revealed that only *control over self-presentation* explained unique variance in social anxiety symptoms and online fears of negative evaluation over and above *control over personal information*, suggesting that although people may seek online safety because of a desire to control either self-presentation or personal information, it is only the desire to control self-presentation that is related to higher levels of social anxiety and fears of evaluation by others. These findings provide novel information on the cognitive underpinnings of safety-seeking in selecting preferences for interactive communication with others in online contexts.

4.1. Social anxiety and perceptions of safety features in online communication

Our results demonstrated that people higher in trait social anxiety and fear of negative evaluation online placed greater importance on choosing preferred methods of online communication that afforded them control over self-presentation. These findings are consistent with previous research that has found that socially anxious people prefer social situations that allow them greater control over their personal information including situations that increase their privacy as well as those that involve more anonymous and asynchronous methods of communication over less anonymous and asynchronous options (e.g., Joinson, Reips, Buchanan, & Schofield, 2010; Liu, Ang, & Lwin, 2013; McCord et al., 2014; Oldmeadow et al., 2013; Pierce, 2009; Shaw et al., 2015; Stone, 1986). Our findings are also

consistent with cyberpsychology theories that point to multiple characteristics in addition to anonymity and asynchronicity that may make online communication appealing (e.g., Cooper, 2002; Lea & Spears, 1991; Suler, 2004), particularly for those with higher levels of social anxiety who may be seeking to gain greater control over their self-presentation in a manner that is unencumbered by the anxiety-provoking demands of offline social encounters (e.g., Chan, 2011; Lee & Stapinski, 2012).

Choosing to use particular online communication methods and features may function as a strategic safety behavior similar to offline safety behaviors in which people deliberately choose strategies that, at least in their minds, reduce the possibility of receiving negative social evaluation from others, often by increasing self-concealment and control (Alden & Taylor, 2004). Indeed, consistent with past research (Lee & Stapinski, 2012; Markovitzky et al., 2012; Weidman et al., 2012), we found that people who reported greater importance of safety features in online communication also reported greater use of safety behaviors offline, and also that higher social anxiety coincided with greater safety behaviors both online and offline (McManus et al., 2008; Moscovitch et al., 2013). Together, these findings suggest that people higher in social anxiety likely have a repertoire of safety behaviors for both offline and online social interactions.

Research has shown that different types of social safety behaviors may be used strategically in offline social contexts to manage the particular types of concerns that arise within those situations (see Cuming et al., 2009; Moscovitch, 2009; Moscovitch & Huyder, 2011; Plasencia, Alden, & Taylor, 2011). Our findings highlight the need for researchers and clinicians to consider the particular features of online social contexts that afford people interpersonal safety alongside the oft-studied features of offline contexts. Doing so would help to enrich our understanding of the ways socially anxious individuals navigate and respond to the many types of social and interpersonal demands that they are likely to encounter ubiquitously within both online and offline environments during the course of their

day-to-day lives. The focus on the perceived desirability of specific features of online communication platforms is particularly important given many Internet-based social applications offer users numerous options for interacting with others, all of which vary in the ways and amount of which people could protect themselves from perceived negative social outcomes. The SOSQ contributes to research by providing a way to assess not just the online communication choices themselves, but rather the importance and, therefore, arguably, the perceived function, of different features in their choices.

The importance placed on features that afford different types of personal control helps to provide clues about the underlying fears and motivations that may be driving respondents' choices. For instance, individuals who endorse a higher need for safety in online communication based on *control over personal information* may be motivated to decrease the perceived risk of others accessing their personal information and the perceived negative consequences associated with that occurring. Indeed, in our prior research, we found that people who reported greater online privacy concerns – desire to maintain control over their personal information online to prevent unauthorized use or distribution of this information – were likely to place greater importance on privacy features and asynchronicity than were those lower in these concerns (Citation Blinded for Review). Similarly, seeking online safety based on the desire to have *control over self-presentation* may reflect core concerns about the self and how others perceive the self, with a particular emphasis on the desire to present a particular view or image of the self that the person wants others to see. Consistent with extant theories of social anxiety (see Clark & Wells, 1995; Hofmann, 2007; Moscovich, 2009; Rapee & Heimberg, 1997), it was the SOSQ *self-presentation* factor, in particular, that explained unique variance in social anxiety symptoms and fears of online negative evaluation over and above the *personal information* factor.

4.2. Application of findings to clinical models of social anxiety

From an applied standpoint, the development of the SOSQ highlights the need for clinicians to

expand their assessment and treatment of social anxiety to include online social contexts. The SOSQ could be used by clinicians to gain information on the factors people consider when deciding how to interact and communicate within an online social environment. This information may be pertinent for broadening case conceptualizations of social anxiety specifically, but possibly other difficulties as well, to include online contexts. When socially anxious clients appear to make online interaction choices based on perceptions of safety, they might be encouraged within the context of therapy to expand their online communication repertoire by gradually increasing their willingness to experiment with and confront other online contexts which they deem to be “risky” by virtue of offering less protection or control over aspects of their self-presentation. Notably, exposure exercises and behavioral experiments designed to be conducted in online interactions could take place at any moment in time, even during a session, and may therefore enable greater therapeutic opportunity and flexibility than those that involve face-to-face encounters.

4.3. Limitations and future directions

There are limitations to this study and results. First, our participants were highly educated, American Adults, who were recruited on Mechanical Turk. Results of studies based on MTurk samples may be more generalizable to diverse and community-based populations than those based on student samples (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011). However, future research is needed with samples collected from different sources to replicate our results and extend psychometric information on the SOSQ, particularly its factor structure. Second, the generalizability of findings to clinical populations is unclear. Thus, further investigation of the factor structure and psychometric properties of the SOSQ is needed in future studies via the use of both exploratory and confirmatory factor analysis in new samples, including those drawn from a clinical population. Third, the context for the social paradigm was limited to only one type of interpersonal interaction involving a

“new acquaintance.” The use of this single, specific context is a strength of the study because it ensured that the social context was standardized across participants. However, using a single context also limits the generalizability of our findings to other online social contexts. For example, people’s perceptions and concerns while interacting with new acquaintances online and offline may be different than when interacting with a stranger, a group of people, or a friend. Moreover, sociodemographic aspects of the acquaintance such as age, gender, and especially the match/mix of these with the participant – information we did not provide – also may impact people’s expectations, motivations, and concerns when interacting with the hypothetical person again. In the future, researchers would benefit from examine varying types of social and interpersonal scenarios to examine whether and how socially anxious people perceive safety differently and similarly across online and offline situations. Finally, it is possible that some participants’ responses were affected by fatigue, as the survey took about 40 minutes to complete. Therefore, future research might benefit the use of a shorter survey when investigating this new measure.

4.4. Conclusion

The results of this study contribute novel information to our understanding of the factors that are likely to maintain socially anxious experiences in modern-day social contexts. Our findings suggest that people higher in social anxiety likely attend to features in methods of online communication that afford them greater feelings of interpersonal safety and control. In this way, they adopt safety strategies to mitigate the anxiety they feel in online interactions just as they tend to do offline. The development of the SOSQ as a novel measure with promising psychometric properties points to one way that social anxiety researchers and clinicians can begin to expand their work to include the online context.

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Appendix

Online Communication Preferences Questionnaire (Final Version)

People consider a number of different factors when choosing which method of online communication to use. Think about the choices you made on the previous questionnaire, in which you picked one of two options to interact or communicate online **with the new person** from the scenario whom you have met only once before offline. Each statement below represents one factor that people might consider when making their choices between the options presented in the items on the previous scale. Please indicate the extent to which each statement is important for your own preferences and choices.

Scale: 1 = Not Important to 7 = Extremely Important

1. Allows me time to craft the message that I want to send.
2. Gives me control over how much information the person learns.
3. Allows me the ability to conceal visual aspects of myself.
4. Protects my privacy most effectively.
5. Allows me to create an artificial but favorable impression of myself.
6. Allows me to depict the best version of myself.
7. Prevents people from creating an unrealistically positive version of me.
8. Prevents people from creating an unrealistically negative version of me.

The following two items were dropped from the measure based on our results: allows me to prevent people from judging me too favorably; gives access to information about me beyond what I include in the message.

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ACCEPTED MANUSCRIPT

Highlights

1. Socially anxious people are motivated to prevent others from evaluating them negatively
2. Are such motivations associated with preferred methods of online communication?
3. Developed new questionnaire to assess safety seeking online
3. New measure demonstrated strong psychometric properties
5. Importance of controlling online self-presentation was uniquely related to social anxiety