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Adolescent Safety Behaviors and Social Anxiety: Links to Psychosocial Impairments and Functioning with Unfamiliar Peer Confederates

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Abstract

Socially anxious adolescents often endure anxiety-provoking situations using *safety behaviors*: strategies for minimizing in-the-moment distress (e.g., avoiding eye contact, rehearsing statements before entering a conversation). Studies linking safety behaviors to impaired functioning have largely focused on adults. In a sample of 134 14-15 year-old adolescents, we tested whether levels of safety behaviors among socially anxious adolescents relate to multiple domains of impaired functioning. Adolescents, parents, and research personnel completed survey measures of safety behaviors and social anxiety, adolescents and parents reported about adolescents' evaluative fears and psychosocial impairments, and adolescents participated in a set of tasks designed to simulate social interactions with same-age, unfamiliar peers. Relative to other adolescents in the sample, adolescents high on both safety behaviors and social anxiety displayed greater psychosocial impairments, evaluative fears, and observed social skills deficits within social interactions. These findings have important implications for assessing and treating adolescent social anxiety.

Keywords: adolescents; multiple informants; safety behaviors; social anxiety; subtle avoidance frequency examination

Social anxiety disorder is characterized by persistent, impairing fears of social situations, particularly those situations involving interactions with unfamiliar people (American Psychiatric Association [APA], 2013), and situations where one anticipates being evaluated negatively and/or receiving a positive evaluation (Weeks & Howell, 2012). Social anxiety disorder is one of the most common mental disorders in the United States, with lifetime and 12-month prevalence rates of 13% and 7.4%, respectively (Kessler et al., 2012). Without treatment, a social anxiety disorder diagnosis portends long-term functional impairments (e.g., Bögels et al., 2010). These impairments are particularly salient to understand among adolescents. With a median age of onset of 13, social anxiety disorder spikes in prevalence during adolescence, relative to earlier and later developmental periods (Grant et al., 2005; Kessler et al., 2005). When left untreated, social anxiety that emerges in adolescence often persists well into adulthood, and poses risk for the development of concerns beyond social anxiety, including other internalizing concerns (e.g., anxiety and mood disorders), as well as substance use and dependence (e.g., Epkins & Heckler, 2011; Marmorstein, 2012; Stein & Stein, 2008). Consequently, adolescence represents a crucial period for understanding the links between social anxiety symptoms and impairments in psychosocial functioning.

Understanding social anxiety and functional impairments involves assessing how socially anxious individuals react to social situations. Prototypically, the distress that socially anxious individuals experience in anxiety-provoking social situations often elicits avoidance (APA, 2013). This avoidance largely takes two forms. *Overt* avoidance strategies, like staying home from school on the day of class presentations or declining an invitation to a social event (e.g., birthday party), prevent the distress provoked by engaging in these situations (e.g., Thwaites & Freeston, 2005). Many, but not all, socially anxious individuals leverage these overt strategies.

Further, the impacts of overt avoidance on functioning are often self-evident (e.g., overt avoidance of class presentations resulting in an adolescent missing out on opportunities to learn academic content and skills and benefit from school). Yet, not all situations are created equally. For instance, an adolescent's parent might be unwilling to accommodate their distress and allow them to stay home from school, school personnel may be unwilling to implement strategies to support the adolescent while at school, or adolescents may suffer severe consequences to their social life if they decline to attend all social events. When situations become unavoidable, socially anxious individuals experience them with intense distress (see also APA, 2013). To manage this distress, socially anxious individuals might engage in *covert* avoidance strategies, what we and others refer to as *safety behaviors* (for reviews, see Cannon et al., 2020; Piccirillo et al., 2016). For example, to minimize distress during a class presentation, an adolescent may avoid eye contact with the audience, or before going to a party, they might mentally rehearse what they might say to party attendees. Safety behaviors may assist in characterizing clients' clinical presentations and responses to treatment. In particular, those who use safety behaviors quickly learn of their distress-reducing properties (Salkovskis, 1991). That is, safety behaviors contain a reinforcing element: not only might safety behaviors result in reductions to in-the-moment distress; they may also be seen by those using them as the "secret" to successful social outcomes (McManus et al., 2008; Salkovskis et al., 1996). To the degree that safety behaviors facilitate managing social situations effectively, they beg the question: *Why should socially anxious individuals refrain from using them?*

Two lines of work point to the maladaptive outcomes stemming from use of safety behaviors. First, using safety behaviors tends to result in an expectancy that the safety behaviors dictate outcomes, not the individuals within the situations (Piccirillo et al., 2016). In this sense,

safety behaviors inhibit learning from social situations (e.g., Cannon et al., 2020). In fact, the effects of exposure-based treatments for social anxiety hinge on giving clients "practice" with or exposure to the distress experienced within social situations (e.g., Raggi et al., 2018). These therapeutic exposures allow clients to learn that not only do they habituate to in-the-moment distress, but also that feared outcomes (e.g., poorly delivered class presentation, awkward birthday party) might not always occur (e.g., class presentations sometimes go alright, and birthday parties can be fun; Sewart & Craske, 2020). Not surprisingly, clients who use safety behaviors in exposures experience inferior treatment outcomes relative to clients who refrain from using safety behaviors (e.g., Hedtke et al., 2009). Second, when a person displays safety behaviors within a social interaction, those observing that interaction and/or directly engaging with that person tend to perceive them as socially awkward, socially unskilled, and/or undesirable as an interaction partner (e.g., Rezeppa et al., 2021; Rowa et al., 2015; Stangier et al., 2006). Importantly, among those experiencing social anxiety, a key area of functional impairment involves problems with initiating and sustaining adaptive social relationships (APA, 2013; Bögels et al., 2010). Consequently, safety behaviors not only influence how socially anxious individuals react to social situations, but also how others react to them.

When understanding use of safety behaviors by adolescents, two key issues require further consideration. First, extant research on use of safety behaviors and links to functional impairments has largely focused on adults (see Piccirillo et al., 2016). Importantly, adolescents' social environments vary considerably from those of adults. Relative to adults, adolescents have limited experiences engaging in social interactions outside of formative social environments, namely the home (e.g., interactions with familiar individuals such as parents and siblings; Alfano & Beidel, 2011). As such, interactions with unfamiliar individuals outside of the

home—particularly, same-age, unfamiliar peers—represent novel social environments (e.g., Prinstein, 2017; Prinstein & Giletta, 2016). In fact, a key target of treatment among socially anxious adolescents involves reducing impairments stemming from interactions with same-age, unfamiliar peers (e.g., Cannon et al., 2020; Hofmann et al., 1999; Raggi et al., 2018). Yet, it is an open question as to whether links exist between adolescents' use of safety behaviors and impaired functioning within interactions with same-age, unfamiliar peers. A key aim of this study involved testing links between safety behaviors and interpersonal functioning by leveraging the Unfamiliar Peer Paradigm (Cannon et al., 2020): a suite of observational tasks designed to simulate adolescents' reactions to interactions with same-age, unfamiliar peers. Using youthful-looking research personnel trained to "stand in" as same-age, unfamiliar peers (hereafter referred to as *peer confederates*), several investigations support use of this paradigm and its ability to simulate anxiety-provoking social interactions with unfamiliar peers (e.g., De Los Reyes et al., 2019; Botkin et al., 2021; Karp et al., 2018). In fact, based on their observations, social anxiety survey reports completed by these peer confederates predict both adolescents' self-reported distress within the paradigm, as well as trained, independent observers' behavioral ratings of adolescents' social skills (Deros et al., 2018; Glenn et al., 2019).

Second, as mentioned previously, some but not all socially anxious individuals use safety behaviors as a means for minimizing distress, and use of these behaviors may result in impaired functioning. However, impairments linked to interpersonal functioning appear to characterize the clinical presentations of socially anxious individuals generally, not just those who use safety behaviors (APA, 2013; Bögels et al., 2010). This signals a need to understand the *incremental value* of measuring safety behaviors among adolescents, above-and-beyond just measuring their social anxiety symptoms. A key barrier to testing questions surrounding incremental value stems

from the fact that the most widely used survey measures of safety behaviors were originally developed for use with adults as self-report measures (for a review, see Piccirillo et al., 2016). This focus on self-reports lies in stark contrast with "best practices" in assessing adolescent mental health generally and social anxiety in particular (e.g., De Los Reyes & Makol, 2019; Hunsley & Mash, 2007). Indeed, to gain an accurate picture of adolescent clients' clinical presentations, assessors have long taken a multi-informant approach to assessing adolescents' mental health, which involves soliciting reports from adolescents themselves along with parents, who often initiate care on their behalf (for a review, see De Los Reyes et al., 2017). Along these lines, researchers recently demonstrated the psychometric soundness of using adolescent- and parent-report versions of a widely used adult measure of safety behaviors—the Subtle Avoidance Frequency Examination (SAFE; Cuming et al., 2009)—and, in particular, the ability to use these measures to predict adolescents' self-reported distress within the Unfamiliar Peer Paradigm (Qasmieh et al., 2018; Thomas et al., 2012).

Importantly, as observers of adolescent behavior, parents not only have a great deal of familiarity with their adolescent child, but they also tend to have limited opportunities for observing them within interactions outside of the home (e.g., Smetana, 2008). This reality of multi-informant approaches to assessing adolescents requires survey reports from informants beyond those of parents. In particular, these assessments also require informants who are *unfamiliar* to the adolescent, and who observe their behavior within interactions with unfamiliar peers. Thus, in recent work, researchers tested a parallel version of the SAFE completed by *unfamiliar untrained observers* (UUOs), who completed survey reports based on videotaped observations of social interactions between adolescents and peer confederates (Rezeppa et al., 2021). In this study, UUOs' SAFE reports demonstrated criterion-related validity in relation to

trained, independent observers' ratings of adolescent social skills. Thus, in our study, we leveraged the collective value of survey reports of adolescent safety behaviors and social anxiety from a battery of informants that included parents, adolescents, peer confederates, and UUOs.

Purpose and Hypotheses

In this study, we examined individual differences in adolescent safety behaviors and social anxiety, and their links to multiple domains of impaired functioning. We leveraged a mixed-clinical/community sample of 134 14-15 year-old adolescents who, along with their parents, peer confederates, and UUOs, completed survey measures of adolescent safety behaviors and social anxiety. Peer confederates and UUOs completed their survey measures based on observations of the adolescent within the Unfamiliar Peer Paradigm (Cannon et al., 2020), and a separate set of trained, independent observers made behavioral ratings of adolescent social skills as displayed within this paradigm. Collectively, this sample and study design allowed us to leverage the latest procedures for integrating multi-informant reports in adolescent social anxiety assessments (Kraemer et al., 2003; Makol et al., 2020), optimizing our ability to address our aims. In particular, we leveraged this approach to capture individual differences among adolescents in levels of safety behaviors and social anxiety, or groups of adolescents who displayed relatively high or low levels on both of these domains, or high levels on only one domain. We then compared these groups of adolescents on multiple impairment indices. We hypothesized that, relative to all other adolescents in our sample, the group of adolescents who displayed relatively high levels of both safety behaviors and social anxiety concerns would display the lowest levels of observed social skills within interactions with peer confederates. As a secondary aim, we tested differences among these adolescent groups on survey measures of psychosocial impairments. Further, as mentioned previously, socially anxious individuals'

functional impairments stem, in part, from fears of negative and/or positive evaluation within social situations (see Weeks & Howell, 2012). Thus, we also tested group differences on survey measures of these evaluative fears. Similar to our primary hypothesis, we expected that adolescents who displayed relatively high levels of both safety behaviors and social anxiety concerns would display the greatest levels of psychosocial impairments and evaluative fears.

Method

Participants and Procedure

Participants included 134 adolescent-parent dyads who completed various assessments as part of a well-characterized study conducted at a large, Mid-Atlantic university (De Los Reyes et al., 2019). Multiple studies have leveraged the same sample used in the present study to address aims surrounding evidence-based assessment of mental health, with a particular emphasis on adolescent social anxiety (for a review, see Cannon et al., 2020). Germane to the present study, recent work involving this sample has focused on testing the psychometric properties of our study measures, including multi-informant assessments of adolescent social anxiety and safety behaviors (Deros et al., 2018; Qasmieh et al., 2018; Rezeppa et al., 2021), and independent observers' ratings of adolescent social skills (Glenn et al., 2019). This work was instrumental in supporting our ability to use these measures to address substantive aims germane to understanding adolescent social anxiety, including the aims of the present study. Importantly, the aims of the present study are completely independent of the aims of the psychometric work cited previously, as well as all other published work on this sample to date. As such, we have yet to report findings stemming from the aims of the present study.

We recruited participants using various advertisement strategies, including online (e.g., Craigslist, laboratory website), paid advertisements on public transportation (e.g., metro stations,

buses), and flyers posted at various local businesses (e.g., cafes, libraries, supermarkets, doctors' offices). Parents responded to one of two posted advertisements targeting two groups. One advertisement offered a no-cost clinical evaluation screening for adolescent social anxiety (i.e., *clinic-referred adolescents*). The second advertisement recruited families for a non-clinical study on assessing family relationships (i.e., *community control adolescents*). Across groups, participants engaged in the same study procedures and completed the same assessments. Importantly, these groups displayed comparable demographic characteristics (see also Deros et al., 2018; Makol et al., 2020).

The eligible dyads were required (a) to speak and understand English, (b) to be able to consent to the study, (c) to have an adolescent aged 14 or 15 years-old in the household whom the parent did not report having a history of learning or developmental disabilities, and (d) to be willing to come to the laboratory at the university and have the study recorded using audiovisual equipment. We designed our inclusion criteria to ensure that participants could participate in a study that involved completion of an extensive battery of survey reports (i.e., requiring a fair degree of reading comprehension), and the ability to complete measures privately and independently (i.e., without the assistance of personnel) within the time range of our study procedures (i.e., total study time of 2-3 hours). Parents who contacted the laboratory participated in a phone screen to determine eligibility. Upon determining that a parent and their adolescent met our inclusion criteria, research personnel invited them to the laboratory to participate in the study.

For the present study, the total sample included 134 adolescent-parent dyads (45 *clinic-referred* and 89 *community control*). Adolescents were 14 or 15 years old (M = 14.5, SD = 0.5) and 89 (66.4%) adolescents were female. Parents reported adolescents' racial/ ethnic

backgrounds as African American or Black (53%); European, White or Caucasian (34%); Hispanic, Spanish or Latino/ Latina (10%); Asian American or Asian (5%); American Indian (0.7%); and "other" (7%). These rates totaled above 100% because parents could select multiple backgrounds. Parents also reported their relationship to the adolescent, which included biological mother/father (95.5%) or other parent (e.g., adopted mother/father; stepmother/father; 4.5%). Parental marital status varied, with 50% reporting that they were married, 21% never married, 16% divorced, 8% separated, 4% living with a significant other, and 0.7% widowed. Parents reported weekly household income as the following: 26% less than $500, 22% $501 and $900, and 51% $901 and above.

Unfamiliar Peer Paradigm

Adolescent participants engaged with trained peer confederates in a series of counterbalanced social interaction tasks with trained, gender-matched research personnel posing as same-age peer confederates. Consistent with prior work (Anderson & Hope, 2009; Deros et al., 2018; Glenn et al., 2019), all peer confederates were youthful-looking undergraduate or post-baccalaureate research assistants who had no prior contact with the adolescent with whom they interacted. We also masked peer confederates to the adolescent's referral status and all other clinical information about the adolescent. Peer confederates underwent extensive training that included training in the responsible conduct of research as well as specific training on serving the confederate role. Within this role, we required peer confederates to memorize and rehearse a detailed set of scripted procedures germane to administering the interaction tasks embedded in the Unfamiliar Peer Paradigm, which we describe below. Peer confederates began training by observing administration of the Unfamiliar Peer Paradigm by trained personnel. Following these observations, peer confederates engaged in a series of practice sessions focused on rehearsing

their role(s) in the paradigm (i.e., approximately 10-14 hours of practices spread out over several weeks). Following these sessions, peer confederates engaged in a formal clearing process that involved administering the paradigm to mock participants (e.g., other research personnel) and under the supervision of trained personnel in the laboratory (e.g., laboratory manager, project coordinator). In order for a peer confederate to be involved in this study, they must have been judged by trained personnel in the laboratory as prepared to serve the peer confederate role. Detailed descriptions of procedures used to train peer confederates are available online within the Open Science Framework (De Los Reyes, 2020).

The interaction tasks within the Unfamiliar Peer Paradigm included a Simulated Social Interaction Test (SSIT), Unstructured Conversation Task (UCT), and Impromptu Speech Task (IST). The SSIT mimics social situations that may elicit stress in an individual while interacting with a peer who initiates conversation and includes a series of five role-playing scenes. Each scene was of one-to-three minutes' duration and involved such social situations as offering/accepting assistance, giving/receiving a compliment, and responding to inappropriate behavior as facilitated by the peer confederates with whom adolescents interacted. The UCT simulated how an individual may interact with a peer during an extended period of time after being required to initiate conversation. Research personnel prompted adolescents to interact with a peer confederate for three minutes with the instruction to pretend it was their first day at a new school and they did not know anyone at the school. Within the UCT, we trained peer confederates to respond neutrally and let the participant lead the conversation. In the IST, adolescents were allotted three minutes to prepare to deliver a 10-minute speech to an audience consisting of two trained, unfamiliar peer confederates and the task administrator. Assigned speech topics consisted of topics not typically discussed by adolescents (i.e., politics, public

health). If after 3 minutes an adolescent wished to terminate their speech, we permitted them to do so.

Unfamiliar Untrained Observers

Using archival videos of the adolescent's participation in the Unfamiliar Peer Paradigm, 29 UUOs were randomly assigned to view up to five recordings of the social interaction tasks. After viewing the recordings, UUOs made a SAFE report about each adolescent. Importantly, unlike the independent observers described below, UUOs received no training on how to make SAFE reports. In this respect, they received measure instructions akin to the other informants involved in the study (i.e., parents, adolescents, peer confederates). Rezeppa and colleagues (2021) includes a complete description of UUOs' characteristics.

Independent Observers' Ratings of Social Skills

We leveraged behavioral reports from trained independent observers to assess social skills within the social interaction tasks, while avoiding shared method bias across informants used to assess other key constructs (i.e., social anxiety and safety behaviors). The trained independent observers, also consisting of undergraduate and post-baccalaureate research assistants, did not participate in any of the social interaction tasks as a peer confederate and did not complete SAFE reports as a UUO. Further, we masked independent observers to adolescent participants' referral status and all other clinical information.

For each adolescent, two trained independent observers viewed archived videotapes of their participation in the Unfamiliar Peer Paradigm. All trained independent observers received training on how to use the behavioral ratings of adolescent social skills. To train independent observers on the coding scheme described below, a team of eight to ten researchers (i.e., undergraduate students, post-baccalaureate research assistants, graduate students, and faculty)

participated in consensus coding meetings in which team members simultaneously viewed videos of all the social interaction tasks (i.e., SSIT, UCT, IST) performed by five adolescent participants in the sample. Following each task viewing, team members independently rated the adolescent in the video on the levels of social skills they displayed during the task, using the coding scheme below (i.e., a rating for each of the five SSIT role-plays, a rating for UCT, a rating for IST). After each team member made their ratings for a task, the entire team discussed the ratings. During this discussion, the team resolved discrepancies among ratings, and came to a final consensus rating for social skills displayed by the adolescent participant performing the task. We repeated this process for each of the five participants across all seven tasks (i.e., seven social skills consensus ratings per participant).

After creating the consensus ratings for five training cases, we trained the independent observers described previously. Each trained independent observer independently viewed videos for the five training cases and made seven social skills ratings per case. After making their training ratings, we calculated intraclass correlation (*ICC*) statistics to assess inter-rater reliability between each trained independent observer and the consensus ratings. We set a threshold of a mean *ICC* of .80 to determine whether a trained independent observer successfully passed the training stage. All trained independent observers passed our criterion *ICC*, and following training, these observers coded the cases in the sample to which they were assigned.

Independent observers made global ratings of each adolescent's social skills, based on observations of the SSIT (five ratings; $M = 3.65$; $SD = 0.83$), UCT (one rating; $M = 2.99$; $SD = 1.31$), and IST (one rating; $M = 3.66$; $SD = 0.99$), using an extensively validated behavioral coding scheme (e.g., Glenn et al. 2019). Ratings were made on a 5-point scale ranging from 1 (*Not effective at all*) to 5 (*Very effective*), where higher scores indicated greater social skills.

Independent observers made ratings for 105 adolescents in the sample, and prior work indicates that these 105 adolescents did not differ from the total sample on demographic characteristics (Makol et al., 2020). The *ICC*'s (for average measures) testing inter-rater reliability for independent observers' ratings displayed an average *ICC*(1,2) of .82. This average *ICC* is considered within the "excellent" range, based on thresholds recommended by Cicchetti (1994).

Survey Measures

Across adolescent participants, their parents, peer confederates, and UUOs, surveys focused on assessing adolescent social anxiety, safety behaviors, and psychosocial impairment. Parents also completed a demographics form to collect the adolescent, parent, and family demographic information described previously. Across survey measures, we held all item content constant, with minor modifications to fit each informant's perspective (e.g., *"I"* for adolescents; *"my child"* for parents; *"the participant"* for peer confederates and UUOs).

Social Anxiety (Social Interaction Anxiety Scale [SIAS])

The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) is a 20-item scale designed to assess social anxiety symptoms while interacting with others (e.g., *"I am unsure whether to greet someone I know only slightly"* and *"I feel I'll say something embarrassing when talking."*). Informants (i.e., adolescents, parents, peer confederates) rated each statement on a 5-point Likert scale ranging from 0 *(Not at all characteristic or true of me*) to 4 (*Extremely characteristic or true of me*). When used to assess adolescents, informants' reports on the SIAS display high levels of internal consistency ($\alpha > .90$) and distinguish adolescents on referral status (Cohen's *d*s ranging from 0.55 to 1.25; Deros et al., 2018). Further, informants' SIAS reports relate to observed social skills (Pearson *r*s ranging from -.17 to -.55; Glenn et al., 2019).

Safety Behaviors (Subtle Avoidance Frequency Examination [SAFE])

To assess safety behaviors, we administered the SAFE (Cuming et al., 2009) to adolescents, parents, and UUOs. Each of the 32 items describes a safety-seeking behavior that could be employed in the context of a social interaction (e.g., *"Position yourself/themself so as not to be noticed"* and *"Before you/they arrive, excessively rehearse what you/they might say or how you/they will behave."*). The frequency of each safety behavior was indicated using a 5-point scale ranging from 1 (*Never*) to 5 (*Always*). When used to assess adolescents, informants' reports on the SAFE display high levels of internal consistency ($\alpha > .80$), and distinguish adolescents on referral status (Cohen's *d*s ranging from 0.57 to 0.77; Qasmieh et al., 2018; Thomas et al., 2012). Further, informants' SIAS reports relate to observed social skills (Pearson *r*s in -.30s; Rezeppa et al., 2021).

Psychosocial Impairments (Work and Social Adjustment Scales for Youth [WSASY])

We administered the WSASY (De Los Reyes et al., 2019) to adolescents and parents to assess adolescents' psychological impairments. The WSASY consists of five items assessing the adolescent's behavior without mention of mental health concerns or status (e.g., "*Because of the ways I think, feel or behave, my ability to do well in school is impaired."*). The severity of the impairment is indicated using a 8-point scale from 0 (*Not at all*) to 8 (*Very severely*). The sum of the scores range from 0 to 40, with higher scores indicating greater impairments. Parents' and adolescents' reports on the WSASY display high levels of internal consistency ($\alpha > .80$), distinguish adolescents on number of peer-related impairments (Cohen's *d*s ranging from 0.54 to 0.71), and relate to observed social skills (Pearson *r*s in -.20s; De Los Reyes et al., 2019).

Peer-Related Impairments Screening

During a preliminary phone screening, we asked parents to provide reports on three peer-related impairment items from the Anxiety Disorders Interview Schedule for Children and Adolescents (ADIS-C/A; Silverman & Albano, 1996). The items administered included (a) *Would you say your child has more friends/fewer friends/same number as most kids?* (response options: more friends, same number of friends, or fewer friends relative to same-age peers); (b) *Do you think your child has trouble making friends?* (response options: yes or no); (c) *Once your child has made friends, do you think he/she has trouble keeping them?* (response options: yes or no). This screening distinguishes adolescents on referral status (Cramer's $V = .68$) and clinical elevations on symptom measures of social anxiety, depression, and attention-deficit/hyperactivity disorder (Odds ratios ranging from 2.39 to 3.68; Beale et al., 2018).

Fears of Negative and Positive Evaluation

Brief Fear of Negative Evaluation Scale (BFNE; Leary, 1983). The BFNE measures fears of negative evaluation from others. We administered the BFNE to adolescents and their parents. The BFNE consists of 12 items rated on a 5-point scale ranging from 1 (*not at all characteristic of me*) to 5 (*extremely characteristic of me*). Items include statements like, "*I am frequently afraid of other people noticing my shortcomings*" and four reverse coded statements including, "*Other people's opinions of me do not bother me.*" Parents' and adolescents' BFNE reports display high levels of internal consistency ($\alpha > .80$) and distinguish adolescents on referral status (Cohen's *d*s ranging from 0.44 to 0.57; Karp et al., 2018).

Fear of Positive Evaluation Scale (FPES; Weeks et al., 2008). We administered the FPES to both adolescents and parents: a 10-item scale of fears of positive evaluation from others (e.g., *"I am uncomfortable exhibiting my talents to others, even if I think my talents will impress*

them." and *"I feel uneasy when I receive praise from authority figures."*). There are two reverse-scored items that are not used to calculate the total score. Informants provide ratings on a scale ranging from 0 (*Not at all true*) to 9 (*Very true*). Parents' and adolescents' FPES reports display high levels of internal consistency ($\alpha > .80$) and distinguish adolescents on referral status (Cohen's *d*s ranging from 0.32 to 0.64; Karp et al., 2018).

Data-Analytic Plan

Computing Descriptive and Reliability Statistics

We followed a four-step plan for addressing our aims. First, each of our instruments consisted of either multi-item survey measures of unidimensional constructs or ratings of adolescent behavior for which we calculated composite scores (i.e., of two independent observers' ratings for each adolescent). Thus, consistent with prior work using these instruments (e.g., Deros et al., 2018; Glenn et al., 2019; Qasmieh et al., 2018; Thomas et al., 2012), and to produce estimates to compare against prior work, we assessed the reliability of these instruments by calculating estimates of either internal consistency (Cronbach's α for survey measures) or inter-rater reliability (*ICC*s for independent observers' ratings). We interpreted these calculations relative to conventions for α (e.g., Nunnally & Bernstein, 1994) and *ICC*s (e.g., Cicchetti, 1994). We then computed means and standard deviations for all continuous measures, and calculated statistics for skewness and kurtosis to determine if our data met assumptions for our planned parametric analyses (i.e., skewness/kurtosis in range of ±2.0; Tabachnick & Fidell, 2001). We reported these statistics in Table 1. In Table 2, we report bivariate correlations among safety behaviors and social anxiety measures and criterion variables used in tests of our hypotheses.

Integrating Multi-Informant Assessments of Safety Behaviors and Social Anxiety

As mentioned previously, we leveraged a multi-informant approach to assessing safety behaviors and social anxiety that included reports completed by adolescents, parents, peer confederates, and UUOs. As in other areas of multi-informant assessment (for a review, see De Los Reyes, 2011), SIAS and SAFE reports from these informants commonly yield discrepant estimates (e.g., Deros et al., 2018; Qasmieh et al., 2018; Rezeppa et al., 2021). To optimize prediction of criterion variables using these discrepant data, we leveraged an integrative approach developed by Kraemer and colleagues (2003) that involves repurposing a long-used data aggregation technique for analyzing variations among survey items—principal components analysis (PCA; Nunnally & Bernstein, 1994)—to instead model multi-informant data. This approach involves synthesizing informants' reports into sources of variability informed by prior work (see Achenbach et al., 1987; De Los Reyes et al., 2013a, 2015). First, *context* variation reflects the environment in which the informant observes the youth about whom they make ratings. Second, *perspective* variation reflects whether the report comes from an observer or self-rater. Third, *trait* variation reflects concerns that manifest across informants' contexts and perspectives. The following mathematical equation represents this approach:

$$Informant's\ Rating = Trait + Context + Perspective$$

Using PCA, we identified the three sources of variability reflected in this equation by examining component weights, consistent with Kraemer and colleagues. As mentioned previously, we used a set of informants who collectively varied in their contexts and perspectives, with (a) informants observing from a home-based, observer perspective (parents); (b) informants observing from a non-home-based, observer perspective (peer confederates, UUOs); and (c) informants observing from a self-perspective and based on a mix of home and non-home contexts. As such, we

expected our PCA to include a *Trait* score component in which all informants' reports load strongly and in the same direction. We also expected our PCA to reveal a *Context* score (i.e., informants from different contexts load in opposite directions) as well as a *Perspective* score (i.e., self-reports load in the opposite direction of observer informants' reports).

Consistent with Kraemer and colleagues (2003) and recent work by Makol and colleagues (2020), we conducted two unrotated PCAs, one for the three "SAFE items" (i.e., the total scores of parent, adolescent, and UUO SAFE reports) and another for the three "SIAS items" (i.e., the total scores of parent, adolescent, and peer confederate SIAS reports). In this respect, our subject-to-item ratio (i.e., 134/3 = 44.67:1) is well above the typical subject-to-item ratios deemed "large" within PCA modeling contexts (e.g., 20:1; see Osborne & Costello, 2004). Within these unrotated PCAs, we set the number of components to be extracted to three. We examined principal component weights for each informant's report to determine whether we identified trait, context, and perspective scores described previously (Table 3). Makol and colleagues found that the *Trait* score yielded optimal prediction of criterion variables, an observation consistent with Kraemer and colleagues' notions as to the value of this approach. Thus, we used the SAFE and SIAS *Trait* scores for tests of our hypotheses. We also computed bivariate correlations among all informants' reports on these measures.

Classifying Individual Differences in Levels of Safety Behaviors and Social Anxiety

To classify adolescents on levels of safety behaviors and social anxiety, we followed an approach used in recent work on individual differences in anxiety-related processes (e.g., Lipton et al., 2016; Szollos et al., 2019). Specifically, we first classified groups of individuals who were high versus low in safety behaviors and social anxiety by creating median splits of participants' SAFE and SIAS *Trait* scores (i.e., 1 = above median, 0 = below median). As in Lipton et al.

(2016) and Szollos et al. (2019), we considered examining these constructs continuously; however, our SAFE and SIAS *Trait* scores displayed relatively high correlations in the present study and thus high multicollinearity, $r = .74$, $p < .001$. Consequently, entering both measures as independent variables in a model would likely reduce statistical power (Cohen et al., 2013). Thus, our approach produced an optimal index for individual differences in levels of safety behaviors and social anxiety. That is, we collapsed these two variables into a single variable that represented four different groups; namely, individuals who were: (a) low in safety behaviors and low in social anxiety (i.e., Low SAFE/Low SIAS), (b) high in social anxiety and low in safety behaviors (i.e., High SIAS/Low SAFE), (c) low in social anxiety and high in safety behaviors (i.e., Low SIAS/High SAFE), and (d) high in safety behaviors and high in social anxiety (i.e., High SAFE/High SIAS). This grouping variable served as the key predictor in tests of our main hypotheses, and we report the frequencies of these groups in Table 4. In light of its relevance to addressing our study aims, we also calculated a series of one-way analyses of variance (ANOVAs) to compare the groups on mean levels of the SAFE and SIAS *Trait* scores used to create the groups. These tests essentially provided a means to validate the approach we took to creating these groups. In particular, these ANOVAs addressed the question of whether the groups accurately reflected the underlying continuous data from which we created the groups.

Links between Levels of Safety Behaviors and Social Anxiety and Criterion Variables

Observed Social Skills. To test links between individual differences in levels of safety behaviors and social anxiety and independent observers' ratings of adolescent social skills, we used generalized estimating equations (GEE). The GEE framework allowed us to treat observers' ratings across the multiple social situations as a repeated-measures variable (Hanley et al., 2003). In capitalizing on the dependent data structure underlying our criterion variable, using GEE

allowed us to boost our effective sample size and thus statistical power to detect effects. For GEE modeling, we used an identity link function with an unstructured correlation matrix, given the small number of dependent variables. In this GEE model, independent observers' ratings served as a nested, repeated-measures (within social context) dependent variable, and we modeled the dependent variable as a function of two factors. We entered a within-subjects Social Context factor (coded SSIT, UCT, and IST), and a between-subjects Safety Behaviors/Social Anxiety Group factor reflecting the four groups described previously (coded Low SAFE/Low SIAS, High SIAS/Low SAFE, Low SIAS/High SAFE, and High SAFE/High SIAS). As in prior work (e.g., Alfano et al., 2015; De Los Reyes et al., 2013b; Lipton et al., 2014), we estimated magnitudes of effects for these factors by calculating pseudo-R^2 figures. Specifically, we divided each Wald χ^2 estimate by the summation of all estimates in the GEE model. Further, we sought to examine differences in adolescents' social skills between the High SAFE/High SIAS group and other groups. Thus, in the presence of significant between-subjects effects, we conducted follow-up univariate contrasts for differences in adolescent social skills for High SAFE/High SIAS vs.: (a) Low SAFE/Low SIAS, (b) High SIAS/Low SAFE, and (c) Low SIAS/High SAFE.

Survey Measures of Psychosocial Impairments and Fears of Evaluation. To test links between individual differences in levels of safety behaviors and social anxiety and survey measures of psychosocial impairments and fears of evaluation, we constructed a series of GEE models. For these GEE models, we assumed a normal distribution of the dependent variables, and used an identity link function with an unstructured correlation matrix, again given the small number of dependent variables. We ran three models (i.e., one each for the WSASY, BFNE, and FPES) with informants' reports on these domains modeled as a nested, repeated-measures (i.e., within adolescent-parent dyad) dependent variable. We modeled the dependent variable as a

function of two factors. We entered a within-subjects Informant factor (coded parent, then adolescent), and the between-subjects Safety Behaviors/Social Anxiety factor described previously. We estimated magnitudes of effects using the pseudo-R^2 procedure described previously, and in the presence of significant between-subjects effects, we conducted the follow-up univariate contrasts described previously for our tests of adolescents' social skills, except this time our focus was on differences in levels of psychosocial impairments and/or evaluative fears.

Peer-Related Impairments Screening. To test links between levels of safety behaviors and social anxiety and peer-related impairments, we leveraged a non-parametric technique, namely chi square (χ^2). We used this technique in light of the discrete or ordinal scaling for both indices. We interpreted magnitudes of effects based on the Cramer's *V* statistic and interpretative conventions for this metric based on six degrees of freedom (i.e., Gravetter & Wallnau, 2013).

Results

Preliminary Analyses

We report in Table 1 means, standard deviations, and internal consistency estimates for all survey measures. All survey measures displayed excellent internal consistency (i.e., all αs ≥ .84). Further, all survey and behavioral measures displayed acceptable levels of skewness and kurtosis (i.e., scores < ±2.0). We report in Table 2 bivariate correlations between the multi-informant measures of safety behaviors and social anxiety used to construct our key predictor variable (i.e., individual differences in levels of safety behaviors and social anxiety) and criterion measures (i.e., measures of social skills, psychosocial impairments, and evaluative fears.

We computed bivariate correlations to examine associations within and among multi-informant safety behaviors and social anxiety measures used in our study. On the SAFE, the patterns of parent-adolescent (.33, $p < .001$), UUO-adolescent (.22, $p < .05$), and parent-UUO

(-.04, p = .63) correlations were consistent with prior work (e.g., Qasmieh et al., 2018; Rezeppa et al., 2021). Similarly, on the SIAS, the patterns of parent-adolescent (.39, p < .001), peer confederate-adolescent (.42, p < .001), and parent-peer confederate (.30, p < .001) correlations were consistent with prior work (e.g., Deros et al., 2018; Glenn et al., 2019). Taken together, we observed small- to moderate-magnitude multi-informant correlations, consistent with the idea that informants reported about the adolescent from varying contexts and perspectives. In fact, in Table 3, we report the results of the PCAs we used to integrate multi-informant data on the SAFE and SIAS. Consistent with prior work (e.g., Kraemer et al., 2003; Makol et al., 2020), these PCA models each revealed factors consistent with the *Trait*, *Context*, and *Perspective* scores as described previously. These preliminary analyses support our approach to integrating multi-informant data to address our study aims.

Individual Differences in Levels of Safety Behaviors and Social Anxiety

In Table 4, we report the groups reflecting our measure of individual differences in levels of safety behaviors and social anxiety. As expected, we observed four groups reflecting these individual differences: Low SAFE/Low SIAS, High SIAS/Low SAFE, Low SIAS/High SAFE, and High SAFE/High SIAS. Importantly, these groups validly reflected the underlying continuous data from which we created them, namely the SAFE and SIAS *Trait* scores. Specifically, ANOVAs revealed a significant omnibus effect of these groups for both the SAFE *Trait* score (F[3, 128] = 86.25; p < .001) and SIAS *Trait* score (F[3, 128] = 84.60; p < .001). Follow-up univariate contrasts using Dunnett's $T3$ tests (i.e., to account for inequality of variances) revealed group differences in the expected directions. For instance, the High SAFE/High SIAS group evidenced significantly higher *Trait* scores for both the SAFE and SIAS, relative to all other groups, all ps < .001. Further, the High SIAS/Low SAFE group

evidenced a significantly higher SIAS *Trait* score, relative to the Low SIAS/High SAFE and Low SAFE/Low SIAS groups, both *p*s < .001. Similarly, the Low SIAS/High SAFE group evidenced a significantly higher SAFE *Trait* score, relative to the High SIAS/Low SAFE and Low SAFE/Low SIAS groups, both *p*s < .001. Crucially, we also observed non-significant differences between the Low SAFE/Low SIAS groups and both the High SIAS/Low SAFE group on the SAFE *Trait* score ($p = .88$) and the Low SIAS/High SAFE group on the SIAS *Trait* score ($p = .60$). These analyses support the notion that these groups accurately reflected the underlying continuous data used to create the groups (i.e., the SIAS and SAFE *Trait* scores). Thus, these analyses support our use of this approach to address our study aims.

Relations with Observed Social Skills

GEE analysis revealed significant effects for both context (Wald $\chi^2 = 45.45$; pseudo-R^2 = 58.13%; $p < .001$) and group (Wald $\chi^2 = 32.74$; pseudo-$R^2 = 41.87\%$; $p < .001$). Consistent with prior work (Glenn et al., 2019), the context effect reflected adolescents displaying significantly lower observed social skills during the UCT, relative to both the SSIT (estimated marginal means [*EMM*s] = 3.01 vs. 3.69; $p < .001$) and IST (*EMM*s = 3.01 vs. 3.70; $p < .001$). Consistent with our hypotheses, the significant group effect reflected adolescents in the High SIAS/High SAFE group displaying significantly lower observed social skills, relative to adolescents in the High SIAS/Low SAFE (*EMM*s = 2.89 vs. 3.35; $p < .05$), Low SIAS/High SAFE (*EMM*s = 2.89 vs. 3.73; $p < .001$), and Low SAFE/Low SIAS (*EMM*s = 2.89 vs. 3.89; $p < .001$) groups.

Relations with Survey Measures of Psychosocial Impairments and Fears of Evaluation

WSASY. GEE analysis revealed a non-significant informant effect (Wald $\chi^2 = 1.93$; pseudo-$R^2 = 4.56\%$; $p = .16$) and a significant group effect (Wald $\chi^2 = 40.39$; pseudo-R^2 = 95.44%; $p < .001$). Consistent with our hypotheses, the significant group effect reflected

adolescents in the High SIAS/High SAFE group displaying significantly greater WSASY scores, relative to adolescents in the High SIAS/Low SAFE (*EMM*s = 13.44 vs. 8.14; $p < .001$), Low SIAS/High SAFE (*EMM*s = 13.44 vs. 7.50; $p < .001$), and Low SAFE/Low SIAS (*EMM*s = 13.44 vs. 6.46; $p < .001$) groups.

BFNE. GEE analysis revealed a non-significant informant effect (Wald $\chi^2 = 0.08$; pseudo-$R^2 = 0.17\%$; $p = .78$) and a significant group effect (Wald $\chi^2 = 46.25$; pseudo-$R^2 = 99.83\%$; $p < .001$). Consistent with our hypotheses, the significant group effect reflected adolescents in the High SIAS/High SAFE group displaying significantly greater BFNE scores, relative to adolescents in the High SIAS/Low SAFE (*EMM*s = 39.63 vs. 32.75; $p < .001$), Low SIAS/High SAFE (*EMM*s = 39.63 vs. 33.53; $p < .01$), and Low SAFE/Low SIAS (*EMM*s = 39.63 vs. 30.38; $p < .001$) groups.

FPES. GEE analysis revealed a non-significant informant effect (Wald $\chi^2 = 2.04$; pseudo-$R^2 = 3.01\%$; $p = .15$) and a significant group effect (Wald $\chi^2 = 65.73$; pseudo-$R^2 = 96.99\%$; $p < .001$). Consistent with our hypotheses, the significant group effect reflected adolescents in the High SIAS/High SAFE group displaying significantly greater FPES scores, relative to adolescents in the High SIAS/Low SAFE (*EMM*s = 33.18 vs. 20.19; $p < .001$), Low SIAS/High SAFE (*EMM*s = 33.18 vs. 22.47; $p < .001$), and Low SAFE/Low SIAS (*EMM*s = 33.18 vs. 17.17; $p < .001$) groups.

Relations with Peer-Related Impairments

We report in Table 4 the data we used to test links between levels of safety behaviors and social anxiety and peer-related impairments. A χ^2 test of these data revealed a significant, large-magnitude effect, $\chi^2(6) = 18.54$; $p < .01$; Cramer's $V = .27$. Table 4 also includes adjusted standardized residuals (ASRs), which function much like *z*-scores and thus help us interpret the

nature of these effects (for further information on interpreting ASRs, see Haberman, 1978). Consistent with findings reported previously, the High SAFE/High SIAS group was particularly likely to evidence two or more peer-related impairments (ASR = 3), an ASR higher than any other group for this level of peer-related impairments. In contrast, the Low SAFE/Low SIAS group was particularly likely to evidence zero peer-related impairments (ASR = 3.2), again an ASR higher than any other group for this level of peer-related impairments.

Discussion

Main Findings

Leveraging the latest approaches to integrating multi-informant assessments of adolescent social anxiety (Kraemer et al., 2003; Makol et al., 2020), and an innovative behavioral paradigm to simulate interpersonal interactions with unfamiliar, same-age peers (Unfamiliar Peer Paradigm; Cannon et al., 2020), we conducted a study that significantly advanced the literature on links between safety behaviors and functional impairments among socially anxious youth. In a mixed clinical/community sample of adolescents, we observed two key findings. First, adolescents who displayed relatively high levels of both safety behaviors and social anxiety displayed the lowest social skills when interacting with unfamiliar peer confederates, relative to all other adolescents in the sample. Second, the observation of adolescents who displayed relatively high levels of both safety behaviors and social anxiety exhibiting greater levels of functional impairments extended to other impairment domains. These domains included direct survey assessments of psychosocial impairments, survey assessments of evaluative fears that commonly result in impairments (i.e., fears of positive and negative evaluation), and screening assessments of peer-related impairments. Taken together, the findings indicate that assessments of adolescent safety behaviors hold incremental value for

understanding functional impairments linked to adolescent social anxiety, above-and-beyond merely assessing their social anxiety symptoms.

Implications for Research and Practice

Our findings have important implications for research on safety behaviors in social anxiety. In terms of research implications, prior work that has tested links between safety behaviors and functional impairments among socially anxious individuals has largely focused on adults (Piccirillo et al., 2016). Our findings both extend these links to adolescents and highlight key aspects of conducting research on these issues with adolescents to inform future work in this developmental period. Indeed, we demonstrated the value of studying these links within social interactions germane to adolescents' clinical presentations, namely interactions with unfamiliar peers. Further, our findings highlight the value of not only taking a multi-informant approach to assessing adolescent safety behaviors and social anxiety, but also leveraging analytic procedures that capitalize on the unique value of each of these informants' reports. In particular, understanding links between safety behaviors and functional impairments among socially anxious adolescents likely requires paradigms to integrate data from not only adolescents, but also informants who vary in their familiarity to the adolescent (e.g., parents vs. unfamiliar peer confederates and unfamiliar observers) and the contexts in which they observe the adolescent (e.g., home vs. peer interactions). In this respect, our findings might also inform future research seeking to develop innovative paradigms for integrating multi-informant assessments of anxiety-related processes beyond safety behaviors (e.g., depressive symptoms).

In terms of implications for practice, a key element of our study is that we used short, clinically feasible survey measures of adolescent safety behaviors and social anxiety based on widely used measures with adults (i.e., SAFE and SIAS; Cuming et al., 2009; Mattick & Clarke,

1998). These widely used survey measures may assist in identifying socially anxious individuals who not only display safety behaviors, but also may be at risk of experiencing particularly severe functional impairments. Indeed, within exposure-based therapies, youth clients who use safety behaviors during therapeutic exposures fare worse in therapy than those clients who do not use these behaviors (e.g., Hedtke et al., 2009). Further, within cognitive-behavioral therapies for anxiety generally, youth diagnosed with social anxiety disorder tend to display slower rates of therapeutic change and diagnostic outcomes, relative to youth diagnosed with other anxiety disorders (Hudson et al., 2015). This work signals that, clinically, a conjunctive strategy of survey measures of both safety behaviors and social anxiety may assist in treatment planning. In particular, these measures may assist in detecting those clients who may be at risk of experiencing poor responses to exposure-based and/or cognitive-behavioral therapies. As evidence of the clinical implications of these findings, consider that the key group of interest in our sample (i.e., high on both safety behaviors and social anxiety) comprised a relatively large proportion of our sample (see Table 4). As such, these issues merit further study.

Limitations and Future Directions

The limitations of our study highlight directions for future research. A key aim of this study involved testing links between adolescent safety behaviors and social anxiety in the context of interpersonal functioning when interacting with unfamiliar peers. Importantly, the unfamiliar peer confederates with whom adolescents interacted in the Unfamiliar Peer Paradigm were undergraduate and post-baccalaureate personnel who we trained to simulate unfamiliar, same-age peers. Consistent with prior work (Cannon et al., 2020; Deros et al., 2018), we only leveraged the assistance of personnel who appeared youthful and could reasonably appear to adolescents as same-age, unfamiliar peers (e.g., wearing age-appropriate casual clothing, no

facial hair for male confederates). Yet, peer confederates were a different age relative to our study participants. Further, we did not examine the degree to which adolescents believed that these confederates were their own age. Importantly, in prior work, we learned that adolescents' reactions to unfamiliar peer confederates within this paradigm predict their reactions to a well-established task where they are (a) told explicitly that they would be interacting with same-age, unfamiliar peers; and (b) provided with photographic stimuli to support this element of the task (i.e., Cyberball; see Karp et al., 2018). Nevertheless, we cannot be certain that adolescents' reactions to the Unfamiliar Peer Paradigm would have been identical to their reactions to interactions with same-age, unfamiliar peers in general. Further, we recruited participants within a fairly limited age range of 14–15 year olds. Thus, our findings might not generalize to adolescents within earlier and later developmental periods. In these respects, future research should examine the generalizability of the findings when using age-matched adolescents as peer confederates, and within samples of older and younger adolescents.

Concluding Comments

Covert avoidance strategies (i.e., safety behaviors) play a crucial role in the development and maintenance of adolescent social anxiety. Prior work with adults links these safety behaviors to increased functional impairments among socially anxious individuals who use them. Yet, we know little about whether these links generalize to adolescents and how they react to key contexts in their social worlds, namely interactions with same-age, unfamiliar peers. This is an important gap in the literature given how crucially these social situations factor into adolescent clients' clinical presentations and thus the delivery of evidence-based psychosocial interventions for social anxiety (i.e., exposure-based therapies; Alfano & Beidel, 2011). In this study, we learned that we could leverage a short, clinically feasible multi-informant battery of survey

measures of safety behaviors and social anxiety to identify individual differences in levels of adolescent safety behaviors and social anxiety. Adolescents with relatively high scores on measures of both safety behaviors and social anxiety experienced the greatest functional impairments. We observed these relations using a multi-modal battery of criterion measures reflecting multiple domains of functional impairment (i.e., social skills, psychosocial impairments, evaluative fears; Cannon et al., 2020; De Los Reyes et al., 2019; Karp et al., 2018). These findings have important implications and open doors to new research directions. It appears that safety behaviors hold incremental value in understanding the functional impairments experienced by socially anxious adolescents. In these respects, we encourage future research that tests whether multi-informant reports about adolescent safety behaviors and social anxiety usefully inform screening and treatment planning assessments relevant to adolescent clients.

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Table 1

Means (M), Standard Deviations (SD), and Internal Consistency Estimates (α) of Survey Measures

Variable	*M*	*SD*	α
Subtle Avoidance Frequency Examination			
Adolescent Self-Report	66.19	20.24	.93
Parent Report about Adolescent	64.74	17.43	.92
Unfamiliar Untrained Observer	77.02	18.29	.91
Social Interaction Anxiety Scale			
Adolescent Self-Report	28.04	16.14	.93
Parent Report about Adolescent	27.04	16.54	.95
Peer Confederate [a]	35.55	17.51	.96
Work and Social Adjustment Scale for Youth			
Adolescent Self-Report	10.07	8.07	.85
Parent Report about Adolescent	8.84	7.71	.84
Brief Fear of Negative Evaluation			
Adolescent Self-Report	34.81	9.18	.87
Parent Report about Adolescent	34.40	9.69	.90
Fear of Positive Evaluation Scale			
Adolescent Self-Report	25.49	15.40	.85
Parent Report about Adolescent	22.98	15.72	.87

Notes. [a] Estimates for peer confederates' reports based on 132 reports.

Table 2

Bivariate Correlations among Multi-Informant Survey Measures of Safety Behaviors and Social Anxiety and Criterion Measures

Variable	**SSIT Social Skills** [b]	**UCT Social Skills** [b]	**IST Social Skills** [c]	**WSASY (Adolescent/Parent)**	**BFNE (Adolescent/Parent)**	**FPES (Adolescent/Parent)**
Subtle Avoidance Frequency Examination						
Adolescent	-.33**	-.38***	-.26**	.49***/.17*	.62***/.24**	.69***/.21*
Parent	-.17	-.17	-.14	.20*/.51***	.26**/.49***	.23**/.65***
Unfamiliar Untrained Observer	-.27**	-.43***	-.22*	.19*/-.04	.22*/.10	.28**/-.07
Trait Score	-.36***	-.44***	-.29**	.46***/.35***	.58***/.43***	.62***/.44***
Social Interaction Anxiety Scale						
Adolescent	-.33***	-.37***	-.19	.44***/.16	.72***/.28**	.76***/.19*
Parent	-.33**	-.31**	-.20*	.21*/.56***	.31***/.65***	.28**/.74***
Peer Confederate [a]	-.49***	-.56***	-.41***	.25**/.20*	.25**/.18*	.34***/.07
Trait Score [a]	-.51***	-.56***	-.36***	.40***/.39***	.58***/.48***	.62***/.43***

Note. **SSIT** = Simulated Social Interaction Test; **UCT** = Unstructured Conversation Task; **IST** = Impromptu Speech Task; **WSASY** = Work and Social Adjustment Scale for Youth; **BFNE** = Brief Fear of Negative Evaluation scale; **FPES** = Fear of Positive Evaluation Scale. [a] Estimates for peer confederates' reports based on 132 reports, and thus we based *Trait* score estimates on data about 132 adolescents. [b] Estimates for trained, independent observers' ratings based on observations of 105 adolescents on the Simulated Social Interaction Test and Unstructured Conversation Task. [d] Estimates for trained, independent observers' ratings based on observations of 102 adolescents on the Impromptu Speech Task, given that three adolescents declined to give a speech. *$p < .05$; **$p < .01$; ***$p < .001$.

Table 3

Principal-Component Analysis (PCA) of Multi-Informant Reports on the Subtle Avoidance Frequency Examination (SAFE) and on the Social Interaction Anxiety Scale (SIAS)

Informant	Trait	Context	Perspective	Sources of Variability in Informant's Report
SAFE (*n* = 134)	**Component Weight**			
Parent	0.70	- 0.56	0.45	Home (context), Other (perspective)
Adolescent	0.85	0.04	-0.53	Home and Non-home (context), Self (perspective)
Unfamiliar Untrained Observer	0.41	0.85	0.32	Non-home (context), Other (perspective)
Eigenvalue	1.38	1.04	0.58	
Variance attributable to component	45.98%	34.60%	19.43%	
SIAS (*n* = 132)	**Component Weight**			
Parent	0.73	0.63	0.27	Home (context), Other (perspective)
Adolescent	0.81	-0.06	-0.59	Home and Non-home (context), Self (perspective)
Peer Confederate	0.75	-0.55	0.37	Non-home (context), Other (perspective)
Eigenvalue	1.75	0.70	0.56	
Variance attributable to component	58.24%	23.25%	18.52%	

Note. PCA conducted with participants for whom we had full data across informants' SAFE (parent, adolescent, and unfamiliar untrained observers; *n* = 134) and SIAS (parent, adolescent, and peer confederate; *n* = 132) reports. Kraemer et al. (2003) described the following criteria for each component: *Trait* (all three informants' reports load strongly and in the same direction), *Context* (informants from different contexts load in opposite directions) and *Perspective* (self-reports load in the opposite direction of observer informants' reports).

Table 4

Means (M) and Standard Deviations (SD) of Continuous Scores for the Safety Behaviors and Social Anxiety Groups and Links to Peer-Related Impairments (N = 132)

Group	**SAFE *Trait* Score *M***	**SAFE *Trait* Score *SD***	***SIAS* *Trait* Score *M***	**SIAS *Trait* Score *SD***	***N* (%) With "0" Peer-Related Impairments** [a]	***N* (%) With "1" Peer-Related Impairment**	***N* (%) With "2 or More" Peer-Related Impairments**
Low SAFE/Low SIAS (*n* = 49)	-0.82	0.41	-0.81	0.45	33/48 (68.8%; 26.4%) ASR = 3.2	7/48 (14.6%; 5.6%) ASR = -1	8/48 (16.7%; 6.4%) ASR = -2.6
High SIAS/Low SAFE (*n* = 18)	-0.68	0.52	0.19	0.34	5/17 (29.4%; 4%) ASR = -1.9	5/17 (29.4%; 4%) ASR = 1.2	7/17 (41.2%; 5.6%) ASR = 1
Low SIAS/High SAFE (*n* = 17)	0.28	0.38	-0.64	0.41	10/15 (66.7%; 8%) ASR = 1.3	3/15 (20%; 2.4%) ASR = 0.1	2/15 (13.3%; 1.6) ASR = -1.5
High SAFE/High SIAS (*n* = 48)	0.98	0.78	0.99	0.79	15/45 (33.3%; 12%) ASR = -2.9	9/45 (20%; 7.2%) ASR = 0.2	21/45 (46.7%; 16.8%) ASR = 3

Note. **SAFE** = Subtle Avoidance Frequency Examination; **SIAS** = Social Interaction Anxiety Scale; **ASR** = Adjusted standardized residuals: The residual for a cell (observed minus expected value) divided by an estimate of its standard error. The resulting standardized residual is expressed in standard deviation units above or below the mean. [a] Estimates for peer-related impairments based on observations of 125 adolescents; frequencies and percentages for peer-related impairments based on total number of members within group, followed by total sample percentage.