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Ambiguous situations make me anxious: Personality traits and initiating social interaction

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Abstract

Social interaction is important for human health and happiness, yet it may be in decline. The current study aimed to determine traits that predict social interaction. Participants (N = 30) responded to surveys measuring Need for Cognitive Closure (NFCC), social anxiety, Intolerance for Uncertainty (IU), and the Big Five personality traits. A structured lab observation was used to determine if participants would interact with a confederate and their preferred physical distance from the confederate. Only 20% of all participants interacted with a confederate. Predictors of social interaction included higher scores in the Big Five personality trait of openness and lower IU scores. No factors were related to physical distance preference. NFCC, social anxiety, and IU were all positively correlated. Overall, it seems that less fear of the unknown was one of the biggest factors involved in interaction with a stranger. We suggest that therapies for those with social anxiety that focus on eliminating fear of ambiguity may have more success, resulting in decreased loneliness and improved well-being.

Keywords: social anxiety, social interaction, Need for Cognitive Closure, Intolerance of Uncertainty, personality

Ambiguous Situations Make Me Anxious: Personality Traits and Initiating Social Interaction

Loneliness affects both mental and physical health. In 2020, 36% of American adults surveyed online (*N* = 935, 41% male, 7% Black, 77% White), felt serious loneliness (Harvard, 2021). Young adults aged 18-25 made up 61% of this sample, and 43% of them reported an increase in loneliness since the start of the COVID-19 pandemic. Additionally, 63% of these young adults reported experiencing symptoms of anxiety or depression (Harvard, 2021). Loneliness, a symptom of social isolation, increased during the COVID-19 pandemic (Ernst et al., 2022) and has been found to negatively affect health (Cené et al., 2022). For example, in adults over 50, social isolation was correlated with an increased risk of dementia, heart disease, stroke, and premature death from all causes (CDC, 2021). In a review of the literature, Holt-Lunstad and colleagues (2010) concluded the absence of social relationships has an influence on mortality that was comparable, in terms of impact, to behaviors like smoking or drinking alcohol. On the other hand, social interaction, even with strangers, increases well-being (Gunaydin et al., 2021). This is true even for individuals with social anxiety disorder (SAD) who are less likely to notice the benefits of said interactions (Goodman et al., 2021). Unfortunately, if a person with SAD does not perceive the rewards of social interaction, they may be less likely to initiate future interactions, which may in turn increase the risk of anxiety and depression.

The health of people with SAD may be particularly impacted by loneliness. SAD and alcohol use disorder are often comorbid (Kessler et al., 1997). Additionally, Buckner and Schmidt (2009) suggested that social anxiety precedes the onset of alcohol use disorder for most people. Furthermore, individuals with SAD tend to engage in more illicit drug use and risk-taking, which, as researchers suggest, is likely due to feeling the need to regulate their emotions

(Kashdan et al., 2006). Grant et al. (2005) also found that SAD was positively correlated with other psychological disorders and that 80% of their sample had received no treatment for their disorders. In summary, when individuals do not socialize, the effects are detrimental to both physical and mental health, and some believe it should be considered a public health priority (Holt-Lunstad et al., 2017).

When a certain amount of social interaction is expected and not fulfilled, isolation can elicit a craving for interaction that is similar to the way a person craves food when hungry (Tomova et al., 2020). However, social anxiety, which can be experienced by anyone and is not limited to those with SAD, was related to perceiving intimacy as risky, thus hindering people's willingness to develop intimate relationships (Porter & Chambless, 2013). Although social anxiety can be detrimental to romantic relationship satisfaction (Kashdan et al., 2013; Porter & Chambless, 2013), romantic relationship longevity over time (Kashdan et al., 2013), and decreased felt closeness and desire for closeness when forming friendships (Ketay et al., 2019), the decision to initiate interaction with others is understudied. Social interaction involves an abundance of social stimuli that each party must then interpret (Wolf et al., 2018). Information processing and interpretations of this information involves a complexity that leads to different social decisions and behaviors, some of which are unconscious (Ziv & Hadad, 2021). In addition to social anxiety, an understudied cognitive trait that may be related to social interaction is the Need for Cognitive Closure (NFCC), which is the need to find a firm answer instead of allowing ambiguity or uncertainty to remain (Kruglanski et al., 2010). Within the current study, we aimed to explore how NFCC, social anxiety, Intolerance for Uncertainty (IU), and the Big Five personality traits were related to one another, and how they predicted social interaction in a structured lab setting.

Personality Traits and Social Interaction

The Big Five domains consist of five broad personality categories: extraversion, agreeableness, conscientiousness, neuroticism, and openness. According to John and colleagues (2008), research on personality traits was developed over several decades, starting from numerous lexical categories that described various aspects of personality. Through extensive research and validation, these categories were distilled into the five core traits we recognize today as a comprehensive summary of personality characteristics. Extraversion is often the personality trait most associated with social interaction. In a review of the literature, Harris and Vazire (2016) suggested that overall, people who are more extraverted experience social interaction more positively, increasing the likelihood of engaging with strangers and approaching multiple others. A laboratory observation demonstrated that both extraversion and agreeableness were strongly related to how dyads of strangers meeting for the first time interacted (Cuperman & Ickes, 2009). More extraverted participants felt more comfortable in the interaction. More agreeable participants generally found their interaction more enjoyable, and people more open to new experiences were more likely to initiate conversation. In addition Hebel and Rentzsch (2022) demonstrated that extraversion, agreeableness, and openness were also related to the desired physical distance from a stranger on a couch, suggesting that multiple Big Five traits impact social interaction.

Social Anxiety and Social Interaction

Social anxiety is another trait that influences social interactions that can range from minor discomfort in social situations to a diagnosable disorder involving anxiety or fear of social situations, negative evaluations, and avoidance of social interactions (American Psychiatric Association, 2022). In 2001-2002, 7.1% of adults in the United States were diagnosed with SAD,

and 12.1% were estimated to experience it in their lifetime (National Institute of Mental Health, 2018). However, a more recent study of young adults across seven countries reported 36% of participants met the criteria for SAD, even though 18% of those participants perceived themselves as not having social anxiety (Jefferies & Ungar, 2020). It appears that the prevalence of social anxiety is increasing, and individuals may not be aware of its effects on their mental and physical health.

Need for Cognitive Closure (NFCC)

NFCC theory was pioneered by Kruglanski (1990). NFCC includes five sub-factors, including Need for Order, Need for Predictability, Decisiveness, Avoidance of Ambiguity, and Closed-mindedness (Webster & Kruglanski, 1994). NFCC influences how and why people acquire and use information to make social judgments or decisions. NFCC is seen as a trait characteristic of individuals but can also be induced by, for example, time pressure (Choi et al., 2008), feelings of insignificance (Webber et al., 2018), and motivation for goals related to the defense of the ego, self-improvement, or impression management (Chaiken et al., 1989). In previous studies, higher NFCC scores were linked to a lack of trust in unknown individuals (Acar-Burkay et al., 2014), greater use of stereotypes in interactions (Dreu et al., 1999), less accurate assumptions about romantic relationships and less reliance on a partner's opinion (Therodorou & Livi, 2021), quicker decision making (Bouckenooghe et al., 2007), and heavier use of known mental models of group social relations that have been generated prior to the interaction (Bukowski et al., 2012). In addition, White (2022) found that NFCC positively correlated with stress and anxiety. People high in NFCC showed increased negative arousal in response to anxiety and stress and were more sensitive to negatively rather than positively emoted facial features (Wei et al., 2015). High NFCC individuals may also perceive more

negativity from the same facial expressions than those lower in NFCC, and thus may be more likely to interpret a social situation negatively, increasing stress and anxiety. Overall, NFCC appears to decrease the amount of new, information used in social decision-making in comparison to information from previous experiences, increases reliance on quick cognitive shortcuts, and may lead to more negative interpretations of social interactions. Those higher in NFCC may thus be less open to interacting with others.

NFCC and IUS

The concept of intolerance for uncertainty appears to overlap with NFCC and is defined as "the tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events" (Dugas et al., 2004, p. 143). The Intolerance for Uncertainty Scale (IUS) measures feelings about ambiguous situations, general uncertainty, and future circumstances (Freeston et al., 1994). The original IUS included four factors, including desire for predictability, tendency to become paralyzed by uncertainty, tendency to respond to uncertainty with distress, and inflexible uncertainty beliefs (Berenbaum et al., 2008). There is some overlap between the IUS and NFCC scales – the Ambiguity and Predictability subscales of the NFCC are moderately and positively correlated with all four subscales of the IUS (Berenbaum et al., 2008).
During information processing, Dugas and others (2005) found that those high in IU tended to interpret ambiguous information as threatening. In addition, IU was found to be related to social anxiety (Boelen & Reijntjes, 2009). More specifically, two subfactors of the abbreviated IUS (IUS-12 – Carleton et al., 2007) positively predict both social interaction anxiety and performance anxiety (e.g., anxiety while public speaking, taking examinations, and eating in public) beyond other measures commonly correlated with anxiety (Whiting et al., 2014). As previously stated, those higher in NFCC have also been shown to have higher levels of both

stress and anxiety (White, 2022). Overall, the literature indicates that individuals high in either IU or NFCC could be less likely to interact with strangers, similarly to those with social anxiety.

Social Anxiety, IU, and NFCC

Little research has been conducted on social anxiety and NFCC together. One study found that the Need for Structure subscale of NFCC was positively correlated with social anxiety and neuroticism, and negatively correlated with extraversion and openness (Stadler, 2007). As with NFCC, individuals higher in social anxiety are more sensitive to negative characteristics of those they are interacting with (Lee, 2021). This may explain why individuals higher in social anxiety were less cooperative and experienced more stress and anger in a competitive game study (Tone et al., 2019). The findings that increased individualism and lack of trust exhibited by those high in social anxiety in the competitive game study by Tone and colleagues (2019) were similar to a study by Acar-Burkay and others (2014). Social anxiety and NFCC are both positively correlated with neuroticism and negatively correlated with extraversion (Kaplan et al., 2015). In addition, NFCC and interaction anxiety (as opposed to performance anxiety) have both been found to have a significant relationship with IU (Berenbaum et al., 2008; Whiting et al., 2014, respectively). Individuals high in NFCC have issues with trust in strangers (Acar-Burkay et al., 2014) as do those high in social anxiety (Kaplan et al., 2015). This may explain why people with higher levels of social anxiety prefer to keep greater physical distance between themselves and a stranger (Givon-Benjio et al., 2020; Perry et al., 2013). Moreover, we could not find research on how NFCC and IU might impact distance preferences, but it is likely that people higher in these traits would also prefer to keep greater distance between themselves and strangers, similarly to those higher in social anxiety.

The Current Study

In the current study, we studied how different traits predicted the decision to interact with a stranger, with a particular focus on NFCC, IU, and social anxiety. Most of the research on social interaction focuses on either forced interactions in lab environments or on relationships with familiar others (Sandstrom & Boothby, 2021). In the current study we examined people's unforced decisions to interact, and how much space they preferred between themselves and a stranger. In addition, little research has been conducted on the link between NFCC and social anxiety. A secondary purpose of this study was to explore how NFCC, social anxiety, IUS, and the Big Five personality traits correlated with each other.

Hypotheses

H1a: People higher in extraversion, agreeableness, and openness would be more likely to interact with a stranger.

H1b: People higher in extraversion, agreeableness, and openness would put less physical distance between themselves and a stranger.

H2a: People higher in NFCC, IU, and social anxiety would be less likely to interact with a stranger.

H2b: People higher in social anxiety would put more physical distance between themselves and a stranger.

RQ: How will NFCC and IU be related to the amount of physical distance put between participants and a stranger?

H3: NFCC, social anxiety and IUS would positively correlate with one another.

H4: Social anxiety, IUS and NFCC would negatively correlate with extraversion and positively correlate with neuroticism.

H5: People higher in social anxiety would have higher latency until interaction, that is if they interact at all.

RQ2: How do the subscales of the NFCC scale and social anxiety correlate?

Method

Participants

The current study consisted of 30 participants who consisted of 20 women (66.7%) and 10 men (33.3%) aged 18 to 67 (M = 30.07, SD = 13.38). Upon Institutional Review Board (IRB) approval, participants were recruited by in-person recruiting in classes, online class announcements from faculty members, and physical fliers posted on the campus of a small midwestern university. The majority of participants came from within the psychology department. Potential participants were informed that this was a study on personality and preference in chocolate choices and were told they would be given a chocolate bar of their choice as an incentive for participation. Participants were excluded from participating if they were younger than 18 years old.

Materials and Measures

The current study was a structured lab observation. The quasi-independent variables were measured via an online survey, and included NFCC, IU, social anxiety and the Big Five personality factors. The dependent variables in this study included whether the participant socially interacted with a confederate or not, physical distance from the stranger, and social interaction latency. A paid confederate was recruited from the Theatre department. Social interaction was defined as the participant initiating conversation with the confederate upon the researcher leaving the room in which the study took place. Physical distance from the confederate was measured as the physical distance between a chair chosen by the participant in

relation to where the confederate was seated. Social interaction latency was measured from the moment the researcher left the room to the moment in which the participant socially interacted with the confederate. Participants were given a maximum of 3 minutes to interact. Time was measured by the stopwatch app on both the researcher's and confederate's respective smartphones.

Need for Cognitive Closure

NFCC was measured using the full Need for Cognitive Closure Scale (NFCS) (Webster & Kruglanski, 1994), which is a 41-item questionnaire consisting of five subscales including Need for Order, Need for Predictability, Decisiveness, Avoidance of Ambiguity, and Closed-Mindedness. The scale includes statements that participants rated on a 6-point Likert scale from 1 (*strongly disagree*) to 6 (*strongly agree*). The scores for the subscales were summed after indicated items were reverse-coded. In addition, total NFCC was also calculated by summing all subscale scores.

Social Anxiety

Social anxiety was measured using the Liebowitz Social Anxiety Scale Self-Report version (LSAS-SR) as used in Baker et al. (2002). The LSAS-SR is a 24-item scale that assesses social interaction anxiety (11 items) and performance anxiety (13 items). The scale includes social situations which participants rate in terms of both fear and avoidance on a 4-point Likert scale. The fear subscale items were rated from 0 (*none*) to 3 (*severe*). The avoidance subscale items were rated from 0 (*never*) to 3 (*usually*). A few adjustments to dated language were made in this study. "Trying to pick someone up" was changed to "Asking a stranger on a date," "Telephoning in public" was changed to "Talking on the phone in public," and "Returning goods to a store" was changed to "Returning items to a store." We summed responses from each

subscale of fear and avoidance for both interaction and performance anxiety. In addition, a total anxiety score was also calculated by summing responses across subscales.

Intolerance for Uncertainty

Intolerance for uncertainty was measured using the Intolerance for Uncertainty Scale (IUS; Buhr & Dugas, 2002). The IUS is a 27-item scale that measures worry associated with uncertainty or ambiguity, and includes statements involving uncertain situations which the participant rates on a 5-point Likert scale from 1 (*Not at all characteristic of me*) to 5 (*Entirely characteristic of me*). The scores are the summed values of responses from each subscale, as identified by Berenbaum et al. (2008), who found that not all the original factors identified by Buhr and Dugas were replicated. These subscales included Desire for Predictability, Uncertainty Paralysis, Uncertainty Distress, and Inflexible Uncertainty Beliefs.

Big Five Factors of Personality

The Big Five personality traits were measured using the Mini-International Personality Item Pool (Mini-IPIP; Donnellan et al., 2006), a 20-item version of the original 50-item measure. This Mini-IPIP measures the personality factors of intellect/imagination (openness), conscientiousness, extraversion, agreeableness, and neuroticism with four questions measuring each trait. Each item was rated on a 5-point Likert scale from 1 (*Very Inaccurate*) to 5 (*Very Accurate*). After reverse scoring indicated items, values for the relevant items were averaged for each of the five traits.

Procedure

We modified Sandstrom and Boothby's (2021) lab-intervention study discussed in their 2021 mini meta-analysis. The lab was arranged to include a computer at the front of the room, where participants answered the survey questions presented via Qualtrics, and five chairs were

placed in a row, 15 centimeters apart from one another. The confederate was seated at a desk next to the entrance to the room with a laptop in front of them and remained in the lab the entire time. The confederate was a White woman with short hair, androgynous features, and glasses. The participants were taken into the lab and a script was orated by the researcher, who was always the first author. After participants signed a consent form, they were asked to place their phone in a basket until the end of the study to avoid distraction. The participant was then directed to the computer to take the assessment. The assessment was the same for all participants. It began with demographic information of age, gender, and ethnicity, and then the questionnaires for NFCC, LSAS-SR, IUS, and Mini-IPIP, in that order. The researcher was a bald, White male with red facial hair and visible tattoos on his arms. Neutral clothing was consistently worn by both the confederate and researcher.

After the online assessment was complete, the researcher announced that they needed to get the chocolates in order for the participant to make their choice. The participant was instructed to take a seat in one of the available chairs and told that the researcher would be back in a few minutes. Once the researcher left the room, the stopwatches were started, and the researcher waited outside the lab. The confederate was instructed not to initiate a conversation, but they stopped paying attention to the laptop in front of them and made themselves open to the participant by looking in their direction. After three minutes, the researcher came back into the room and the participant was debriefed. The participant then answered questions regarding their familiarity with the confederate and if they knew what the true purpose of the study was. They then were given their choice of chocolate bars for their participation. The participant was given a debrief form and a copy of their consent form, they were thanked for their time and participation, and asked not to mention the true nature of the study until data collection was completed. The

chair number chosen when the researcher left the room (1, 2, 3, 4, 5) was noted and used to determine distance. The first chair was placed 135cm in front of the confederate's desk and each chair was 15cm from the previous chair.

Results

We found that there was very limited social interaction. Among the 30 participants, six (20%) interacted with the confederate. If there was interaction, it occurred immediately, as the researcher left the room, thus latency was not actually a variable and was dropped from consideration.

To test hypothesis 1a, multiple independent samples t- tests were conducted between those who did and did not interact for the five personality traits. Only differences in openness to new experiences were significant, and in the predicted direction (see Table 1). Interestingly, conscientiousness also approached significance, with a medium effect size

To test hypothesis 1b, multiple ANOVAs were conducted, with chair selection as the factor, and the five personality traits as the DVs. There was no significant relationship between chair selection and the five personality traits (see Table 2). However, effect sizes for agreeableness and openness were large – and mean agreeableness scores increased the closer the participant sat to the confederate (M = 3.92, M = 4.00, M = 4.37, M = 4.38, respectively).

To test hypothesis 2a, independent samples t- tests were conducted between those who had and had not interacted with the confederate for all three variables. As predicted, those who did not interact had significantly higher IU scores than those who did, $t(28) = -1.92$, $p = .032$, $d = -.84$ but although the means for NFCC and social anxiety were also in the predicted direction, differences between the two groups for these variables were not significant (see Table 3).

To test hypothesis 2b and to see if NFCC and IU would be related to the amount of physical distance, multiple ANOVAs were conducted, with chair selection as the factor, and social anxiety, NFCC, and IU as the DVs. Chair selection was not related to any of these variables (see Table 4).

To test hypothesis 3, we ran correlation analyses between social anxiety, IU, and NFCC. Participants' IU scores were significantly and positively correlated with the NFCS, $r(28) = .75$, $p < .001$, and with social anxiety, $r(28) = .48$, $p = .004$ (see Table 5). In addition, there was a significant positive correlation between NFCC and social anxiety, $r(28) = .40$, $p = .027$.

To test hypotheses 4, we ran correlation analyses between social anxiety, IU, NFCC, extraversion, and neuroticism No significant correlations were found between social anxiety or NFCC scores and extraversion, although all correlations were negative (see Table 5). However, neuroticism was approaching a significant moderate positive correlation with social anxiety scores, $r(28) = .29$, $p = .06$, and had a significant positive correlation with the NFCS $r(28) = .47$, $p = .01$.

Hypothesis 5 could not be tested as time until interaction was immediate, or no interaction occurred.

To test whether the subscales of NFCC and LSAS correlated, we ran two-tailed correlations between the five subscales of the NFCS and the four subscales of the LSAS. The NFCS subscale Need for Predictability was positively correlated with three of the four social anxiety subscales (see Table 6). In addition, Closed-Mindedness was significantly and positively correlated with both Fear of Social Interaction and Fear of Performance. Finally, avoidance of ambiguity was also positively correlated with fear of performance.

Discussion

The current study aimed to uncover predictors of initiating social interaction between strangers. We found that very few people (20%) were willing to interact with strangers, but those higher in openness and lower in IU were more likely to do so. No one sat close to the confederate (only chairs 2 through 5), but there was no significant relation between any of our variables and physical distance chosen.

The first hypothesis was that people higher in extraversion, agreeableness, and openness would be more likely to interact with a stranger. Hypothesis 1 was partially supported. Only differences in openness to new experiences were significant, although it is worth noting that the means for agreeableness were in the predicted direction, and a small effect size. We also thought that those higher in extraversion, agreeableness, and openness would put less physical distance between themselves and a stranger. This hypothesis was not supported, but because effect sizes for agreeableness and openness were large, it is possible that with additional participants we might see that people higher in agreeableness and openness would be significantly more likely to sit closer to a stranger.

We also examined the role of NFCC, IU, and social anxiety in social interaction for our second hypotheses and predicted that people higher in these traits would be less likely to interact with a stranger and put more distance between themself and a stranger. As predicted, those who did not interact had significantly higher IU scores than those who did. However, the means for NFCC and social anxiety, though in the predicted direction, were not significantly different between those who did and did not interact. The significant results for IU suggest that those who avoid ambiguity tend to be less likely to interact with others because they do not know the various outcomes of an interaction or if they are supposed to interact with anyone. The

personality trait of openness also being significant supports this argument. Being more open to new experiences, regardless of the level of control of a situation would increase the probability of social interaction. Surprisingly, IU, NFCC, and social anxiety were not related to distance selected from the confederate.

We also predicted that NFCC, social anxiety, and IU would all be positively correlated, which was supported, successfully replicating previous research (Berenbaum et al., 2008; Whiting et al., 2014). However, the hypothesis that social anxiety, IU and NFCC would negatively correlate with extraversion was not supported by our results but is in line with some past research (Stadler, 2007). In addition, we predicted that social anxiety, IU, and NFCC would positively correlate with neuroticism. Neuroticism was moderately to strongly correlated with NFCC, but was not significantly correlated with social anxiety, supporting research by Kaplan and colleagues (2015), and moderately to strongly correlated with NFCC. More neurotic people tend to also have more social anxiety and are higher in need for cognitive closure.

Finally, we examined how subscales of the NFCS and LSAS correlated. NFCC and social anxiety were positively correlated overall, contradicting previous findings by Stadler (2007). More specifically, the Need for Predictability subscale of NFCC was positively correlated with Fear of Interaction and Performance, and Avoidance of Performance (but not Avoidance of Interaction). The Closed-Mindedness subscale of NFCC positively correlated with Fear of Interaction and Fear of Performance, but not Avoidance of Performance. Considering the relationship found between these NFCC subscales, social anxiety, and IU, the need to have predictable situations likely underlies lack of social interaction. Lack of trust, exhibited by those high in social anxiety (Kaplan et al., 2015), may be an outward expression of needing predictability, and trust in individuals increases perceived predictability. The correlation between

Closed-Mindedness and both Fear of Interaction and Fear of Performance may indicate that individuals who are more closed-minded focus more on heuristics, including a negativity bias in interactions as found in previous research (Wei et al., 2015). Regarding Closed-Mindedness, those high in social anxiety may be unwilling to risk new situations that they cannot predict (Whiting et al., 2014), expect unknown social interactions to go poorly (Teachman & Allen, 2007), and prefer more predictable situations or may avoid them entirely (Tre & Alden, 2012). The correlation of Need for Predictability to the Fear and Avoidance subscales and Closed-Mindedness to the Fear subscales of the LSAS, but not the Avoidance subscales, may indicate that individuals experience both social performance and interaction negatively, the inability to predict a social interaction increases avoidance. While these findings are not novel, they provide more evidence of the cognitive motivations of those high in social anxiety.

Limitations and Future Directions

The hypotheses regarding direct social interaction were undermined by the infrequent interaction with the confederate. This problem was also found by Sandstrom and Boothby (2021) who had to tell participants they were there for social interaction to increase social interaction. Sandstrom and Boothby (2021) also had a 20% interaction rate before changing their procedure. The authors mentioned that participants didn't know they were allowed to talk, and some participants made similar statements in our study. So, although a lab setting helps to control extraneous variables, it may have increased rather than decreased the ambiguity of a situation, discouraging social interaction. In addition, the confederate may have been seen as an authority figure, which may have decreased interaction likelihood. We also thought that it was possible individuals were fatigued after taking the 10-minute assessment, and after the first 20 participants, we changed the protocol to observe the social interaction opportunity before

participants took the survey. This did not increase the interaction rate. Future studies could strive to remove ambiguity from the environment, and ask participants their impressions of the confederate, to ensure that they are seen as approachable. It is difficult to encourage social interaction without forcing it to occur and skewing the results. Perhaps such limited interactions with strangers are normal. Sandstrom and Boothby (2021) prepared individuals for interaction, but measured interaction with a confederate unknown to the participant. Regardless, future studies should expect social interaction to be low and plan to recruit larger sample sizes.

Chair placement may have limited distance as a variable. In the current study, the chairs were in the middle of the room, giving participants five choices. However, allowing participants to place a chair anywhere in the room would have provided more variability in distance. In addition, having an odd number of chairs may have been problematic, as there was a middle-chair bias. Future studies may benefit from forcing a choice if providing chair choices. Additionally, our Big Five traits did not yield the expected results, particularly extraversion. In the interest of brevity, we used a shortened scale. Although the mini-IPIP is a reliable measure, it is possible that using a longer version would have yielded a better replication of past findings. On the other hand, a particular type of person may have volunteered for this study, limiting variability of some personality traits.

Conclusion

To conclude, although we did not find that NFCC or social anxiety predicted interactions with strangers, openness and Intolerance of Uncertainty did. It appears that the willingness to be open to new experiences and having a high tolerance for uncertainty are the best predictors for initiating social interactions. It is unclear why NFCC and social anxiety both correlate with IU but do not predict social interactions as well. It is possible that intolerance of uncertainty is an

underlying factor for NFCC and social anxiety, but not vice versa. The Avoidance of Ambiguity subscale of NFCC approached significance (p = .053) for predicting interaction. It seems that for individuals to interact, they need to become more comfortable with the unknown, or have more of an idea of how an interaction will proceed. Gaining familiarity with the behaviors of the people around them should increase interaction, as can be observed in interactions between coworkers or others in which consistent interaction opportunities exist, generally increasing with time.

As previously discussed, people with SAD may be particularly prone to avoiding social interactions, and thus may be more likely to be negatively affected by lack of social interaction. If cognitive social interaction predictors are identified, options to remedy social anxiety and improve the well-being of individuals will increase. Knowing that intolerance for uncertainty may be an underlying factor in lack of social interaction may help in discovering links between behaviors and cognitive motivation. Based on the current study, cognitive behavioral therapy that focuses on recognizing and reducing discomfort with ambiguous situations may increase mental and physical health for those experiencing social anxiety.

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Table 1

Differences in Mean Big Five Personality Scores for those who did and did not Interact

	Interacted	**Did not Interact**			
	Mean (*SD*)	Mean (*SD*)	*t* value	*p*	*d*
Extraversion	2.21 (.66)	2.20 (.67)	.03	.49	.02
Agreeableness	4.33 (.38)	4.23 (.47)	.51	.31	.23
Openness	4.50 (.50)	4.06 (.57)	1.72*	.05	.79
Conscientiousness	4.00 (.50)	3.64 (.59)	1.39	.09	.63
Neuroticism	3.33 (.83)	3.29 (.56)	.147	.44	.07

Note. *Significance is at the 0.05 level (one-tailed).

Table 2

ANOVAs Showing the Relationship between Chair Choice and Big Five Personality Scores

	F	***p***	**Eta-squared**
Extraversion	.119	.948	.014
Agreeableness	1.65	.202	.166
Openness	.81	.499	.114
Conscientiousness	1.74	.184	.089
Neuroticism	1.07	.379	.173

Note. *Significance is at the 0.05 level (one-tailed).

Table 3

Differences in NFCC, IU, and social anxiety Scores for those who did and did not Interact

	Interacted	**Did not Interact**			
	Mean (*SD*)	Mean (*SD*)	*t* value	*p*	*d*
NFCC	151.17 (23.00)	157.29 (25.49)	-.54	.30	-.24
Social Anxiety	39.50 (18.98)	51.75 (27.43)	-1.03	.16	-.47
IU	53.00 (13.42)	68.92 (19.01)	-1.92*	.03	-.84

Note. *Significance is at the 0.05 level (one-tailed).

Table 4

ANOVAs Showing the Relationship between Chair Choice and SA, NFCC, and IU

	F	***p***	**Eta-squared**
NFCC	.147	.931	.017
Social Anxiety	.309	.818	.036
IU	.618	.610	.069

Note. *Significance is at the 0.05 level (one-tailed).

Table 5

Correlations between NFCC, Social anxiety*, IUS, Extraversion and Neuroticism*

	NFCC	**SA**	**IU**	**Extraversion**	**Neuroticism**
NFCC	1				
SA	.40*	1			
IUS	.75**	.48**	1		
Extraversion	-.12	-.25	-.25	1	
Neuroticism	.48**	.16	.51**	-.11	1

Note. *Correlation is significant at the 0.05 level (one-tailed). **Correlation is significant at the 0.01 level (one-tailed).

Table 6

Correlations between the Subscales of the LSAS and the NFCS

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1 - Avoidance Social (SA)	1								
2 - Fear Social (SA)	.69**	1							
3 – Avoidance Performance (SA)	.74**	.74**	1						
4 – Fear Performance (SA)	.56**	.90**	.83**	1					
5 - Need for Order (NFCS)	.08	.24	.15	.29	1				
6 – Need for Predictability (NFCS)	.17	.47*	.46*	.54**	.58**	1			
7 – Decisiveness (NFCS)	-.01	.08	.06	.07	.47**	.50**	1		
8 – Avoidance of Ambiguity (NFCS)	-.01	.30	.31	.40*	.55**	.60**	.73**	1	
9 – Closed-Mindedness (NFCS)	.22	.45*	.35	.48**	.27	.27	-.03	.30	1

Note. *Correlation is significant at the 0.05 level (two-tailed). **Correlation is significant at the 0.01 level (two-tailed).