

**Surfing Safely: An Examination of Online Dating Skills in
Young Adults with Autism Spectrum Disorder**

by

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A dissertation submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

Auburn, Alabama
August 1st, 2015

Keywords: Adults with Autism Spectrum Disorders; online dating; sexuality; victimization

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Abstract

Adults with Autism Spectrum Disorder (ASD) have difficulty forming romantic relationships, despite having motivation to establish them. The lack of success through traditional, face-to-face dating may lead adults with ASD to pursue relationships through other modalities, such as online dating. There are a number of advantages offered by online dating for adults with ASD; however, there are also a number of disadvantages to online dating for the population. To date there has not been an empirical examination of online safety skills or online dating skills in adults with ASD, which was the aim of the current study. Participants included 30 adults with ASD and 57 typically developing adults, whom were compared on a number of variables. The results revealed that adults with ASD had fewer previous relationships, sources to learn about relationships, and behavioral skills in online dating. Conversely, the ASD group had more online dating experience, previous online victimization, and inappropriate methods of courting. The two groups had equal knowledge of online dating and motivation to remain safe. Additionally, the social communication deficits of ASD were found significant predictors of previous online victimization and inappropriate courting.

Acknowledgements

I am indebted to Jennifer Gillis for her guidance over the past five years. I am extremely grateful for her support and dedication to my graduate training and am fortunate that she took a chance on me as her graduate student five years ago. I am also thankful for the support and feedback provided by Elizabeth Brestan-Knight, Barry Burkhart, Aimee Callender, and Allison Plumb in their role as committee members. Furthermore, I am appreciative of the assistance from Ray Romanczyk in securing the laboratory space and technology needed for this study. This work would not be possible without the gracious efforts of the participants who provided their time and efforts to contribute to the research literature in the field. I am also thankful for the continuing love and support from my parents and sister, which without, I would not be not the person I am today. Finally, I am forever grateful for the unconditional love and support from my wife, Stacey, and the sacrifices she made in order for me to pursue my ambitions. With her, I share this accomplishment.

Table of Contents

Abstract	ii
Acknowledgements	iii
Introduction	1
Autism Spectrum Disorder	1
Social functioning	1
Romantic relationships	2
Victimization	4
Online Dating	6
Online dating and autism spectrum disorder	8
Creating a profile	9
Reading a profile	10
Deception	11
Initial contact	12
Boundaries	13
Information-Motivation-Behavioral Skills (IMB) Model	16
Summary and Current Study	17
Objective one	19
Objective two	20
Method	21
Participants	21
Measures	25
Procedures	30
Results	32
Diagnostics	32
Internal Consistency	32
Dating Functioning and Dating History	33
Sources of Information	34

Online Victimization.....	34
Courting Behaviors.....	35
IMB Variables.....	36
Predictors of Online Victimization.....	38
Predictors of Inappropriate Courting Behavior.....	39
Discussion.....	41
Objective One.....	41
Dating functioning and dating history.....	41
Sources of information.....	42
Online victimization.....	43
Inappropriate courtship behaviors.....	44
Online dating knowledge.....	45
Motivation.....	46
Behavioral skills.....	46
Objective Two.....	49
ASD severity and online victimization.....	49
ASD severity and inappropriate courting behaviors.....	51
Internal Consistency.....	52
Limitations.....	53
Strengths.....	55
Future Directions.....	56
Conclusion.....	59
References.....	60
Appendices.....	73
Appendix A.....	74
Appendix B.....	78
Appendix C.....	80
Appendix D.....	86

List of Tables

1. Quantitative Demographic Information.....	87
2. Qualitative Demographic Information.....	88
3. Chi-Square Analysis for Categorical Data.....	90
4. Cronbach's Alpha Calculations for the IMB Scales.....	91
5. Sources of Social And Romantic Knowledge.....	92
6. Summary of Backward Multiple Regression Analysis for SRS-2 Scales.....	93
7. Summary of Multiple Regression Analysis for CBS-2 Scales.....	94

List of Figures

1. Assignment to Groups.....	95
2. Average Scale Scores on the Staude-Müller Scale.....	96
3. Average Endorsement on the CBS Pursuing Scale.....	97
4. Targets of Courting Behavior on the CBS Pursuing Scale.....	98
5. Percentage Correct on ROST Items.....	99

Introduction

Autism Spectrum Disorder

Presently, the *Diagnostic and Statistical Manual, fifth edition* (DSM-5), defines the main diagnostic features of Autism Spectrum Disorder (ASD) as impairment in social communication and interaction and the presence of restricted, repetitive, patterns of behavior, interests, or activities (RRBs; APA, 2013). Together, the social communication deficits and RRBs are commonly referred to as the *core deficits*. In the following sections, an examination of the relevant literature will explore how the core deficits of ASD impact romantic functioning, particularly in the area of online dating, a potentially advantageous modality for adults with ASD to find romantic partners. Although there has not been a comprehensive empirical evaluation of online dating and ASD, it will be demonstrated, using literature from the ASD and typically developing fields, that there are numerous problematic aspects of online dating for the ASD population, particularly with victimization, which require empirical attention.

Social functioning. Individuals with ASD experience impairments in the core deficits across the lifespan, which often leads to low quality of life in adolescence and adulthood (Jennes-Coussens Magill-Evans, & Koning, 2006). For instance, examinations of social relationships have revealed that establishing and maintaining social relationships are problematic for adults with ASD (Jennes-Coussens et al., 2006). Studies that have examined friendships in adults with ASD have found few social acquaintances (ranging from 15% to 20% having a social acquaintance) and “close” friendships (ranging from 8% to 26%; Howlin, Goode, Hutton, & Rutter, 2004; Orsmond, Krauss, & Seltzer, 2004). A lack of social relationships has been correlated with symptoms of psychological distress for the population. Recently, Mazurek (2014) found that number of friendships were predictive of feelings of loneliness, which was found to be

associated with increased depression and anxiety, and decreased life satisfaction and self-esteem in adults with ASD. Taken together, social isolation, along with other associated problems for this population, including difficulty in independent living and employment, puts adults with ASD at high risk for comorbid psychopathology (Baghdadli et al., 2012; Billstedt, Gillberg, & Gillberg, 2003; Howlin, 2004).

Romantic relationships. Adults with ASD also have difficulty with sexual functioning and romantic relationships. Studies have demonstrated that adolescents and adults with ASD have less sexuality related knowledge (about sexual behaviors, romantic relationships, biological aspects of sexuality, and sexually transmitted diseases) than their typically developing peers (Brown-Lavoie, Vecili, & Weiss, 2014) as well as their same-aged peers with intellectual disability (Ousely & Mesibov, 1991). However, studies without a comparison group have yielded better results in regard to knowledge (Byers, Nichols, Voyer, & Reilly, 2013; Hénault & Attwood, 2002), which may be a result of the higher-functioning portion of the ASD population that have completed these studies. Furthermore, individuals with ASD have been found to rely on fewer social sources of information (i.e., peers) to learn about sexuality and may rely more on media sources (i.e., the Internet, pornography; Brown-Lavoie et al., 2014; Stokes, Kaur, & Netwon, 2007). Taken together, these results suggest that deficits in sexuality-related knowledge may be attributed to having fewer sources to learn about sexuality, likely due to the social deficits of the disorder.

In regards to interest in dating and relationships, research has shown that there is an interest in dating, long term relationships, and sexual relationships that is comparable to the general population (Gilmour, Schalomon, & Smith, 2012; Hellemans, Colson, Verbraeken, Vermeiren & Deboutte, 2007; Hénault & Attwood, 2002; Lunskey & Konstantareas, 1998).

Unfortunately, despite their interest, adolescents and adults with ASD are typically unsuccessful in their attempts to establish romantic relationships (Byers, Nichols, & Voyer, 2013; Hellemans et al., 2007; Howlin et al., 2004; Jennes-Coussens et al., 2006). Interestingly, Byers and colleagues (2013a) noted that in their sample, older adults with ASD had more success in relationships, suggesting that younger adults with ASD may be more delayed in their social development, but may experience more success in dating later, potentially due to an increase in social skills with age.

Given the low rates of dating and romantic relationships in the population, it would be expected that sexual relationships would also be low, however, data have been mixed thus far. For instance, fewer sexual experiences have been found for young adults with ASD when compared to a typically developing control group (Mehzabin & Stokes, 2011), though Gilmour and colleagues (2012) found that a group of adults with ASD did not significantly differ from a typically developing control group in previous sexual experiences. However, the ASD group ($M_{\text{age}} = 28.9$ years) was noted to be significantly older than the typically developing control group ($M_{\text{age}} = 23.2$ years), which may account for the difference in experience. Furthermore, “sexual experience” in this study was operationalized as a single score on a measure inquiring about behavior ranging from deep kissing to intercourse, and the distribution of sexual experiences was not reported (i.e., the ASD sample may have had mostly had “deep kissing” experience). Nonetheless, though adults with ASD have been found to date and engage in sexual behavior, most studies have reported lower rates than the typically developing population.

Recently, researchers have begun to examine sexual well-being and satisfaction in adults with ASD. These early studies have found moderate sexual satisfaction for adults who had been in a previous relationship and high sexual anxiety for adults who had not been in a previous

relationship (Byers et al., 2013a; Byers et al., 2013b). Interestingly, less ASD symptomology was associated with greater sexual satisfaction, suggesting the importance of intervening on the core symptoms (Byers et al., 2013b). Given that interest in romantic and sexual relationships, coupled with difficulty establishing such relationships, can lead to feelings of loneliness, frustration, anxiety, and depression (Hellemens et al., 2007), it is important to provide the population with an opportunity to maximize their potential for success in this area.

Victimization. It is believed that the core deficits of ASD also put adults at-risk for victimization from others (e.g., dating violence and sexual abuse; Sevelever, Roth, & Gillis, 2013). Although other clinical populations are also characterized by social skills deficits (e.g., Attention-Deficit/Hyperactivity Disorder), the specific social skills deficits of ASD are thought to lead to *greater* impairment in keeping oneself safe. Particularly, it is thought that verbal (e.g., pragmatic language problems) and nonverbal (e.g., picking up on and comprehending social cues) social communication deficits lead to difficulty interpreting social cues, and as a result, difficulty discriminating between those who are safe versus unsafe (i.e., those who are using deception). Additionally, other risk factors, such as a reliance on others, social isolation, unquestioning compliance, and a lack of sexual information may contribute to an increased risk of victimization (Eldeson, 2010; Sevelever et al., 2013). To date, there has been one examination of victimization in a sample of adults with ASD, which found that adults with ASD were three times more likely to experience unwanted sexual contact, 2.7 times more likely to experience sexual coercion, and 2.4 more likely to experience rape, compared to a typically developing control. Overall, 78% of the sample reported at least one instance of victimization (Brown-Lavoie et al., 2014). No differences in victimization were found between males and females with

ASD. Though replication is needed, preliminary data suggest troubling rates of victimization in the ASD population, which warrants immediate attention.

Conversely, adults with ASD are also thought to be at-risk for victimizing others. Although there is some data suggesting that there is higher prevalence of ASD in the criminal justice system for some crimes (e.g., assault during an altercation), these studies have varied widely in their methodology and there has not been enough replication to conclude the population is at a higher risk (Cheely et al., 2012; King & Murphy, 2014; Sevlever et al., 2013). One type of victimizing behavior that has received attention for the ASD population is inappropriate courting (pursuing someone for an unacceptable period of time or not accepting “no”), known colloquially as “stalking” (Post, Haymes, Storey, Loughrey, & Campbell, 2014). To date, there has been one study on stalking behavior in individuals with ASD (Stokes et al., 2007). Parents of a group of adolescents and adults with ASD ($n=25$, $M_{age}=22.21$,) and typically developing peers ($n=38$, $M_{age}=20.83$) completed a researcher-developed instrument, the *Courting Behavior Scale* (CBS). Results indicated that though the ASD group initiated less romantic contact than the typically developing group, individuals with ASD attempted more inappropriate courtship behaviors: touching someone inappropriately, making inappropriate comments, monitoring one’s activity, following others, pursuing them in a threatening manner, and making threats against others and themselves. Additionally, individuals with ASD persisted in pursuing a potential partner longer even when there was no response or negative response from the person. The authors speculated that a lack of empathy and awareness of social norms led to difficulties understanding appropriate versus inappropriate courtship behaviors. Unfortunately, individuals with ASD may not be aware that their behavior could be perceived as stalking and it may lead to contact with the justice system.

The limited research in the area of victimization and ASD has led to wide speculation about the potential variables that may contribute to adults with ASD victimizing others. For instance, some have suggested that sexual frustration, difficulty judging social situations and intentions of others, deficits in perspective taking, intense interests in other individuals and sexual preoccupations (RRBs), poor emotional regulation, and high rates of psychopathology could all potentially be contributing factors to victimizing behavior (Kalyva, 2010; King & Murphy, 2014; Murrie, Warren, Kistiansson & Dietz, 2002; Ruble & Dalrymple, 1993; Sevlever et al., 2013; Van Bourgondien, Reichle, Palmer, 1997; Woodbury-Smith, 2014). In contrast, others argue that individuals with ASD have inherent protective factors *against* victimizing others, including social isolation, difficulty deceiving others, and rule-governed behavior (i.e., law abiding behavior; Murrie et al., 2002; Sevlever et al., 2013). For instance, it has been found that adults with ASD are less likely to have probation violations, most likely due to their rule governance (Cheely et al., 2012). The large number of posited factors that may contribute to victimizing behaviors is difficult to disentangle, and as such, efforts should be taken to determine these predictors empirically. As a whole, the limited research on victimization in ASD suggests that inappropriate courtship behaviors (e.g., “stalking” behaviors) are more prevalent than in the general population, though replication of the Stokes et al. (2007) study that addresses the article’s limitation (e.g., relying on parent-report rather than self-report) would strengthen the findings. Additionally, examination into the variables that predict victimizing behavior will help to determine areas on which to intervene, to avoid unintended contact with legal system.

Online Dating

The lack of success through traditional, face-to-face, courtship methods may lead individuals with ASD to pursue romantic relationships through other modalities. One such

modality is computer-mediated-communication, or online dating. Recently, online dating has become more popular since its inception as the stigma of being a tool only for “psychos,” “nerds,” or “the desperate” has become less prevalent. Instead, an alternative image, where the Internet is seen as a way to connect with others, express one’s image quickly and efficiently, and improve romantic well being, is replacing the previous image (Bargh, McKenna, & Fitzsimmons, 2002; Finkel, Eastwick, Karney, Reis, & Sprecher, 2012). It is estimated that one in five heterosexual relationship currently meet through the Internet, and online dating is now the second-most common way to meet a partner, only behind meeting someone through a friend (Finkel et al., 2012; Gibbs, Ellison, & Lai, 2011; Smith & Duggan, 2013).

Online dating offers many advantages for the general population. For one, individuals now have access to a wider network of potential partners who would have been inaccessible before (Finkel et al., 2012). Additionally, individuals do not need to leave home to find a potential date, can participate in private, access online dating at any time or on their smart phones, and have a variety of options for interacting with potential dates (i.e., chats, instant message, emails, etc.; Barak, Williams, & Fisher, 2003; Rege, 2009). Online daters also have the advantage of being able to control the time and pace of interactions and have the option to edit and rewrite comments before sending. Together, these advantages may give users a greater perception of control, making online dating a more comfortable experience than face-to-face dating scenarios (Guadango, Okdie, & Kruse, 2012; Ong, Chang, & Wang, 2011).

In contrast, online dating also has drawbacks for the general population. For one, the anonymity of online dating can lead to an increased risk of being the target of antisocial behavior (e.g., sending inappropriate content), thus leading to increased negative emotions (Guadango et al., 2012; Ong et al., 2011). There are also components of online dating that may make it more

difficult than face-to-face dating, such an overwhelming amount of potential partners, which can lead to choice overload (Farrer & Gavin, 2009; Finkel et al., 2012). Finally, online dating websites' claims of effective complex algorithms to match users have not been substantiated. These algorithms are kept private from researchers due to companies claiming unwillingness to give up competitive advantages. Researchers remain skeptical of these algorithms given the difficulty of predicting compatibility in offline settings and the literature indicating that the best predictors of dating success can only be known after the relationship begins (Finkel et al., 2012).

Online dating and autism spectrum disorder. It is unknown how often individuals with ASD use online dating as the literature in this area is scarce. However, particular movement within the field may indicate that a significant portion of the ASD population are interested in online dating. For instance, the *Adaptations* program in New York has discussed developing an online dating website specifically for individuals with ASD (Schaechter, 2012). There are numerous aspects of online dating that are advantageous to individuals with ASD: fewer social demands in online dating than traditional face-to-face dating (e.g., eye-contact), fewer nonverbal communication interpretation (e.g., body language), more time to process information, more control over self-presentation, and a slower pace of communication (Nichols, Moravcik & Tetenbaum, 2009). Unfortunately, in addition to the drawbacks discussed for the general population, there are many aspects to online dating that would make it difficult for individuals with ASD to date successfully. The online dating environment presents many unwritten social rules and subtle social customs that, due to their social deficits, individuals with ASD may have difficulty comprehending.

To date, there has been one peer-reviewed examination of the online dating behavior of adults with ASD, conducted by the first author of this paper (Roth & Gillis, 2014). Adults with

ASD ($N=17$, $M_{\text{age}}=29.6$, $SD=8.2$), 19 years and older, were recruited for an online survey that asked about their online dating behaviors and attitudes. The sample included both males ($n=6$) and females ($n=11$). Overall, nine participants (53%) indicated that they have tried online dating in the past, with four participants having a long-term relationship from online dating. Out of the eight participants who indicated the length of time they have been online dating, six noted that they have used online dating for over one year. In response to being asked whether it was easier or harder to meet people through online dating (13 responses), six participants (46%) indicated it was easier, three participants (23%) indicated it was harder, and three participants (31%) indicated no difference. Additionally, out of the eight participants who responded to the question, “How does the number of dates through online dating compare to your expectations?” half noted it was less than expected and half noted the same as expected. The participants reported numerous aspects of online dating that they found beneficial including being able to court people over the computer and avoiding difficult social tasks. In addition to the benefits listed above, users noted drawbacks to online dating and the reasons they have not tried these services, which included safety concerns and the use of written communication.

Given limited literature on online dating and ASD, the following section will discuss the literature on online dating in the typically developing adult population (e.g., creating profiles, reading profiles, initial contact, personal disclosure, and face-to-face meetings) and the potential generality of these findings to the ASD population, including how adults with ASD reported on these topics in the Roth and Gillis (2014) survey.

Creating a profile. When creating profiles, online daters face the difficult task of balancing privacy versus revealing enough information for them to stand out from others (Gibbs et al., 2011). In addition, online daters balance exaggerating parts of themselves to stand out

(e.g., using glamour shots of themselves) versus outright lying (Whitty, 2007). These types of “social balancing acts” may be difficult for individuals with ASD to execute successfully due to the rule-governed behavior characteristic of the population (e.g., always telling the truth) and difficulty deceiving others. There are also unwritten social rules when developing profiles that may need to be explicitly stated to individuals with ASD, considering the data indicate that individuals with ASD generally have less sexuality-related knowledge (Hénault & Attwood, 2002; Ousley & Mesibov, 1991) and engage in less social learning about romantic relationships than their typically developing peers (Brown-Lavoie et al., 2014; Stokes et al., 2007). For example, it is expected that online daters post a picture of themselves. Otherwise, potential partners may suspect that the user does not use the site often, is a spammer, or is attempting to hide something (Finkel et al., 2012).

Reading profiles. Given the lack of social cues embedded in an online dating profile, it may be difficult for individuals with ASD to encode profiles to glean an accurate impression of someone. In the typically developing literature, a common strategy has developed for reading online dating profiles; however, it is uncertain if individuals with ASD are aware of this strategy. To explain how individuals encode online dating profiles, psychologists use the *social information processing theory*, which states that individuals adapt their efforts to acquire social information using whatever cues a medium provides (Farrer & Gavin, 2009). Specifically, since online daters are only able to communicate within the limitations of the medium, users employ reductionist strategies, such as content and linguistic tactics (e.g., using grammar as a way to determine education), to compensate for a lack of social cues (Ellison, Heino, & Gibbs, 2006; Finkel et al., 2012; Gibbs et al., 2011). Users may also rely on a technique referred to as “warranting” to confirm the veracity of information presented in the profile with anchors in the

physical world (e.g., “Googling” information from the profile; Gibbs et al., 2011). Individuals with ASD may not engage in such reductionist strategies for a number of reasons, such as an unquestioning trust of others or a lack of social learning about these practices from their peers due to social isolation.

Deception. Another consideration when viewing online dating profiles is others’ use of impression management, often in the form of misrepresentation and deception, which has found to be a common phenomenon across genders (Ellison, Hancock, & Toma, 2012; Ellison et al., 2006; Toma, Hancock & Ellison, 2008; Whitty, 2007). For instance, men have been found to misrepresent height, personal assets, attributes, and age, while females have been found to misrepresent their weight (Hall, Park, Song, & Cody, 2010; Hitsch, Hortacsu, & Ariely, 2010; Toma et al., 2008). Both men and women are also less likely to update profiles if their presentation changed toward the negative (e.g., gained weight) and are often found to use nonequivocal descriptive statements about themselves that are neither true nor false (e.g., “average” body; Ellison et al., 2012). Interestingly, though people are aware that others engage in online deception, they generally find this practice unacceptable and are often “outraged” to learn that a potential partner lied on their profile (Toma et al., 2008; Whitty, 2007).

A popular model to explain the use of deception in online dating is the *hyperpersonal* model, which originates from the social psychology field. The hyperpersonal model posits that individuals use selective information to portray themselves in a positive light and construct a self in their profile that they want to achieve in the future. Since others will be viewing the profile in the future, the online dater finds it acceptable to present this future self and state small differences in both malleable characteristics (e.g., hairstyle), and stable characteristics (e.g., stating one is 6’0 when they are in reality 5’11; Ellison et al., 2012). Researchers believe that

readers of online dating profiles should not view profiles as an exact portrayal of the person but as a “promise” that the individual presented in the profile does not fundamentally differ than a reality (Ellison et al., 2012; Jiang, Bazarova & Hancock, 2011). This suggests that it is a difficult task to discern deception versus truth (Goh, Phillips & Blaszczynski, 2011; Tufekci, 2008). There has not been an examination to determine whether individuals with ASD are aware of these social rules; however, the Roth and Gillis (2014) online survey revealed that adults with ASD endorsed deception as the most common concern regarding online dating.

Initial contact. In the general population, a consistent pattern of early communication in online dating has emerged. First, most attempts to contact a potential partner are not replied to, as such, it is important not to follow-up too many times as this could be considered “stalking” behavior. Given the results of Stokes et al. (2007), individuals with ASD may unfortunately engage in such overwhelming “follow-up” behavior. However, once both partners introduce themselves, communication occurs at a slow pace (i.e., introductory emails may follow a “virtual kiss”). The communication then develops into frequent question asking and self-disclosure (Farrer & Gavin, 2009). According to the *social penetration theory*, from the social psychology field, self-disclosure functions as way to intensify intimacy in an online setting (Finkel et al., 2012; Jiang et al., 2011). Considering the social deficits of ASD, such as asking questions (a common target in social skills interventions), their communication pattern may not follow a similar course. Instead, inappropriate behavior, such asking personal questions too soon, or quick self-disclosure, may be likely for this population. These concerns were evident in the online survey as some of the participants noted difficulties with initial contact and developing intimacy (Roth & Gillis, 2014).

Boundaries.

Victimization. There are numerous concerns with setting boundaries for the ASD population using online dating. In the general population, there are concerns with individuals having loose boundaries, specifically accepting requests to meet unknown people, who may be a cyberstalker or Internet predator (Gibbs et al., 2011). It would be expected that these concerns are applicable to the ASD population as well. Presently, there are few studies that examined cyber victimization solely in adult populations. However, in a survey of users of two social media sites in Germany that included adults in the sample (range of ages were 10 to 50 years [$M=24.4$]), the sample endorsed experiencing a number of different types of online victimization: verbal harassment (e.g., insults; 81%), sexual harassment (e.g., asking intimate questions; 68%), stalking (39%), flaming (e.g., left inappropriate answers to posts; 53%), denigration (e.g., spreading lies; 53%), impersonation (16%), outing and trickery (e.g., distributed embarrassing material; 20%), and exclusion (22%; Staude-Müller et al., 2012). Half of those experiencing victimization reported multiple victimization events (at least three different offenses) with the age group 16 to 25 years endorsing the most victimization (Staude-Müller et al., 2012). A similar examination of online victimization experiences (e.g., Staude-Müller et al., 2012) is needed for the ASD population to assess whether the social deficits of the disorder increase the population's vulnerability when using the Internet.

When meeting someone face-to-face from the Internet, individuals typically develop a risk management plan (e.g., meeting in public places and sharing the meeting places with others; Couch & Liamputtong, 2007; Finkel et al., 2012); however, it is unknown whether individuals with ASD use such safety measures. Given the safety concerns for the population, it is probable that risk management plans are not developed independently, thus teaching individuals how to

appropriately assess potential threats and how to protect oneself is recommended (Staude-Müller et al., 2012). Although the safety skills of the ASD population are unknown empirically, victimization was a noted concern for individuals with ASD in the Roth and Gillis' online dating survey (2014). In response to the question, "Do you have safety concerns about online dating?" 13 out of the 16 participants (81%) endorsed having concerns. A significant minority of the sample, six out of 15 participants (40%), indicated that they take precautions to protect themselves. Notably, while many of the responses were appropriate ("Not using my real name, withholding certain demographic information" and "Meet in a public place"), two responses to this safety question appeared problematic and may put the participants at a higher risk for victimization: "Meet the person as soon as possible and get to know their family and friends," and "I generally just play everything by gut feeling." Finally, in response to the question, "Have you been taught safety precautions for online dating?" which received 15 responses, slightly more than half indicated they have not been taught (53%). For those that were taught, seven indicated that they taught themselves through reading on their own, three participants learned through the media/Internet, and three participants were taught online dating safety from their parents, which may be problematic as the validity of these sources are unknown.

Premature request for meeting face-to-face. Loose boundaries may also be problematic for adults with ASD in that they may ask a potential partner to meet face-to-face prior to developing a stable online relationship. Asking to meet face-to-face prematurely may cause the potential partner to feel uncomfortable and in turn terminate the budding relationship. Meeting a potential partner face-to-face for the first time appears to be a critical event in a relationship, as online interactions only serves to create initial intimacy and cannot fully develop until the individuals meet face-to-face (Whitty, 2007). Successfully transitioning from online dating to a

face-to-face meeting is aided by a foundation of exchanges of information, thoughts, and feelings that may require patience on the part of both partners (Finkel et al., 2012). Recent examinations found that computer mediated communication moves to face-to-face meetings typically within a month, with people potentially meeting within a week or two (Finkel et al., 2012; Whitty, 2007). In the authors' clinical experience, adolescents and adults with ASD have stated desires to meet others face-to-face that they met online immediately, without ensuring a solid foundation of intimacy, or without detailed planning.

Frauds and scams. Finally, the social deficits of ASD may put the population at risk for being taken advantage of by those engaging in fraudulent behavior. There are a multitude of scams that one can face over the Internet including: a) individuals who are married attempting to find other partners; b) individuals posing as the opposite sex to lead on and deceive others c) pornography sites attempting to find subscribers; and d) individuals seeking money (e.g., asking for plane fare to meet in person or for an emergency hospital stay) or financial information (e.g., credit card information). The most recent statistics show that the average scam on online dating websites cost individuals more than \$3,000 in 2007. Unfortunately, the online dating industry is not regulated, thus, they are an ideal context for those to engage in fraudulent behaviors (Finkel et al., 2012; Rege, 2009). The prevalence of online scams on dating websites may be problematic for the ASD population due to the unquestioning compliance characteristic of the disorder, which may lead to complying with fraudulent requests (Sevlever et al., 2013). Interestingly, the online dating survey revealed that seven participants (out of the 16 who answered the item) endorsed preferring "free websites" (do not require a paid subscription); however, since "free" websites typically do not use screening procedures, individuals may be more likely to be approached by

others attempting to engage in fraudulent behaviors than those using paid websites (Roth & Gillis, 2014).

Information-Motivation-Behavioral Skills (IMB) Model

As the previous sections suggested, conceptually, adults with ASD appear to be at high risk of victimization while online dating. However, there is no empirical evidence that demonstrates this risk. An appealing model that may help determine victimization risk of the ASD population is the *information-motivation-behavioral skills* (IMB) model. The IMB model assumes that there are three fundamental prerequisites to engage in preventative risk reduction behaviors (Barak et al., 2003; Robertson, Stein, & Baird-Thomas, 2006; Sharma, 2012). The first prerequisite is *information*, the more information the person has, the greater likelihood of engaging in preventative behavior. The second prerequisite is *motivation* to engage in the behavior, which includes personal motivation (attitudes and personal vulnerability) and social motivation (social norms and perception of support). The final prerequisite is to engage in risk prevention is *behavioral skills*, which includes performance (objective skills) and the sense of self-efficacy or belief that one can enact those behaviors effectively (Barak et al., 2003). Therefore, an individual with ASD may be more likely to engage in effective risk prevention behaviors if he or she is well informed about the risk in online dating, is well motivated to take precautions while online dating, and possesses relevant behavioral skills to respond to risky online dating situations.

The relationship between information, motivation, behavioral skills and risk prevention has been empirically validated and the model constructs are noted to be transferable to any population (Barak et al., 2003; Robertson et al., 2006; Sharma, 2012). The IMB model, for example, has been found to predict condom use in a sample of gay men and juvenile offenders

(Nostlinger et al., 2011; Roberston et al., 2006). In the general population, interventions targeting the IMB constructs have been found effective in increasing medication adherence and reducing risky sexual behavior (Carey et al., 1997; Konkle-Parker, Erlen, Dubbert & May, 2012; Zarani et al., 2010). However, there are some criticisms of the model. First, information has been found to be an inconsistent predictor of behavior change. Additionally, information and motivation are often not mutually exclusive. Finally, the model does not consider environmental or cultural factors, which may be important for predicting behavior (Nostlinger et al., 2011; Sharma, 2012). Overall, despite its limitations, the IMB model appears to warrant further investigation as a potentially promising approach for assessing the risk of individuals with ASD that online date.

Summary and Current Study

Due to the social impairments characteristic of the disorder, adults with ASD have difficulty dating and establishing romantic relationships (Byers et al., 2013a; Gilmour et al., 2012; Hellemens et al., 2007; Jennes-Coussens et al., 2006), though the literature has shown that this population has considerable interest in such relationships (Gilmour et al., 2012; Hellemens et al., 2007; Hénault & Attwood, 2002; Lunsy & Konstantareas, 1998). Difficulty with traditional, face-to-face dating methods may make online dating appealing for this population. However, this population may have difficulty comprehending the unwritten social rules and customs of online dating (e.g., how to create and read a profile, make initial contact, and requesting a face to face meeting) and be at risk for victimization and/or victimizing others, though there has been minimal empirical attempts to determine the risk for the ASD population. To date, the only study examining inappropriate courtship behaviors (i.e., “stalking”) indicated that individuals with ASD are more likely to court others inappropriately and for longer than typically developing peers (Stokes et al., 2007). Additionally, there has been one recent study on victimization in

adults with ASD, which yielded higher rates for the ASD sample, however the study did not inquire about victimization in online settings (Brown-Lavoie et al., 2014). Currently, there has been no comprehensive examination of online dating or online victimization in the ASD population.

An examination of online dating and online safety skills in the ASD population would be beneficial for the field to determine whether online dating safety should be a target for intervention. Although professionals and individuals with ASD have published books with advice on dating and safety for the ASD population (e.g., Carley, 2008; Lawson, 2005; Newport & Newport, 2002; Nichols et al., 2009; Ramey & Ramey, 2008; Zaks, 2006), there has not been an empirical, peer-reviewed program on dating or online dating for individuals with ASD, despite previous research showing that individuals with ASD are less informed about sexuality related topics (Brown-Lavoie et al., 2014; Hénault & Attwood, 2002; Ousley & Mesibov, 1993) and have fewer sources from which to learn about romantic relationships (Brown-Lavoie et al., 2014; Stokes et al., 2007). Online dating is a complex collection of different behaviors and without supports, individuals with ASD may continue to have difficulty establishing romantic relationships and/or remain at risk for victimization/victimizing others. Although it could be argued that all individuals that online date would benefit from such an intervention, the core deficits of ASD appear to present *idiosyncratic barriers* to remaining safe and dating successfully (e.g., difficulty recognizing deception, identifying potentially dangerous individuals and frauds/scams, disclosing/inquiring about personal information at an appropriate time, developing intense interests toward others, and stalking others). However, without determining the extent to which the core deficits of ASD predict victimization risk and the extent to which

individuals differ from their typically developing peers, such an intervention would be difficult to develop.

Objective one. The current study has two objectives. The primary objective of the study is to comprehensively examine online dating skills in young adults with ASD as compared to a control group of typically developing adults (TDA). There are numerous aims within this objective. The first aim is to establish the prevalence of online dating for young adults with ASD. The specific hypotheses for this aim were as followed:

- It was expected that young adults with ASD would have less previous face-to-face and online dating experiences than the TDA group (ASD < TDA).
- It was expected that young adults with ASD and the TDA group would not differ in previous use of online dating websites (ASD = TDA).
- It was expected that young adults with ASD would have fewer sources for learning about romantic relationships than the TDA group (ASD < TDA).

The second and third aims are to assess online dating safety skills and inappropriate courtship behaviors in young adults with ASD. To accomplish these aims, young adults with ASD will be compared to a control group of TDA in order to better understand differences between these populations. The specific hypotheses for these aims were as follows:

- It was expected that young adults with ASD would have experienced more previous online victimization than the TDA group (ASD > TDA).
- It was expected that young adult with ASD would engage in more inappropriate courtship behaviors when attempting to initiate romantic relationships than the TDA group (ASD > TDA).

- It was expected that young adults with ASD would pursue potential romantic partners longer in the face of negative responses or no response than the TDA group (ASD > TDA).
- It was expected that the two groups would differ on particular IMB variables. Specifically, though it was expected that the two groups would have equal rates of motivation to remain safe while online (ASD=TDA), the ASD group was expected to have less knowledge of online dating (ASD<TDA) and behavioral skills in response to risky online dating situations (ASD<TDA).

Objective two. The second objective of the study is to examine the relationship between the severity of ASD impairment and online victimization. To accomplish this objective, ASD impairment will be evaluated on its ability to predict online victimization history and inappropriate courtship behaviors (e.g., “stalking” behaviors). The specific hypotheses for this objective were as followed:

- It is expected that the social communication deficits of ASD will be significant predictors of victimization risk.
- It was expected that core deficits of ASD, particularly intense interests, will be significant predictors of inappropriate courtship behaviors toward others.

Method

Participants

A total of 30 adults with ASD and 56 typically developing adults (TDA) participated in the current study. The study utilized a mixed-group design to compare the ASD and TDA groups. The inclusionary criteria for the ASD group included: a) a reported DSM-5 diagnosis of ASD *or* DSM-IV-TR diagnosis of Autistic disorder, Asperger's disorder, Pervasive Developmental Disorder-Not Otherwise Specified, which was determined via self-report *and* scoring above the cutoff on the *Autism-Spectrum Quotient* (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001), *and Social Responsiveness Scale, second edition* (SRS-2, Constantino & Gruber, 2012); and b) an age between 19 years and 30 years. Participants were required to meet criteria on both the AQ and SRS-2 for multiple reasons. For one, the complexity and difficulty in accurately diagnosing ASD in adulthood (e.g., differentiating ASD from other diagnoses such as social anxiety) has been established in the literature (Trammell, Wilczynski, Dale, & McIntosh, 2013). In addition, participants were mostly recruited from the community (i.e., not clinical settings) and questions about the validity of the diagnosis were raised. Finally, researchers have noted the limitations of solely relying on the AQ (i.e., one diagnostic screener) without further verification in survey research with adults with ASD and have called for future studies to take additional steps to verify ASD diagnoses (Brown-Lavoie et al., 2014, Mazurek, 2013). For these reasons, it was decided that meeting criteria on both the AQ and SRS-2 would improve on previous survey research with adults with ASD. The inclusionary criteria for the TDA control group included: a) the absence of an ASD or other developmental disabilities (e.g., intellectual disability) via self-report; and b) an age between 19 and 30 years. One exclusionary criterion for the TDA group included a diagnosis of a severe mental illness (e.g., schizophrenia).

Participants with ASD were recruited from a number of sources from a mid-Atlantic university and a mid-Atlantic major metropolitan area. Specifically, participants were recruited from clinicians that work with individuals with ASD, support-groups of adults with ASD, organizations that serve individuals with ASD, regional conferences, the university's services for students with disabilities, and community establishments in which individuals with ASD would frequent (e.g., libraries, comic book stores, video game shops, and gaming shops). Participants for the TDA group were recruited using the university's Experimatrix system (used for undergraduate students completing studies for course credit), the university's graduate student organization, and the community (e.g., coffee-shops and restaurants).

Initially, participants were recruited to complete an in-person research battery from November 2013 to April 2014. A total of 49 participants were recruited in this phase of the study (46 participants for the TDA group and three participants for the ASD group). There were significant difficulties recruiting adults with ASD for the in-person research session. As a result, it was decided to switch the study to an online study as a way to boost recruitment (i.e., reduced response effort required by participants by completing the study from home). The data from the in-person data collection will be used for additional studies in validation analyses of the researcher-developed instruments and were not used in the current study (see *Measures* section for descriptions).

Institutional Review Board approval for online study was granted in May 2014, which allowed the researcher to widen recruitment nationally. Therefore, in addition to the sources of recruitment listed above, recruitment of adults with ASD was expanded to other support organizations for individuals with ASD, support groups for adults with ASD in other states, college programs for students with ASD, and through Meetup.com groups for adults with ASD.

Participants for the online TDA group were recruited using the same sources as in the in-person portion of the study (university's Experimentrix system and graduate student organization). Given the small number of participants with ASD from the in-person portion of the study ($n=3$), it was decided to collapse them into the online portion of the sample, to maximize the sample size. The online data collection lasted from May 2014 to November 2014.

Overall, 130 participants were recruited for the online data collection (see Table 1 and Table 2 for a summary of the demographic information). A graphical depiction of the assignment of participants to groups can be found in Figure 1. Thirty seven ($n=37$) adults indicated that they had been diagnosed with an ASD, 69 adults indicated that they had not been diagnosed with ASD, and 24 individuals did not answer the question and were not included in the final sample. A number of participants ($n=25$) were excluded for significant non-completion (i.e., 33% or more incomplete data), which included one participant with ASD, two TDA participants, and 22 participants that did not identify if they had been diagnosed with an ASD.

In addition to the exclusion for non-completion, eight participants in the TDA group were excluded from the analyses for scoring above the cutoff on both the AQ and SRS-2. There were a total of 56 participants in the TDA group. The mean age of the TDA sample was 21.18 years ($SD=3.02$, $range = 19-30$) with an average AQ Total Score of 16.55 (subclinical; $SD=6.55$, $range=0-37$) and a SRS-2 Total T-score of 50.52 (subclinical; $SD=6.93$, $range=40-69$). The sample was predominately female (82.1%) with considerably fewer males (16.1%); one participant identified as transgender (1.8%). The majority of the sample identified as Caucasian (69.6%) with a number of other identified ethnicities (Asian/Pacific Islander, African American, American Indian/Alaskan Native, Hispanic, and biracial). Most of the sample identified as heterosexual (89.3%). With regard to relationships status, most participants reported they were

single (80.4%). Few participants reported a non-ASD DSM diagnosis (20.7%), which included depression, anxiety disorder, attention-deficit/hyperactivity disorder, and an eating disorder. Most participants (89.3%) were currently a student. A minority portion of the sample was employed (39.3%), mostly in retail, as a graduate assistant/research assistant, teacher's assistant, or waitress. Finally, most of the sample lived in college housing (37.5%).

Out of the 37 individuals with ASD that completed the study, nine were excluded for not meeting inclusionary criteria. Four participants scored lower than the cutoff on the AQ, one participant scored lower than the criteria on the SRS-2, three participants did not meet criteria on either the AQ or SRS-2, and one participant did not complete the AQ and SRS-2. Two participants that did not answer the question if they were diagnosed with an ASD, but scored above the cutoff on both the AQ *and* SRS-2 and were included in the ASD group. The final ASD sample ($n=30$) had a mean age of 23.92 ($SD=3.23$, $range=19-29$), with an average AQ Total Score of 33.50 (clinical range; ($SD=5.17$, $range = 26-44$) and an SRS-2 Total T-score of 73.50 (clinical range, moderate impairment; $SD=7.86$, $range=61-88$). The sample was majority male (56.7%) with fewer females (33.3%); one participant (3.6%) identified as transgender. The majority of the sample identified as Caucasian (73.3%) with a number of other identified ethnicities (Asian/Pacific Islander, African American, Hispanic, and biracial). With regard to sexual orientation, though the sample primarily identified as heterosexual (73.3%), there were a number of additional identified orientations (bisexual, asexual, pansexual, and uncertain). Most of the sample was single (76.7%). The majority of the ASD sample also reported a non-ASD DSM diagnosis (73.3%), which included anxiety disorder, depression, attention-deficit/hyperactivity disorder, learning disability, bipolar disorder, and schizoaffective disorder. Slightly less than half of the sample was currently a student (43.3%). In addition, a little less than

half of the sample was employed (43.3%), with a variety of jobs across administration, retail, and security. With regard to their living situations, most participants lived with their family (56.7%).

The two groups were compared on a number of variables to determine if there were differences. For quantitative information, independent sample t-tests were utilized. For qualitative information (categorical data), chi-square tests of differences were utilized. When possible, categories were collapsed into two categories for the chi-square tests to increase the power of the analyses. Summaries of these analyses can be found in Table 1 and Table 3. Results revealed that the TDA group and ASD group significantly differed in age, $t(79)=3.73, p<.001$ ($d=.87$, large effect). As expected, the ASD group and TDA group differed significantly on the AQ Total Score, $t(83)=13.95, p<.001$ ($d=3.12$, large effect). In addition, the ASD group and the TDA group differed significantly on the SRS-2 Total Score, $t(84)=13.99, p<.001$ ($d=3.10$, large effect). With regard to the categorical data, the two groups differed in gender, $\chi^2(2, N=84) = 18.305, p<.001$ ($\phi=.467$, moderate relationship), if they were currently a student, $\chi^2(1, N=83)=20.071, p<.001$ ($\phi =-.492$, moderate relationships), and other DSM diagnoses, $\chi^2(1, N=84)=25.30, p<.001$ ($\phi =.549$, strong relationship). They did not differ in level of education, identified sexual orientation, identified ethnicity, relationship status, highest education, living situation, or employment status.

Measures

The *Autism Spectrum Quotient* (AQ; Baron-Cohen et al., 2001) was administered in order to assess for the presence and severity of ASD. The AQ was developed to be a short, self-administered instrument available for adults with average cognitive abilities to assess “autistic traits.” The measure is comprised of 50 questions that assess five areas of ASD impairment and associated cognitive abnormalities: social skills, attention switching, attention to detail,

communication, and imagination. Answers are presented in a Likert scale that use the anchors “definitely agree,” “slightly agree,” “slightly disagree,” and “definitely disagree.” A score of 26 was used for the clinical cutoff in the current study (Woodbury-Smith, Robinson, Wheeler, & Baron-Cohen, 2005). Research on the AQ indicates the measure has adequate face validity, construct validity, test-retest reliability, and internal consistency (Baron-Cohen et al., 2001). Additionally, the AQ is not affected by IQ or socio-economic status, and has established discriminative validity between individuals with high functioning ASD and typically developing individuals (Baron-Cohen et al., 2001). The AQ takes approximately 10 minutes to complete.

To further assess for the presence and severity of ASD, the *Social Responsiveness Scale, second edition* (SRS-2; Constantino & Gruber, 2012) was administered. The SRS-2 is a brief, multirater measure designed to identify the presence and severity of social impairment within ASD and differentiate it from which it occurs in other clinical disorders. The SRS-2 focuses on social behavior that occurs in everyday context, thus, the author purports that it is able to detect slight and subtle social deficits characteristic in high functioning ASD. The SRS-2 yields a Total score and five subscales: Social Awareness, Social Cognition, Social Communication, Social Motivation, and Restricted Interests and Repetitive Behaviors. Additionally, the scale yields two DSM-5 compatible subscales: Social Communication and Interaction and Restricted Interests and Repetitive Behaviors. For the current study, the new self-report for adults 19 years or older was utilized. In regards to its psychometrics, internal consistency (.92 to .95) and interrater reliability with other observers (.61 to .78) were determined to be adequate. Although there is limited data on the use of the SRS-2 self-report, other forms of the SRS-2 (i.e., parent report) has been found to have content validity, predictive validity, concurrent validity with established ASD diagnostic scales, and discriminant validity with other clinical disorders (Bruni, 2014;

Constantino & Gruber, 2012; Conway, 2007). The SRS-2 takes between five and 10 minutes to complete. Permission to administer the SRS-2 online was granted by Western Psychological Services.

Relevant demographic information and dating history was collected using two researcher-developed self-report measures. The first measure, the *Demographic Survey*, inquired about participants' gender, age, race/ethnicity, education, type of residence, and employment status. Additionally, to partially confirm ASD diagnosis (along with scores on the AQ and SRS-2), information regarding ASD diagnosis was collected. Participants were asked when they were diagnosed with an ASD and what type of professional diagnosed them with an ASD (e.g., physician, psychiatrist, psychologist, etc.). The *Demographic Survey* takes approximately 5 minutes to complete. The *Dating History Survey* (DHS) was also used to collect relevant background information of face-to-face dating and online dating history. Specifically, the measure assessed: frequency of traditional dating, where participants sought out traditional dates, previous relationships through traditional dating, Internet literacy, experiences trying online dating, previous relationships through online dating, expectations of online dating, long-distance relationships, websites used for online dating, safety concerns when using online dating, safety precautions taken, and whether they received online dating related services in the past. The survey was modified from the Roth and Gillis (2014) online dating survey with adults with ASD to increase the standardization of the measure. Specifically, open-ended questions were taken out and key terms were operationally defined (e.g., long term relationship was defined as more than three months). The DHS takes 15 minutes to complete.

To assess sources of learning, romantic functioning, and courtship behavior, the *Courting Behavior Scale* (CBS) was utilized. The CBS was the primary scale used in the Stokes and

colleagues (2007) study on stalking behaviors and includes two sections. The first section, Social Functioning examines responses regarding socialization and peer relationships. The second section, Romantic Functioning, examines intimate romantic relationships issues. Additionally, the Romantic Functioning scale includes a 20-item checklist of behaviors used to initiate or pursue a social or romantic interests and the type of person targeted (e.g., stranger, friend, colleague, celebrity) and the frequency with which the behaviors occurred. The internal consistency of the Social Functioning ($\alpha=.90$) and Romantic Functioning scale ($\alpha=.72$) were deemed to be acceptable. Because the Stokes and colleagues (2007) study relied on parent report, the CBS was adapted to be used in a self-report format for the current study. The CBS takes approximately 10 minutes to complete.

To assess previous rates of online victimization, the scale utilized in Staude-Müller and colleagues (2012) study was used. The scale assesses prior experience with different types of online harassment in seven categories: sexual harassment, flaming, cyberstalking, denigration, impersonation, outing and trickery, and exclusion. Each category includes descriptors of the different types of victimization. Participants are required to indicate how frequently they had experienced different types of victimization on a five point scale: a) never; b) once or twice; c) three to five times; d) six to 10 times; e) more than 10 times. Psychometric properties were not available for this scale. The *Staude-Müller Scale* takes approximately 10 minutes to complete.

In order to assess the three variables of the IMB model (information, motivation, and behavioral skills) three researcher-developed instruments were administered. The content for these three IMB measures were compiled by the researcher based on anecdotal evidence, data from the Roth and Gillis (2014) survey study, clinical observations, the existing literature on online dating in the typically developing population and sexuality and ASD, non-peer reviewed

books on online dating and dating and ASD, and hypotheses of areas that would be conceptually difficult for individuals with ASD that were discussed in the *Introduction* section of this paper. Overall, the content of the scales covered four main areas: a) completing profiles and reading others' profile; b) moving from computer communication to a face-to-face meeting; c) how to deal with rejection and how to reject others; and d) identity frauds and scams.

To measure the first IMB variable, *information*, the *Internet Dating Inventory* (IDI) was administered. The IDI is a 20-item scale that assesses knowledge utilizing a multiple-choice format. Three scales were developed from the items on the IDI based on the content of the question: Social Norms, Safety Skills, and Dating Facts. The IDI takes approximately five minutes to complete (see Appendix A for the IDI). The internal consistency of the scale will be discussed in the *Results* section.

To measure the second IMB variable, *motivation*, the researcher developed the *Confidence in Your Safe Online Behaviors* (CYSOB) scale. The CYSOB is a 23-item self-report scale that was adapted from the *Condom Attitude Scale* (Lawrence, Teitman, Jefferson, Alleyne, Brasfield, & Shirley, 1994), a measure of motivation in previous IMB research (e.g., Robertson et al., 2006). The *Condom Attitude Scale* requires a fourth-grade reading level and has an acceptable internal consistency ($\alpha=.80$). The CYSOB was adapted by rewording the content from the *Condom Attitude Scale*. The scale now reads “online safety precautions” (rather than “condom use”), “being taken advantage of” (rather than “sexually transmitted disease”), and “worry” (rather than “sleeping around”). The CYSOB assesses the individual's personal motivation to engage in safety behaviors, attitudes toward using online dating safety precautions, concern over victimization, necessity for engaging in safety precautions, and perceived response effort of taking safety precautions across five scales based off of the original scale: Worry;

Perceived Risk; Interpersonal Impact; Safety; Effects on Experience. The CYSOB takes approximately five minutes to complete (See Appendix B for CYSOB). The internal consistency of the scale will be discussed in the *Results* section.

To measure the third IMB variable, *behavioral skills*, the researcher developed *the Response to Online Situations Task* (ROST), a computer delivered, behavioral assessment designed to depict naturalistic online dating situations that are potentially dangerous. The ROST is comprised of 10 online dating situations. During the task, videos depicting an online dating situation are played on a computer until a potential risk factor or trigger is shown. The screen is then paused and options of how to respond, presented in a multiple-choice format is shown on the bottom of the screen for the participant to choose. The ROST takes approximately 10 minutes to complete (see Appendix C for the ROST; see Appendix D for a screen shot of the task).

Procedure

Participants were provided a link for the study through the appropriate recruitment materials (e.g., flyer and website description). Undergraduate students that signed up for the study using Experimentrix were emailed the link by the researcher. Once participants clicked the link they were taken to the consent form that included a video of the researcher reviewing the main points of the consent form. After participants consented, a password to start the survey was provided. The research battery was administered using the *Qualtrics* survey software. The entire research battery was presented in a randomized order. The total time commitment was approximately one hour to one and a half hours, participants were able to complete the study in multiple sessions (up to seven days). At the completion of the study, the participants received remuneration of \$25 through the mail or course credit. Participants were nonrandomly assigned to either the ASD group or control group. Individuals were placed into the ASD group if: a) they

endorsed an ASD diagnosis; b) score above the cutoff (26) on the AQ; and c) scored above the cutoff on the SRS-2 (raw score of 68).

Results

Diagnostics

The dependent variables were analyzed for extreme outliers and normality (i.e., more than 3.29 standard deviations from the mean, significant incompleteness of the scale, significant response patterns). Normality was assessed using the Shapiro-Wilk test of normality. For the ASD group, one participant's CYSOB data and two participant's ROST data was removed due to incompleteness of the measures. In addition, one participant's IDI score and one participant's CYSOB scores were removed due to a significant response pattern (i.e., choosing choice 1). In the TDA group, one participant's AQ score was removed due to significant incompleteness. Results of the Shapiro-Wilk test indicated a non-normal distribution for the TDA group ROST score, $W(53)=.925, p<.01$. The ROST score underwent a reverse square root transformation. However, after the transformation, normality was still violated, $W(53)=.962, p<.05$, and as a result, the transformed scores were not used.

Internal Consistency

Internal consistency was calculated for the CYSOB, IDI, and ROST total scores. Cronbach's alpha, the most common way to measure internal consistency, was the metric calculated (Field, 2013). For the purposes of the current study, $\alpha=.60$ was decided as the cutoff for an acceptable score, given the exploratory nature of the analyses (Quadrelli, Davoudi, Galindez, & Colt, 2009). Alpha was calculated for the ASD group, TDA group, and combined ASD/TDA group. A summary of the alpha score for the datasets can be found in Table 5. The CYSOB total scale had consistently acceptable alpha scores, ranging from .86 to .91. In contrast, the ROST had alpha scores ranging from acceptable to unacceptable ($range_{\alpha}=.36-.62$) and the IDI performed poorly, yielding scores consistently in the unacceptable range ($range_{\alpha}=.47-.48$).

Follow-up analysis on the IDI and ROST examined item difficulty and the change in the Cronbach's alpha of each item. The identified difficult items (less than .25 item difficulty; Scialfa, Legare, Wenger, & Dingley, 2001) included items 6, 13, and 14 on the IDI and items 1, 2, 4, and 7 on the ROST. However, no substantial change in Cronbach's alpha was identified (i.e., more than .1) when these items (or any other items) were removed in the ASD, TDA, and combined group.

Dating Functioning and Dating History

To determine whether the groups differed in dating interest or in their previous dating history, different items on the DHS were examined using descriptive analysis. Inferential analyses were not used in order to reduce family-wise error, given the high number of analyses conducted in other areas. Both groups had high interest in dating (ASD=83.3%; TDA=92.9%) and looked for dates in a number of places, including through friends, school, coffee shops/cafes, and work. The TDA group endorsed looking for dates at bars/clubs more often while the ASD group reported looking for dates on online dating websites more often. On average, the TDA group reported more previous romantic relationships ($n=49$; $M=2.39$, $SD=2.83$, $range = 0-17$) than the ASD group ($n=19$, $M=1.63$, $SD=1.98$, $range=0-5$). When asked using a more standardized definition, "How many partners have you dated for more than three months?" again, the TDA group reported more partners ($n=51$, $M=1.67$, $SD=1.37$, $range=0-5$) than the ASD group ($n=22$, $M=1.27$, $SD=1.52$, $range=0-5$), though this approached an equal rate.

With regard to online dating, the ASD group had higher percentages of those interested in online dating (63.3%) than the TDA group (17.9%). Additionally, a higher percentage of the ASD group had previously tried online dating (63.3%), compared to the TDA group (16.1%). When asked about the number of dates obtained through online dating, the ASD group reported

more online dates ($n=10$, $M=3.50$, $SD=6.62$, $range=0-20$) than the TDA sample, who had fewer participants reporting ($n=7$, $M=1.29$, $SD=1.70$, $range=0-4$). As a whole, the ASD group reported more previous usage (in months) of online dating websites ($n=11$, $M=37.27$, $SD=45.02$, $range=1-120$) than the TDA group ($n=7$, $M=14.00$, $SD=22.63$, $range=2-48$).

Sources of Information

To determine the differences in the sources of information to learn about relationships, odds ratios between the groups were calculated using the items on the CBS, which was consistent with Stokes et al. (2007) examination in this area. A summary of the scores can be found in Table 5. Interestingly the two groups differed consistently (i.e., $OR>1$) on the same sources of information in learning about both *social* and *romantic* relationships, with the TDA group learning more from: parents, watching others, peers and friends, siblings, and the media. The groups did not differ in learning from the Internet or reading on their own.

Online Victimization

To determine differences between previous online victimization, items on the DHS and the scales on the *Staude-Müller Scale* were examined using descriptive analyses and *Cohen's d* effect size calculations. First, looking at the frequency at which these types of victimization occurred using a likert scale (never, once or twice, three to five times, six to 10 times, more than 10 times), larger rates were observed in the ASD group on the Harassment (ASD, $M=2.59$, $SD=1.32$; TDA, $M=1.89$, $SD=1.08$; $d=.58$, medium effect), Flaming (ASD, $M=2.55$, $SD=1.42$; TDA, $M=1.78$, $SD=1.12$; $d=.60$, medium effect), and Exclusion (ASD, $M=2.45$, $SD=1.45$; TDA, $M=1.64$, $SD=1.01$; $d=.65$, medium effect) scales. Smaller to minimal differences were noted on the Sexual Harassment, Cyberstalking, Denigration, Impersonation, and Outing and Trickery scales (see Figure 2). When asked about safety concerns while online dating on the DHS, the

majority of both groups reported having such safety concerns, though the TDA group had a higher percentage of endorsement (ASD=73.3%; TDA=82.2%).

With regard to previous online dating victimization both groups reported few such incidents. In the ASD group, three participants reported previously being taken advantage of using online dating. Specifically, a partner reportedly told one participant that they were interested in a long-term relationship, however when they met, the partner was pushy about sexual relationships. Another participant reported that one partner attempted to scam them financially. In the TDA group, one participant indicated they were previously taken advantage of using online dating where they were “catfished” and the other person threatened to “find them and do terrible things.”

Courting Behaviors

To determine group differences in courting behaviors, the total score on the CBS pursuing section was examined. Originally, chi-square analyses were planned, however the assumptions of chi-square analyses were violated in that there were zero responses in the cells. As a result, a non-parametric Mann Whitney-U test was conducted, using the number of courting behaviors endorsed. The two groups did not differ on the overall number of courting behaviors, respectively, ASD ($M=10.33$, $SD=15.53$), TDA ($M=8.98$, $SD=6.72$), $U(86)=726.50$, $p=.30$, $d=.18$ (weak effect). Further inspection of the data, using visual analysis, indicated that though the groups had an equal overall number of courting behaviors, the TDA endorsed more instances of appropriate courting, including telephoning and initiating social contact. The ASD group endorsed more inappropriate courting behaviors, including showing obsessional interests, making inappropriate gestures/comments, stealing/damaging property, touching someone inappropriately, making threats, and persistently pursuing someone that could be seen as

threatening (see Figure 3). In addition, examination of the targets toward the courting behavior show that the ASD group targeted strangers slightly more while the TDA group targets friends, celebrities, and ex-partners more (see Figure 4).

To examine whether the groups differed in the length of time they pursued a potential partner, in the face of negative responses, three questions on the CBS were examined. The ordinal data (never, a few days, a few weeks, or a months) was analyzed using Mann-Whitney U tests. A Bonferroni error correction rate of .02 was used to adjust for familywise error. No differences were found between the lengths of time pursuing a partner. The groups did not differ in how long they would pursue in the face of no response from the person, ASD ($M=1.92$, $SD=.85$), TDA ($M=1.70$, $SD=.60$), $U(80)=615.00$, $p=.32$, $r=.15$ (small effect), in the face of a negative response, ASD ($M=1.38$, $SD=.75$), TDA ($M=1.39$, $SD=.74$), $U(80)=683.00$, $p=.80$, $r<.01$ (small effect), or negative response from the person's friends or family, ASD ($M=1.69$, $SD=1.05$), TDA ($M=1.83$, $SD=.86$) $U(80)=593.00$, $p=.227$, $r=.07$ (small effect). Neither group reported involvement in the criminal justice system regarding a dating incident.

IMB Variables

To determine if adults with ASD and TDA differed in risk of online dating victimization, group differences were examined on the IMB variables using analysis of variance. First, to confirm that the ASD and TDA groups did not differ on the motivation to remain safe online, the CYSOB total score was examined using an one way analysis of covariance (ANCOVA), entering age and gender as covariates. Standardized residuals were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$). There was homogeneity of variances, as assessed by Levene's test of homogeneity of variance ($p= .563$). The CYSOB score was not significantly different for the

ASD ($M=91.75$, $SD=13.43$) and TDA ($M=95.37$, $SD=10.79$) groups, $F(1,70) = .64$, $p=.462$, $\eta^2=.05$ (small effect).

To determine whether the groups differed on online dating related information and behavioral skills, a one-way multivariate analysis of covariance (MANCOVA) was conducted to determine the effect of group assignment (ASD and TDA) on the IDI and ROST. It was expected the ASD group would score lower on these variables. Again, age and gender were entered as covariates. Given the differences in sample size, Pillai's Trace (Λ_{Pillai}) was used as the test statistic. There were no multivariate outliers in the data, as assessed by Mahalanobis distance ($p>.001$). Analysis showed that there was homogeneity of variance-covariance matrices by Box's test of equality of covariance matrices ($p=.09$). There was homogeneity of variances as assessed by Levene's Test of Homogeneity of variances ($p>.05$). The main effect between the groups was statistically significant $F(2, 68)=3.26$, $p=.04$, $\Lambda_{Pillai}=.09$, $\eta^2=.09$ (small effect). Follow-up univariate ANOVA analyses (using a Bonferroni error correction rate of .03) revealed that the groups differed on the ROST score, ASD ($M=5.78$, $SD=2.5$), TDA ($M=7.3$, $SD=2.0$), $F(1, 69)=6.19$, $p=.01$, $\eta^2=.08$ (small effect). The groups did not differ on the IDI, ASD ($M=9.96$, $SD=3.75$), TDA ($M=10.70$, $SD=2.58$), $F(1,69)=.61$, $p=.44$, $\eta^2=.01$ (small effect). Further examination of the individual questions on the ROST (see Figure 5) revealed the ASD group scored lower on all but one item on the scale, question three (a potential partner is sending outdated photographs of themselves). Noted differences were observed on question six (chatting with a potential partner for months but they constantly cancel plans to meet in person at the last minute), question eight (online partner becomes upset when you plan to tell a friend about your date), question nine (someone claims to be a wealthy business entrepreneur but has an odd profile) and question ten (a potential partner has a Facebook page with nothing else on the page).

Predictors of Online Victimization

Given that the ASD and TDA group differed in behavioral skills, a multiple regression was conducted to determine which social communication skill deficits of ASD were most predictive of previous online victimization. Specifically, the scales on the SRS-2 Social Communication and Interaction domain (Social Awareness, Social Cognition, Social Communication, and Social Motivation) were entered as predictors while the total endorsed score on the *Staude-Müller Scale* was entered as the dependent variable for the ASD group only. The assumptions of linearity, homoscedasticity, unusual points and normality of residuals were met. There was independence of residuals, as assessed by a Durbin-Watson statistic (2.12). Given the nature of the analyses, a backward multiple regression analysis was conducted to determine the most influential variables. The results of the regression analyses can be found in Table 6. The full model was not found to be significant, $F(5,24)=1.73$, $p=.13$, *adjusted* $r^2=.09$. However, the final two models were significant. In model three, $F(2, 27)=3.51$, $p=.04$, *adjusted* $r^2=.15$, the predictors included the Social Cognition ($\beta=.07$, $p=.48$) and Social Awareness ($\beta=.32$, $p=.05$) scales. In model four, $F(1, 28) = 6.61$, $p =.02$, *adjusted* $r^2 = .16$, the predictor included the Social Awareness scale ($\beta =.36$, $p =.02$). In contrast, the same backward multiple regression analysis was conducted with the TDA sample. The full model was not found to be significant $F(4, 51)=.98$, $p=.43$ *adjusted* $r^2=.04$. No predictors were found to be significant in any of the models, indicating that the Social Awareness scale is a unique predictor to the ASD sample.

Additional variables were tested using model four (Social Awareness), which had the highest explained variance. When the number of dates was added as a predictor, the model was significant $F(2, 21)$, $p=<.01$, *adjusted* $r^2=.36$, ($\Delta r^2=.20$). The number of dates found to be

negatively correlated ($\beta = -.05$, $partial-r = -.18$, $p = .44$) to the *Staude Müller Scale*. Again, the Social Awareness score was found to be a significant predictor ($\beta = .56$, $p < .01$). Conversely, when age and interest in dating were entered in the model, the results were not significant.

In addition, potential moderators were explored. When the interaction between gender and the Social Awareness score was examined, multicollinearity was violated and the studentized residuals were not normally distributed, as assessed by Shapiro Wilk's test ($p < .01$). Therefore, the data were centered and transformed using a log transformation. The transformation led to an absence of multicollinearity, however the studentized residuals were still not normally distributed ($p < .01$). Gender did not moderate the effect on the *Staude-Müller Scale* ($\Delta r^2 = .05$), $F(3, 26) = 2.11$, $p = .12$. In addition, the participants having safety concerns toward online dating and participants taking safety precautions in online dating did not moderate scores on the *Staude-Müller Scale*.

Predictors of Inappropriate Courting Behavior

It was also predicted that the social communication skill deficits and RRBs of ASD would be predictive of inappropriate courtship behaviors. The two indices on the SRS-2, the Social Communication Interaction Index (the four scales were combined to reduce the number of predictors) and the Restricted Interests and Repetitive Behavior Index, were entered as predictors for the ASD group only. For the dependent variable, the total score from the CBS pursuing section was recalculated, subtracting the appropriate behaviors from the total endorsed score: telephone, sent letters/email, sent gifts, and attempted to initiate social contact. The assumptions of linearity, independence of errors, homoscedasticity, unusual points and normality of residuals were met. There was independence of residuals, as assessed by a Durbin-Watson statistic (2.27). One data point had a standardized residual above three standard deviations and was removed

from the analysis. The results of the model can be found in Table 7. The full model was significant, $F(2,53)=3.54$ $p=.04$, *adjusted* $r^2=.15$. One predictor was found to be significant, the Social Communication and Interaction domain ($\beta=.40$, $p=.02$) while the Restricted Interests and Repetitive Behavior domain was not a significant predictor ($\beta =-.39$, $p=.39$). In contrast, when the regression was rerun with the TDA sample, the model was not significant $F(2, 53)=.20$, $p=.82$, *adjusted* $r^2=-.03$. None of the predictors were significant.

Discussion

Knowledge about dating skills in young adults with ASD has received increased, albeit limited, attention in recent years. This study sought out to comprehensively examine online dating skills in young adults with ASD. The study had two main objectives. The primary objective of this study was to provide information about the prevalence of online dating for young adults with ASD and assess sources of information to learn about online dating, previous online victimization, inappropriate courting behaviors, online dating knowledge, motivation to remain safe online, dating, and online dating skills and safety skills. The secondary objective of this study was to examine the relationship between the severity of ASD impairment and online victimization and inappropriate courting. The following sections will review the results of the study in detail, in order of the study objectives stated above, followed by a discussion of the study strengths, limitations, and future directions.

Objective One

Dating functioning and dating history. As a whole, using visual analysis, the TDA group reported higher rates previous relationships (80.4% versus 59.1%) and relationships longer than three months, though this number was more similar between the groups. Surprisingly, the ASD group had more dates from online dating, on average, than the TDA group. However, this may have been confounded by a number of variables. Specifically, the ASD group was older, had more interest in online dating, and tried online dating for longer than the TDA group. Overall, these findings may be a result of a self-selected sample of individuals with ASD versus a more random sample of TDA.

Interestingly, the percentage of adults with ASD in the current study that previously tried online dating (46.7%) approximated the percent of adults with ASD who reported trying online

dating in the original online dating survey study (53%; Roth & Gillis, 2014). Taken together, it appears that a significant portion of young adults with ASD that are interested in dating use online dating at a rate somewhat exceeds the 38% of adults in the general population that are interested in dating and use online dating, as measured by the latest *Pew Research* poll on online dating (Smith & Duggan, 2013). However, it should be noted that both studies had small sample sizes and additional replication is needed. As a whole, the current study, the original online survey (Roth & Gillis, 2014), and other recent surveys of adults with ASD (e.g., Byers et al., 2013a) have demonstrated that adults with ASD are having more success with dating than earlier studies (e.g., Howlin et al., 2004, Jennes-Coussens et al., 2006), though this may be a result of the samples in these studies having similar profiles (i.e., self-selected, high functioning adults with ASD who are interested in dating that completed online surveys). However, it is also plausible that adults with ASD are more successful in dating due to more awareness of this topic by professionals, and as such, more services are being provided. Despite the recent increase in success, the adults with ASD in the current study were using online dating for a substantial period of time (52 months), longer than the TDA group, but still had less overall success in dating, suggesting a continued need for formalized intervention in this area.

Sources of information. As expected, the ASD group had considerably fewer sources from which to learn about relationships. Specifically, the ASD group learned less from a number of sources, mostly social sources, than the TDA group. These included parents, social observation, peers and friends, siblings, and the media. As a whole, these results are consistent with the Stokes and colleagues (2007) study, which found differences between adults with ASD and TDA in learning from siblings, peers, social observation, and the media. In addition, another recent study demonstrated that adults with ASD had fewer social sources to learn about sexuality

related information (Brown-Lavoie et al., 2014), while the original online survey revealed that adults with ASD mostly learned about online dating through reading on their own (Roth & Gillis, 2014). Collectively, these studies have consistently demonstrated that adults with ASD have fewer sources to learn about sexuality related information, which has translated into less overall sexuality-related knowledge (Brown-Lavoie et al., 2014; Mehzabin & Stokes, 2011; Ousley & Mesibov, 1991). Relying on one's self or the Internet to learn about sexuality, specifically online dating can be problematic as the validity of these sources are unknown and may potentially be providing misleading or incorrect information. Instead, it would be beneficial for the ASD population to have an empirically developed learning source about dating, specific to the concerns to the ASD population. In addition, promoting social learning from peers may also aid in increasing dating knowledge in a way that is socially valid. Learning from peers appears to a typical occurrence in the TDA population and might be more relatable than advice from other sources, such as parents, who may have not used online dating in the past. For instance, peer advice could be relevant in the area of creating a profile, which according to the latest *Pew Research* poll on online dating, 22% of the participants used in the past (Smith & Duggan, 2013).

Online victimization. The two groups differed on a number of different types of online victimization, per visual analysis and effect size calculations. Specifically, the ASD sample experienced more harassment (i.e., insults), flaming (i.e., inappropriate answers left to posts), and exclusion (i.e., being left out of a group). Effect size calculation results yielded medium effects between the groups. However, gender may have been a potential confounding variable in that there were more males in the ASD group. Specifically, males may have been spending more time online, or visiting sites that may lead to more victimization, however, these variables were

not assessed in the current study. Recently, in a survey of young adults in the United Kingdom and China, males spent slightly more time on the Internet and used the Internet more for emailing/chatting and gaming (Li & Kirkup, 2007). These more interactive platforms may lead to an increase risk of exposure to victimization.

Although the current study did not examine sexual victimization, the higher rates of online victimization are consistent with the elevated rates of sexual victimization in the Brown-Lavoie and colleagues (2014) study, which demonstrated that adults with ASD were three times more likely to experience unwanted sexual contact, 2.7 times more likely to experience sexual coercion, and 2.4 more likely to experience rape. Taken together, these two studies suggest that core deficits of ASD lead to an increase in victimization. It should be noted that the *Stauder-Müller Scale* is a general online victimization scale and not specific to online dating. Thus, these results cannot be generalized to online dating victimization, which was reported at low rates in the current study, though the ASD group reported a slightly higher percentage of previous online dating victimization. Specifically, the ASD group had three instances being taken advantage of during online dating while the TDA group reported one instance (10% versus 2%).

Inappropriate courtship behaviors. As a whole, the ASD and TDA group initiated the same amount of courting behaviors. However, the total CBS score was limited in that not all the behaviors would be considered “inappropriate.” For instance, the TDA group had more instances of appropriate courting behaviors, such as telephoning others and initiating social contact. The authors of the scale may have intended for these to be inappropriate, however they did not provide a definition that would lead the reader interpret these behaviors as so. When each separate behavior was examined using visual analysis, it was more apparent that the ASD group had higher rates of inappropriate behaviors (showing obsessional interests, making inappropriate

gestures/comments, touching others, stealing/damaging property, making threats, and persistently pursuing someone that could be seen as threatening). In addition, they appeared more likely to use these courting behaviors on strangers (per visual analysis), which may lead to more involvement from the criminal justice system. However, no participant in the ASD group reported having contact with the criminal justice system due to courting behaviors. Moreover, it should be noted that the difference between the ASD and TDA group in the amount of courting behaviors directed toward strangers was small.

The two groups also did not differ in the amount of time pursuing others in the face of no response or a negative response from the other person, though this may be due to the self-report nature of the study (versus parent-report in Stokes et al. [2007]). Specifically, given the social awareness deficits characteristic of ASD, the participants in the ASD group may have not recognized the negative response from the other individual and as a result would be less likely to report these behaviors. The CBS could be improved upon in the future by better operationally defining these behaviors (e.g., telephoning them multiple times without an answer). Overall this study replicates previous studies that adults with ASD are more likely to engage inappropriate courtship behavior, though it was not online dating specific (Post et al., 2014; Stokes et al., 2007). Although these behaviors have not lead to an increase in involvement from the criminal justice system, it should not be assumed that this would be the case in the future. As such, it is important for proactive intervention in this area to teach appropriate ways to court another individual of interest.

Online dating knowledge. There are a number of studies that have shown that adults with ASD have less sexuality related knowledge than their peers (Brown-Lavoie et al., 2014; Mehzabin & Stokes, 2011); Ousley & Mesibov, 1991). In addition, it has already been

established in this paper that adults with ASD have less sources to learn about sexuality-based information. As such, it was not unexpected that the adults with ASD obtained, on average, a 50% accuracy score on the IDI, a scale that assessed online dating knowledge. However, it was unexpected that the TDA group performed equally poorly on the IDI, indicating that both the ASD and TDA group demonstrated inadequate knowledge regarding online dating. Nevertheless, these results should be interpreted with caution, given that the IDI demonstrated poor internal consistency, and thus may not be a reliable measure of knowledge. Although both groups performed poorly in the knowledge domain, it is still uncertain how significantly knowledge is associated with safety behavior. Some speculate that information is not a significant predictor for behavior change and is unnecessary in the IMB model, which was the model used in the current study to conceptualize online dating risk (Nostlinger et al., 2011; Sharma, 2012).

Motivation. Given that the ASD population has been found to have similar motivation to date comparable to the general population (Gilmour et al., 2012; Hellemans et al., 2007; Hénault & Attwood, 2002; Lunsky & Konstantareas, 1998), it was hypothesized that the two groups would have comparable motivation to remain safe during online dating. This hypothesis was confirmed using the total scores on the CYSOB, on which both groups (ASD, $M=91$; TDA, $M=95$) scored near the ceiling of the measure (115). Overall, these results indicate that motivation is not a concern for the population and could be utilized as a strength when teaching the population how to remain safe during online dating.

Behavior skills. Taken together, the current study and the original online dating survey, which revealed 81% of the sample having safety concerns, has demonstrated that the ASD population is aware of the importance of online dating safety (Roth & Gillis, 2014). However, as the IMB model (the model used in the current study to conceptualize online dating risk) states,

other variables (i.e., behavioral skills) are needed in conjunction with motivation to decrease risk (Barak et al., 2003; Roberston et al., 2012; Thomas, 2006; Sharma, 2012). Notably, in the original online survey study, while the sample was motivated to remain safe, some of their responses about their safety precautions suggested that they might not have the appropriate behavioral skills (“Meet the person as soon as possible and get to know their family and friends,” and “I generally just play everything by gut feeling”; Roth & Gillis, 2014).

As anticipated, the ASD group and TDA differed on the behavioral skills related to online dating safety in the current study. Similar to the performance on the IDI, the ASD group obtained, on average, 50% accuracy on this measure. When examining the specific skills on which the groups differed, and the questions in which the ASD group had difficulty (i.e., less than 50% accuracy), using visual analysis, the ASD group demonstrated deficits in skills related to recognizing when the person may be using deception, being assertive in situations where the other person is displaying “red flags,” and knowing when someone may be using a fake account. As a whole, these situations (recognizing potentially dangerous cues) are consistent with the regression analyses, suggesting that social awareness is a unique skill to target in adults with ASD.

Recognizing when someone may be using deception is an integral skill for not only online dating safety but also for online dating success and avoiding disappointment or embarrassment. Interestingly, in the original online dating survey study, the sample endorsed awareness that others may hide/alter their identity, which was the most noted concern about online dating (Roth & Gillis, 2014). In addition, the sample in the current study demonstrated awareness that others may be hiding their identity while online dating (e.g., 75% of the sample were aware of what the phenomenon “catfish” meant). However in the first assessment of

behavioral skills in this area, adults with ASD had difficulty recognizing this potentially dangerous situation, confirming a major criticism of the IMB model, in that information may not be a consistent predictor for safety.

This preliminary data indicates that there is a need to teach direct behavioral skills to recognize when someone may be using deception and how to verify someone's identity, also known as "warranting" (e.g., "Googling"). For instance, if someone claims to be a well-known doctor or an actor, the person can search for that information. Another example would be having the partner take a picture of themselves with the day's date written down or with day's newspaper (Gibbs et al., 2007). Although this is an important skill, it may be used less than expected in the general population, in which 29% of online daters endorsed using the Internet to look up information about a potential date (Smith & Duggan, 2013).

Teaching these skills may appear to be a straightforward process; however, it is important for adults with ASD to understand that there is grey area with online dating. In particular, it is normative behavior for individuals to engage in a "social balancing act" when making an online dating profile (i.e., exaggerating parts to stand out versus outright lying; Whitty, 2007) or use an online dating profile to show others the person that one wants to become in the future (i.e., the hyperpersonal model; Ellison et al., 2012). Given the rule governance of ASD, individuals may become disappointed or upset, and potentially stop communication with their partner, despite there being a high probability that the profile will not completely match up with the person they meet (Cheely et al., 2012). Therefore, teaching individuals the different degrees of misrepresentation and what is considered a "red flag," will be important to ensure that individuals with ASD can follow through with potential partners. The method of teaching different degrees of a behavior, which vary in riskiness, has been attempted previously in the

book, *A 5 is Against the Law* (Buron, 2006), which teaches adolescents and young adults with ASD and other social difficulties appropriate and inappropriate behaviors on a continuum. However, the teaching methods and information provided in the book has not been empirically evaluated.

It should be noted that there were some situations that the ASD group performed well on, and comparable with the TDA group. One of these situations was not following up on too many requests to communicate with no response, which is encouraging news given the concern with inappropriate courtship behavior and stalking (e.g., Stokes et al., 2007). This outcome is consistent with results obtained from the CBS in the current study, where the ASD group reported comparable rates of pursuing a partner in the face of no response. In addition, the ASD group performed well on situations that assessed their ability to recognize when someone may be attempting to lure them into a risky situation (e.g., meeting late-night at a bar for a first date; Couch & Liamputtong, 2007; Finkel et al., 2012). Finally, the ASD performed well on the situation on recognizing potential financial scams, which is promising given the cost associated with these scams (Finkel et al., 2012; Rege, 2009). It will be interesting to see if these results are replicated in future studies, thus providing a profile of specific skills to target in adults with ASD.

Objective Two

ASD severity and online victimization. It was hypothesized that the social communication deficits of ASD, specifically deficits in comprehending social cues, would lead to difficulty discriminating between safe versus unsafe situations, and as a result, higher scores on the *Staude-Müller Scale*. The regression analyses revealed that aspects of the social communication skill deficits of ASD, specifically social awareness, were most predictive of

online victimization. Social awareness, defined in the SRS-2 as the ability to pick up on social cues, appeared to be a unique predictor to the ASD group, as it was not found to be significant for the TDA group. When the number of dates was added to the Social Awareness score, it increased the explained variance, suggesting that dating experience may serve as a protective factor against online victimization settings (the number of dates was negatively correlated with victimization).

In addition, another aspect of social communication, social cognition, or the ability to interpret social cues once they are detected, was found contribute to online victimization, though not significantly. Logically, it is fitting that social cognition would not be as strong as a predictor as social awareness, given that the cues cannot be interpreted if they are not being initially detected. This is consistent using the *information processing theory* to explain risk reduction, in that a person cannot process or encode social information if it is not first sensed by the sensory register (Tuckman & Monetti, 2011). This would also fit a *behavior analytic* explanation to risk reduction, using stimulus control as the conceptual model. Specifically, individuals with ASD are responding to faulty stimulus control in that they have difficulty discriminating social cues that are reinforcing (discriminative stimuli) versus social stimuli that are not reinforcing (stimulus delta; Cooper, Heward, & Heron, 2007). As such, they respond inappropriately in potentially risky situations, as the cues in the situation have not become controlling stimuli.

As a whole, protecting individuals with ASD from victimization in online contexts, specifically harassment and flaming, are important given the negative outcomes associated with these events (Staude-Müller et al., 2012). For instance, individuals should understand that the anonymity of the Internet could lead to others engaging in potentially harmful behavior. In turn, individuals should be taught how to respond to potential red flags. Additionally, exclusion in

online settings, which was reported at a troubling rate in the current study, should be addressed given that some in the field believe that individuals with ASD use the Internet as an alternative way to cope with exclusion in face-to-face settings (Nichols et al., 2009). High rates of exclusion in online settings would also expect to have similar consequences to face-to-face exclusion (e.g., feelings of hopelessness, loneliness, and reduced life satisfaction; Mazurek, 2014), further highlighting the importance of increasing the probability of successful online interactions for the population.

ASD severity and inappropriate courting behaviors. When the social communication skill deficits and RRBs, as measured by the SRS-2, were entered into a regression model to determine if they were predictive of inappropriate courting behaviors, the model was found to be significant, though the social communication deficits were the significant predictor. This is somewhat contrary to the initial hypothesis, which speculated that the RRBs would be the most significant predictors. According to Stokes et al. (2007) the difficulty with social awareness and perspective taking, along with intense interests in others, could be contributing factors to inappropriate courting, however, the results indicate that the social awareness may be the more important variable to target. Interestingly, the ASD group performed adequately on the ROST scenario about following up too many times when a potential date does not respond, though replication is needed.

Future studies with a larger sample size should attempt to identify the aspects of social communication are the most predictive of inappropriate courtship behaviors as the individual scales of the SRS-2 Social Communication and Interaction domain (e.g., Social Awareness and Social Cognition) were not entered in this analysis. In addition there were some variables that could be use in future modeling studies that were not measured in the current study (e.g., sexual

frustration, emotional regulation, comorbid psychopathology) as well as potential protective factors against inappropriate courting, such as rule governance (Cheely et al., 2012; Murrie et al., 2002; Sevillever et al., 2013), which may improve the explained variance of the model.

Internal Consistency

Given that a number of scales used in the study were researcher developed (the IMB scales), the internal consistency of the scales were calculated to provide an initial measure of the measures' psychometrics properties. Overall, internal consistency analysis of the IMB scales yielded considerable variability. As a whole, the CYSOB demonstrated adequate internal consistency and had higher alpha scores than the scale it was modified from, the *Condom Attitude Scale* (Lawrence et al., 1994). In contrast, the scales developed by the examiner, the IDI and ROST had lower levels of internal consistency. In particular, the ROST demonstrated internal consistency that ranged from the acceptable to the unacceptable range, using the .60 cutoff in exploratory research (Quadrelli et al., 2009), while the IDI consistently yielded unacceptable internal consistency scores.

It was initially thought that the IDI and ROST alpha scores were affected by the multiple choice format of the scales, however, the scales were transformed into dichotomous data and analyzed using the appropriate procedures for multiple choice scales (Kastner & Stangla, 2011). It is more likely that the alpha scores were affected by two other factors. For one, the poor performance on the IDI (the groups performed around the 50% accuracy range) likely had an effect on the alpha scores. Although items were identified with high item difficulty, removal of these items did not affect alpha scores. Despite this, future research should consider revising or removing these more difficult items. In addition, future research could examine whether the reliability of the measures would improve after intervening on the IMB variables (i.e., post

treatment). Further, the low number of items on the scales (10 items on the ROST and 20 items on the IDI) likely had an impact on the alpha scores. Typically, lower alpha scores are suggestive that the scale had too few items (Tavakol & Dennick, 2011).

Furthermore, studies have demonstrated that Cronbach's alpha is affected by sample size. It is suggested that for every item on the scale, there should be 10 participants (Cortina, 1993; Rouquette & Falissard, 2011). Given this suggestion, there should have been a minimum of 100 participants recruited to examine the ROST, 200 participants to examine the IDI, and 230 participants to examine the CYSOB. However, given that the CYSOB, which included 23 items, demonstrated adequate internal consistency, it is clear that the ROST and IDI would benefit from redevelopment to improve these scales' internal consistency. In particular, these scales would benefit more from additional items and reduced item difficulty.

Limitations

The current study is not without limitations. For one, there were a number of differences between the two samples that could have introduced confounds. As a whole, the individuals with ASD can be described as a group that were interested enough in online dating to participate in this study. However, the TDA group was mostly made of students who were completing the study for course requirement or compensation. This was reflected on the DHS, where the ASD group reported more interested in online dating than the TDA group. The groups also differed on certain demographic variables, including age and gender, which were able to be controlled for in the analyses of variance but not for other analyses (i.e., chi-square and Mann-Whitney U). Moreover, there was not a large enough sample size to split the groups on gender. Future studies should consider separating the groups into genders if larger sample sizes can be obtained. Finally, the two groups differed on the number of non-ASD DSM diagnoses, which is expected

given the high rates of comorbidity in the ASD population (Matson & Goldin, 2013). However, this may be problematic as some of these diagnoses (e.g., depression and anxiety) could contribute to social functioning deficits, such as social awareness, and as a result confounded the differences between the groups.

Further, there are limitations regarding the generalizability of the study. For one, the number of participants that actually used online dating in the past was low (ASD, $n=14$; TDA, $n=7$), limiting the generalizability of the results to individuals using online dating. Additionally, given the number of outlets from which the survey was advertised, the number of survey completers for the ASD group should be considered small. Moreover, considering the requirement that participants were to complete the study independently, it was assumed that sample represents the high functioning population of adults with ASD. However, this cannot be confirmed since the cognitive abilities of the sample were not assessed. The survey also did not inquire whether the participants completed the survey with help and as a result, the validity of the self-report cannot be assessed. Given the online nature of the study, a number of other variables could not be controlled for, including participants looking up answers, the speed of presentation, and environmental distractions.

There were also limitations with the measures used in the current study, particularly with the IDI, which was found to have poor internal consistency. If additional work in the area of online dating and ASD were to continue, these scales would need to be redeveloped to improve their reliability. In addition, though the IDI, CYSOB, and ROST were analyzed for their internal consistency, other psychometrics properties were not assessed, including test-retest reliability and validity, thus it is unknown if the purported constructs were truly being measured. In addition to the IMB scales, the scale of online victimization, the *Staude-Müller Scale*, was

limited in that it measured general online victimization and it was not specific to online dating. As such, there was no true measure of online dating victimization in the study.

Finally, the sample size was slightly smaller than anticipated, mostly due to participants meeting exclusionary criteria. However, the stringent criteria for inclusion in the ASD group (meeting criteria on both the SRS-2 and AQ) could be considered a strength in the methodology of the study. Specifically, the use of two ASD screening measures improves upon limitations of previous survey studies with adults with ASD, which used one screening measure without verification (Brown-Lavoie et al., 2014, Mazurek, 2013). The small sample may have affected the power of some of the analyses, such as the analyses of variance and regression analyses. In addition, the MANCOVA analyses may have had reduced power due to the violation of normality of the ROST score for the TDA group that could not be corrected using transformation. The small sample size also limited the current study in the type of modeling that could be completed. A much larger sample size would have allowed for more complex modeling, which could have assessed a number of variables that may be relevant to predicting online dating risk and victimization, including reliance on others, social isolation, unquestioning compliance, and rule governance (Eldeson, 2010; Sevelever et al., 2013). Although the models identified were statistically significant, additional work in this area may increase the explained variance of these models.

Strengths

The current study also had a number of strengths. For one, this study was the first empirical examination of online dating skills in young adults with ASD. In addition, this study contributed to the limited literature on victimization for adults with ASD, inappropriate courting behaviors for adults with ASD, and how the core symptoms of ASD can contribute to a

victimization and inappropriate courting (see Brown-Lavoie et al., 2014). In particular, this study was able to replicate some of the previous findings by Stokes and colleagues (2007) on stalking using self-report (as opposed to parent report), in that adults with ASD reported higher rates of inappropriate stalking. However, findings regarding length of time pursuing others were not replicated. Furthermore, another strength of the study was assessing online dating skills directly using the ROST, which was comprised of analogue online dating situations. Methodologically, as stated earlier, the primary strength of the study was the stringent criteria for inclusion in the ASD group and exclusion in the TDA group (meeting criteria on both the SRS-2 and AQ). Specifically, out of the 21 adults who revealed the age at which they were diagnosed with ASD, 10 indicated they were diagnosed in adulthood (18 years or older). Given that the participants were recruited from community resources (e.g., Meetup.com), where diagnostics reports from clinicians were not available, coupled with the complexity noted earlier in diagnosing ASD in adulthood (Trammell et al., 2013), this stringent criteria provided confidence in the groups' compositions.

Future Directions

There are a number of future directions for research with online dating and ASD. For one, a number of problems with the methodology in the current study should be addressed. These include increasing the internal consistency of the IDI, and to a lesser extent, the ROST. This may include expanding the number of items on these scales or reducing item difficulty. In particular to the ROST, additional scenarios should be developed to yield two scales: a) potential victimization toward self; and b) inappropriate courting toward others. Currently, the ROST focuses more on situations when individual may be victimized, rather than unintentionally victimizing others. Additionally, the scales should be examined for other aspects of reliability

and validity. A scale specific to online dating victimization should also be developed in order to replace the more general *Staude-Müller Scale*, such as the scale used in the Brown-Lavoie and colleagues (2014) study. An online victimization specific scale will help analyze whether the IMB model, more specifically the ROST, CYSOB, and IDI can accurately predict whether an individual will engage in online dating safety behavior or if the model can predict victimization, as well as determine how significant information is in predicting online dating safety.

As a whole, the adults with ASD in this sample were motivated to date and used online dating for a considerable period time of time, however they had less success in dating and less sources to learn about relationships. In addition, they used more inappropriate courting methods and had more previous online victimization. The adults with ASD also had less developed behavioral skills in the area of online dating safety. Thus, taken together, another future direction for this research that is more applied in nature is the development of an intervention aimed at helping adults with ASD date more successfully and safely in online settings. Overall, there have been a number of books covering dating tips for adults with ASD (e.g., Carley, 2008; Lawson, 2005; Newport & Newport, 2002; Nichols et al., 2009; Ramey & Ramey, 2008; Zaks, 2006), however the strategies were not developed from previous research in this area and have not been empirically evaluated. Therefore, a standardized, empirically evaluated intervention seems to be appropriate for this population. Such an intervention should be developed using evidence-based methods of skill acquisition for the ASD population, such as applied behavior analysis (Gerhardt & Lainer, 2011; Rosenwasser & Axelrod, 2001; Roth & Gillis, 2014).

The ASD group had high motivation to engage in safety behaviors while online dating, which should be utilized as a strength in an intervention. Although it could be argued that, given the poor performance of the TDA group on the IDI, all individuals who online date would

benefit from such an intervention, the social communication skill deficits of ASD appear to present idiosyncratic barriers to remaining safe and dating successfully. Relatedly, there is some evidence suggesting that less impairment in the core deficits of ASD leads to more sexual satisfaction, thus highlighting the importance of intervening on the core deficits (Byers et al., 2013a). In particular, social awareness, or picking up on certain cues and risk factors, appears to be an important skill in which to target for adults with ASD. In contrast, none of the social communication skills, including social awareness, were found to predict online victimization for adults with TDA.

An effective approach to teaching social awareness may be discrimination training, a behavior analytic approach to skill acquisition. In particular, discrimination training would involve reinforcing individuals for identifying the situations that are appropriate (i.e., will be socially reinforcing), also known as discriminative stimuli, while withholding reinforcement for situations that are inappropriate or risky (i.e., will not be socially reinforcing or potentially aversive), also known as stimulus delta. For instance, it is a definite red flag when your potential partner consistently cancels the first face-to-face meeting. In addition, behavioral skills training (modeling, role playing and feedback) can be used to teach the steps of handling risky situations once the individuals have acquired the social awareness to detect the relevant cues (Cooper et al., 2007). Together, discrimination training and behavioral skills training could target the relevant IMB variables for online dating risk reduction. This type of intervention may be best delivered in an online format, so the individual can complete the training on their personal computer, to promote generalization of the skills in their natural environment. Topics that could be addressed, based on the current study and the Roth and Gillis (2014) online survey, could include: red flags when communicating with others; how to appropriately let another individual know you are

interested; places to ask another person for a date; reading information in others' profile and making a profile; deception; moving from computer communication to face-to-face meetings; how to deal with rejection and rejecting others; appropriate topics to discuss in initial online dating stages; and assertiveness skills.

Conclusion

To date, both studies on online dating and ASD have demonstrated that more adults with ASD are interested in online dating than are actually online dating. In the original online dating study, it was shown that safety concerns were the main reason individuals with ASD were not using online dating (Roth & Gillis, 2014), while the majority of the sample in the current study endorsed safety concerns toward online dating. It is imperative to provide the population with the skills to reduce their anxiety around online dating and allow them to enjoy the benefits, of which they are many (Finkel et al., 2012). There are number of negative effects from social isolation and loneliness for adults with ASD including low quality of life (Byers et al., 2013; Jennes-Coussens et al., 2006; Mazurek, 2014). Unfortunately, there are not many resources for adults with ASD in the area of romantic functioning, which is unfortunate given that the technology exists to promote effective behavior change (Roth, Gillis, & DiGennaro, 2014). Many individuals with ASD are now beginning to transition into adolescence and adulthood, and will become interested in dating. It will be important to the field to ensure that these individuals can do so safely and successfully. The current study has been an initial step to determine the areas of need empirically to help ASD lead safe and productive social and romantic lives.

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Appendices

Appendix A

Internet Dating Inventory (IDI)

Please answer the following questions below.

1. Which of the following is *not* true about following-up with your romantic interest often and/or quickly with emails, phone calls, or requests to meet in person?
 - a) You will appear desperate
 - b) You will come off as really committed to the relationship**
 - c) Your romantic interest may think you are a “stalker”
 - d) Your romantic interest may not know how to respond to you

2. Which of the following statements is true about intimacy and online dating?
 - a. Intimacy can be fully developed just chatting through the Internet
 - b. Intimacy can develop through the Internet, but the addition of video chat, or hearing the person’s voice is when intimacy truly develops
 - c. Intimacy cannot fully develop until a couple meets in person**
 - d. Intimacy can only develop after one year of dating

3. Which is an *inappropriate* topic of conversation to discuss through online chatting when first talking to your romantic interest?
 - a. Their job
 - b. Their religious beliefs**
 - c. Their hobbies
 - d. Their recent vacation

4. If driving to meet an online romantic interest for a first face-to-face meeting, which is *not* advisable when parking your car?
 - a. Park right next to the entrance**
 - b. Park in the middle of the lot
 - c. Taking a taxi
 - d. Park in an adjacent lot

5. What should be the primary purpose of meeting an online romantic interest face-to-face for the first time?
 - a. To see what they look like
 - b. To see if what they say in person matches their answers on the computer
 - c. To determine if this is a person to have a serious relationships with
 - d. To see if there should be a second meeting**

6. What best describes the phenomena, “Catfish?”
 - a. When someone is not that good looking in person
 - b. When someone’s personality is “biting” when you meet them in person
 - c. When someone’s identity is different when you meet them in person**
 - d. When someone is too eager to meet in person.

7. Which of the following is true about emailing an online romantic interest for an extended period?
- It shows the other person you are serious about protecting your identity
 - It shows the other person that you're going to wait until you're absolutely sure before meeting in person.
 - It may send the other person the message that you have something to hide, or a "shut in"**
 - It shows the other person that writing is your best form of communication
8. Which may be a problematic method (although also safe method) of protecting your identity when talking to a romantic interests online?
- Use an alias (fake name)**
 - Only use your first name
 - Make an alternate email account only for online dating
 - Make phone calls from a restricted number
9. Which of the following is a "dealbreaker" that should be discussed with your online romantic interest before meeting them face-to-face?
- One wants children and the other does not**
 - He/she does not share your passion for your primary hobby
 - Their profile picture is outdated and they look older in person
 - Having a previous marriage
10. What is the next step in successful online dating when you and your romantic interest have gotten to know each other through initial conversations on the Internet?
- Wait for them to make the first move and ask you to meet
 - Ask lots of personal questions to really get to know the person
 - Don't answer too many questions until you meet in person
 - Start revealing more about my thoughts and feelings**
11. Which of the following is the least effective way to verify the information of your online romantic interest?
- Googling information from their profile/picture
 - Looking up other profiles on different sites (e.g., Facebook, MySpace, LinkedIn)
 - Asking the person to repeat their information and check if it matches with their earlier statements**
 - Verifying their identity by looking at their employer's/company's website or calling the office to verify employment.
12. What is the recommended number of phone contacts to have with a your online romantic interest before meeting in person?
- One phone call
 - Two to three phone calls**

- c. Four to five phone calls
 - d. Six or more phone calls
13. Which of following *is not* one of the Wh's you should tell a friend or family member when meeting your online romantic interest for the first time?
- a. Who
 - b. When
 - c. Which**
 - d. Where
14. Which of the following would be the best place to meet someone your online romantic interest for the first time?
- a. Movies
 - b. Bar
 - c. Restaurant
 - d. Coffee shop**
15. Which of the following statements is true about moving from the computer communication to meeting your online romantic interest face-to-face?
- a. You shouldn't wait more than a week to meet in person
 - b. You shouldn't wait more than four weeks to meet in person**
 - c. You shouldn't wait more than six weeks to meet in person
 - d. You shouldn't wait more than eight weeks to meet in person
16. Which of the following is the biggest red flag that the person you are chatting with online may be involved with another person?
- a. They can only meet at odd hours during the day or night**
 - b. They give you only their cell phone number, not their home number
 - c. They say they have children
 - d. The pictures they sent are older
17. Which of the following is not good advice for the first phone call you have with your romantic interest you met online?
- a. Review the list of email/messages to find topics of conversation
 - b. Keep the conversation short
 - c. Write down the other person's responses
 - d. Ask to skip the phone call and go to meeting in person if you think you are not good at making phone calls.**
18. Which of the following is a valid excuse why someone cannot send you more pictures of themselves online?
- a. Their camera/equipment is broken
 - b. They are not good with computers and need someone to do it for them.
 - c. They are not comfortable sending additional photos
 - d. There really isn't a good reason why someone can't send additional photographs after a while.**

19. Which of the following is the most accurate statement about online dating profiles?
- a. Usually they are accurate
 - b. People are likely to misrepresent themselves a little**
 - c. People are likely to misrepresent themselves a lot
 - d. Most of the profile can be considered a misrepresentation
20. Which of the following is *not* a benefit of using a free online dating website versus a paid online dating website?
- a. Cost effective
 - b. More people using the site
 - c. No screening process**
 - d. Financial information is not stored

Appendix B

Confidence in Your Safe Online Behaviors (CYSOB)

Scales

Relationships Safety (RS)

Perceived Risk (PR)

Interpersonal Impact (IP)

Safety (S)

Effects on Sexual Experience (ESE)

Worry (W)

Note: (R) = Reverse Scoring

1	2	3	4	5
Strongly Disagree		Agree		Strongly Agree

1. Taking safety precautions takes the excitement out of online dating. (ESE) [R]
2. I am concerned about being taken advantage of online dating. (PR)
3. Taking safety precautions is not necessary when you and your romantic interest both are concerned about being taken advantage of. (RS) [R]
4. Taking safety precautions requires too much effort. (ESE) [R]
5. Taking safety precautions is not necessary if you have spoken on the phone with your romantic interest. (RS) [R]
6. Using safety precautions shows my romantic interest that I am serious about the relationship (PR)
7. Safety precautions are not necessary if you're pretty sure the other person isn't deceiving you. (RS) [R]
8. If I'm not careful, I could be taken advantage of. (PR)
9. I wouldn't pressure my romantic interest for more information if they refused. (RS) [R]
10. People who use safety precautions worry too much. (W) [R]
11. I wouldn't mind if my romantic interest brought up the idea of using safety precautions. (II)

12. **Taking the proper precautions creates a sense of security. (S)**
13. **People who use safety precautions must worry a lot. (W) [R]**
14. **If I'm not careful, I could be taken advantage of. (PR)**
15. **Taking precautions take the fun out of online dating. (ESE)
[R]**
16. **If my romantic interest suggested taking safety precautions, I would respect him or her. (II)**
17. **Other people should respect my desire to use safety precautions while online dating. (II)**
18. **I worry that I could be taken advantage of. (PR)**
19. **If my romantic interest suggested taking safety precautions, I would feel relieved. (II)**
20. **People who take safety precautions are just too worried, they will not be taken advantage of. (W) [R]**
21. **Safety precautions are not necessary when you've been chatting with the same person for a while. (RS) [R]**
22. **If my romantic interest suggested taking safety precautions, I would think that he/she was only being cautious. (S)**
23. **Safety precautions protect against being taken advantage of. (S)**

Appendix C

Response to Online Situations Task (ROST)

Situation 1: You have completed your second phone call with your online romantic partner and have just sent a new photograph of yourself. You send the following email two days later (play the movie below).

You: Hey, I miss you. I haven't heard from you since I sent my picture two days ago. I hope everything is okay. Can you please just send me an email so I know you are okay?

There is no response and you leave a voice mail two days later. Two days after the phone call you send a follow-up text message. After no response, you write the following message the next day:

You: Did I do something wrong? Why aren't you responding to me? Did you not like my picture? I really don't want to end like this. I need to talk to you; please I'm going crazy without you. Please just write me back.

Another two days goes by with no response. It has been 9 days since you last spoke on the phone with your online romantic partner. How would you respond next?

- a) Send one more email, scolding this person for being immature.
 - b) Call the police and file a missing persons report.
 - c) Try to look her work contact information on the Internet and contact them at work.
 - d) End your communication with the person because they are no longer interested and move on.**
-

Situation 2: You have been chatting with an online romantic interest in another state. The two of you have been chatting for almost 2 months and you decide that it is time to meet in person. You have the following conversation (play movie below).

You: "I'm so happy you are coming to visit. I can't wait to see you."

Them: "Me too, it is going to such be a great weekend. But there's a problem"

You: A problem?

Them: Yes, I looked up the plane ticket prices and they are really expensive. I can't afford this right now. I really want to be with you but I can't unless you help me out. Can I borrow \$400 for the tickets?

How do you respond next?

- a) I want to be with you too. I will help you out but you have to promise you will pay me back. How should I get you the money?
 - b) I want to be with you too but I am not comfortable sending that much money. We can still make this work, maybe I can come visit you? Or we can meet halfway?**
 - c) How dare you ask for money, I barely know you!
 - d) That is a lot of money, I'll send you half but you need to be able to pay for the other half, okay?
-

Situation 3: Your online romantic interest has 3 photographs on their profile and has sent you an additional photograph. However, the photographs seem kind of outdated. Specifically, their clothing and hairstyle seem to be from about 5 years ago. You have the following conversation (play movie below).

Them: Hey, did you get the new picture?

You: Yes, I just opened it. Thanks for sending it 😊

Them: Did you like it?

You: "I did! That's such a good picture."

Them: I hope that proves that is really me.

How would you respond next?

- a) Your hair and clothing look old. Do you have bad style or are you just sending me old pictures?
 - b) Yes, it does! Of course I trust that it's you.
 - c) I am a little concerned and I'd be more comfortable if you sent me a picture of you holding up a sign with today's date.**
 - d) I'll only know for sure when we meet in person.
-

Note: There is no movie to play for this situation

Situation 4: You have been chatting with someone online that seems pretty appealing. They say they are a medical doctor and also model part time. You have learned the name of the hospital for which they work.

How would you respond next?

- a) Look up more pictures on Facebook to see if they are really a model.
 - b) Quiz them on some things only a doctor would know
 - c) Go to the hospital and see if you can spot them walking out
 - d) Contact the hospital or visit the website to see if they work there**
-

Note: This situation only includes only a picture, there is no movie to play.

Situation 5: You receive the following message from someone you contact online. You find this person attractive and down to earth, based on what you read on their profile. This is the first message you receive (see the picture below).

Hey! Thanks for the email cutie ;) I'm so glad you contacted me. We have so much in common, it's scary how much we like the same things...and we live so close! I've been really lonely recently and would love to meet you tomorrow. Can you meet me at the pub on Main Street at 9pm?

How would you respond next?

- a) **I think we should spend more time talking online to make sure we click before meeting.**
 - b) I would love to meet you tomorrow, I think you're cute too ;)
 - c) It's a little creepy that you want to meet me tomorrow, no thank you.
 - d) (do not respond and ignore the message)
-

Situation 6: You have been chatting with someone online, and on the phone, for almost 4 months. Things are going great, and they do not live that far away from you. You really want to meet them in person, or at least video chat with them, but every time they agree to meet, they back out the last minute. You have the following conversation (play movie below).

You have the following conversation:

Them: Hey, are you there?

You: Yes, just getting ready to go out and meet you :)

Them: About that, something just came up. I don't think I can make it.

You: Really? This is the fifth time you have backed out the last minute.

Them: I know, but I'm not feeling well.

How would you respond next?

- a) It's okay. I understand. Feel better.
 - b) You are just making yourself sick from nerves. You should seek help.
 - c) **I'm really worried that you are avoiding me because you are hiding something. If you are unable to meet in person by next Friday, I'm afraid I'll have to move on.**
 - d) I'm really sorry you don't feel well, it's frustrating we can't meet. Let me come over and bring you some soup to feel better.
-

Situation 7: Someone you have been chatting with online for 2 weeks wants more information about. You have the following conversation (play movie below).

Them: I feel like I barely know you.

You: Well that's why we are chatting! What do you want to know?

Them: Well... your history. What is your full name? What are your parents' names? Where were you born?

Them: Oh, and random question. I've been looking for a new bank to use. What bank do you use?

How would you respond next?

a) Sorry, those are really personal questions. I can't answer those online but I'll be happy to discuss other things.

b) Sorry, those are really personal questions. I can't answer those online but how about we meet in person and I'll tell you my story :)

c) To be safe, why don't you give me your information first, then I'll give you mine.

d) You're really interested in me! To answer your question (proceed to answer the questions).

Situation 8: You and your online romantic interest are starting to talk about meeting in person for the first time. You have been talking for almost 1 month. You have the following conversation (play movie below).

You: Hey, I'm really excited to see you on Thursday.

Them: Me too! How about I pick you up at 7?

You: Oh, I am going to drive myself. I'll meet you there?

Them: Oh...

You: Is something wrong?

Them: Well you don't want me to pick you up. I feel like you don't trust me.

You: It's not that, I want to be safe. By the way, I told my friend our plans so they know where I'll be and with who.

Them: WHAT? I CAN'T BELIEVE YOU. YOU TOTALLY DON'T TRUST ME. I THOUGHT YOU WERE COMMITTED TO ME, I GUESS I WAS WRONG.

How would you respond next?

- a) I'm so sorry I upset you! You are right, I shouldn't have told them.
 - b) I do trust you. I am committed. Can we compromise on this instead of getting worked up?
 - c) It's not you. I have my own worries. It's not a big deal.
 - d) I am trying to make sure I am safe. For this to work, I need for you to respect my wishes.**
-

Note: There is no movie to play for this situation

Situation 9: You have been chatting with someone online who claims to be a wealthy business entrepreneur who was recently divorced. You decide to search for this person on Facebook. When you look at their Facebook page, you notice that they only have 10 Facebook friends with no photographs, posts, or additional information listed about them.

How would you respond next?

- a) Ask the person if they rarely use Facebook
 - b) Friend one of their friends and ask them about this person
 - c) Terminate the relationship, it's too odd**
 - d) Try and look up records about the divorce
-

Situation 10: You are really excited because you and your online romantic interest are finally ready to meet. You have chatted online, talked on the phone, video chatted, and now the next step is to meet the person! You are never sure about picking places to meet so you let your partner pick. You have the following conversation (play the movie below).

You: So we are really meeting this Friday!

Them: Yes, I'm so excited :)

You: Me too!

Them: I figured out our plan

You: Oh yeah?

Them: Yes. I think we should meet at the dive bar on 2nd street at 10pm on Friday night.

How do you respond next?

- a) I don't usually stay out that late but what the heck! I'll see you there!
- b) Oh, that actually gives me an idea. It might be too loud in there. How about we meet at the coffee house on 3rd street a little earlier, like 8pm?**

- c) I am concerned that you want to go drinking for our first date.
- d) Can we meet a little earlier?

Appendix D

Screen Shot of One Situation from the ROST

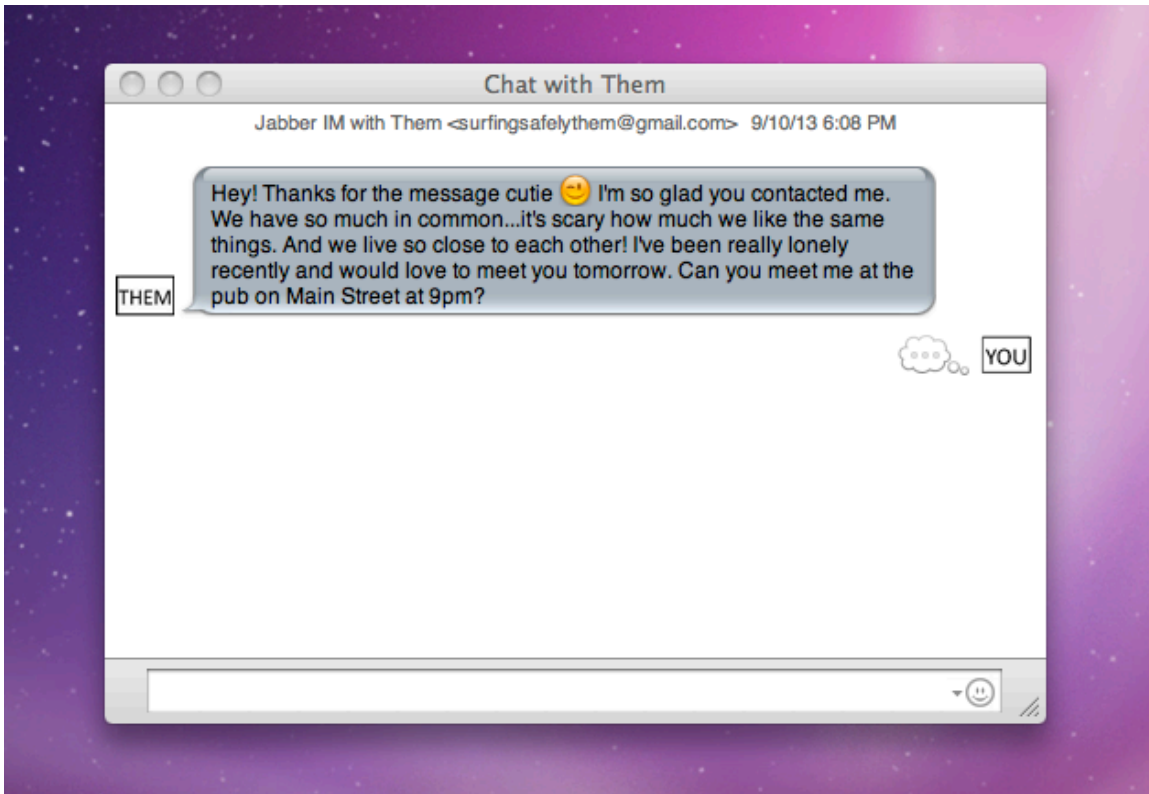


Table 1

Quantitative Demographic Information

Group	<i>n</i>	Age			AQ Total Score			SRS-2 Total T-Score		
		<i>Range</i>	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>M</i>	<i>SD</i>
TDA	56	19-30	21.18	3.02	9-37	16.85	5.51	40-69	50.52	6.93
ASD	30	19-29	23.92	3.24	26-44	33.50	5.17	61-88	73.50	7.86
Test for differences		<i>*t</i> (79)=3.73, <i>p</i> <.001, <i>d</i> =.87			<i>*t</i> (83)=13.59, <i>p</i> <.001, <i>d</i> =3.12			<i>*t</i> (84)=13.99, <i>p</i> <.001, <i>d</i> =3.10		

**p*<.001

Table 2

Qualitative Demographic Data

	TDA	ASD
Sex		
Male	9 (16.1%)	17 (56.7%)
Female	46 (82.1%)	10 (33.3%)
Transgender	1 (1.8%)	1 (3.3%)
Ethnicity		
Caucasian	39 (69.6%)	22 (73.3%)
Asian/Pacific Islander	11 (19.6%)	2 (6.7%)
Black, not of Hispanic Origin	2 (3.6%)	1 (3.3%)
Hispanic	1 (1.8%)	1 (3.3%)
American Indian or Alaskan Native	1 (1.8%)	-
Other	1 (1.8%)	1 (3.3%)
Non ASD Diagnosis		
Yes	12 (20.7%)	22 (73.3%)
No	44 (78.6%)	6 (20.0%)
Sexual Orientation		
Heterosexual	50 (89.3%)	22 (73.3%)
Gay/Lesbian	-	-
Bisexual	3 (5.4%)	3 (10.0%)
Asexual	-	1 (3.3%)
Pansexual	-	1 (3.3%)
Uncertain	1 (1.8%)	1 (3.3%)
Relationship Status		
Single	45 (80.4%)	23 (76.7%)
Dating	4 (7.1%)	3 (10.0%)
Married	4 (7.1%)	-
Civil Union/Domestic Partnership	2 (3.6%)	1 (3.3%)
Highest Education		
High School Diploma/GED	13 (23.2%)	5 (16.7%)
Some College	26 (46.4%)	12 (40.0%)
Associate's Degree	1 (1.8%)	-
Bachelor's Degree	5 (8.9%)	6 (20.0%)
Some Graduate School	4 (7.1%)	-
Master's Degree	7 (12.5%)	2 (6.7%)
Doctorate Degree	-	2 (6.7%)
Other	-	1 (3.3%)
Current Education		
Student	50 (89.3%)	13 (43.3%)
Non-Student	5 (8.9%)	15 (50.0%)
Living Situation		
Independent	8 (14.3%)	5 (16.7%)

Living with Family	8 (14.3%)	17 (56.7%)
College Housing	21 (37.5%)	2 (6.7%)
Living with Roommates	19 (33.9%)	1 (3.3%)
Supportive Housing	-	1 (3.3%)
Living with Partner	-	2 (6.7%)
<hr/>		
Employment		
Employed	22 (39.3%)	13 (43.3%)
Unemployed	34 (60.7%)	15 (50.0%)

Table 3

Chi-Square Analysis for Categorical Data

	TDA	ASD	Tests of differences
Sex			
Male	9 (16.1%)	17 (56.7%)	$\chi^2(2, N=84) = 18.31,$ $*p < .001$ ($\phi = .467$)
Female	46 (82.1%)	10 (33.3%)	
Transgender	1 (1.8%)	1 (3.3%)	
Ethnicity			
Caucasian	39 (69.6%)	22 (73.3%)	$\chi^2(1, N=82) = .303,$ $p = .581$ ($\phi = .114$)
Non-Caucasian	16 (28.6%)	5 (16.6%)	
Non ASD Diagnosis			
Yes	12 (20.7%)	22 (73.3%)	$*\chi^2(1, N=84) = 25.30,$ $p < .001$ ($\phi = .549$)
No	44 (78.6%)	6 (20.0%)	
Sexual Orientation			
Heterosexual	50 (89.3%)	22 (73.3%)	$\chi^2(3, N=82) = 4.423,$ $p = .219$ ($\phi = .232$)
Gay/Lesbian	-	-	
Bisexual	3 (5.4%)	3 (10.0%)	
Asexual	-	1 (3.3%)	
Pansexual	-	1 (3.3%)	
Uncertain	1 (1.8%)	1 (3.3%)	
Relationship Status			
Single	45 (80.4%)	23 (76.7%)	$\chi^2(1, N=83) = .001,$ $p = .971$ ($\phi = .004$)
Non-Single	10 (17.8%)	5 (16.6%)	
Highest Education			
Some College or Fewer	39 (69.6%)	17 (70.0%)	$\chi^2(1, N=83) = .370,$ $p = .543$ ($\phi = -.067$)
Bachelor's Degree or Higher	17 (30.4%)	10 (37.0%)	
Current Education			
Student	50 (89.3%)	13 (43.3%)	$*\chi^2(1, N=83) = 20.07,$ $p < .001$ ($\phi = -.492$)
Non-Student	5 (8.9%)	15 (50.0%)	
Living Situation			
Independent	8 (14.3%)	5 (16.7%)	$\chi^2(1, N=84) = .182,$ $p = .670$ ($\phi = .047$)
Non-Independent	48 (85.7%)	23 (76.7%)	
Employment			
Employed	22 (39.3%)	13 (43.3%)	$\chi^2(1, N=84) = .392,$ $p = .531$ ($\phi = .068$)
Unemployed	34 (60.7%)	15 (50.0%)	

* $p < .05$

Table 4

Cronbach's Alpha Calculations for the IMB Scales

Group	CYSOB	IDI	ROST
Online data (combined)	.88	.47	.54
TDA	.86	.47	.36
ASD	.91	.48	.62

Table 5

Sources of Social and Romantic Knowledge

Sources of Learning	ASD		TDA		Odds Ratio
	Frequency	%	Frequency	%	
Social Learning					
Parents	10	33.3	42	75.0	6.00*
Observation	20	66.7	49	87.5	3.50*
Peers and friends	16	53.3	52	92.9	11.38*
Siblings	5	16.7	25	44.6	4.03*
Media	16	53.3	38	67.9	1.85*
Internet	17	56.7	17	30.4	.33
Reading on own	12	40.0	17	30.4	.65
Romantic Learning					
Parents	4	13.3	27	48.2	6.05*
Observation	12	40.0	45	80.4	6.14*
Peers and friends	7	23.3	44	78.6	12.05*
Siblings	3	10.0	14	25.0	3.00*
Media	13	43.3	37	66.1	2.55*
Internet	12	40.0	16	28.6	.60
Reading on own	11	36.7	15	26.8	.63

*OR>1

Table 6

Summary of Backward Multiple Regression Analysis for SRS-2 Scales

Variable	<i>B</i>	<i>SE_B</i>	β	<i>p</i>
Model 1				
Intercept	-2.29	2.66		
Social Motivation	.05	.11	.09	.67
Social Awareness	.24	.22	.29	.29
Social Cognition	.01	.11	.14	.52
Social Communication	.02	.08	.08	.79
Model 2				
Intercept	-2.28	2.61		
Social Motivation	.06	.11	.10	.61
Social Awareness	.27	.18	.33	.14
Social Cognition	.07	.10	.16	.43
Model 3				
Intercept	-1.42	2.00		
Social Cognition	.07	.09	.14	.48
Social Awareness	.32	.15	.39	.05
Model 4				
Intercept	-.62	1.63		
Social Awareness	.36	.14	.44	.02*

Note. *B* = unstandardized regression coefficient. *SE_B* = Standard error of the coefficient. β = standardized coefficient.

**p* < .05

Table 7

Summary of Multiple Regression Analysis for the CBS

Variable	B	SE_B	β	p
Intercept	-25.69	13.26		
SRS-2 SCI	.52	.21	.58	.02*
SRS-2 RRB	-.40	.56	-.17	.48

Note. SRS-2 SCI = Social Communication and Interaction Index. SRS-2 RRB=Restricted Interests and Repetitive Behavior. B = unstandardized regression coefficient. SE_B = Standard error of the coefficient. β = standardized coefficient.

* $p < .05$

Figure 1

Assignment to Groups

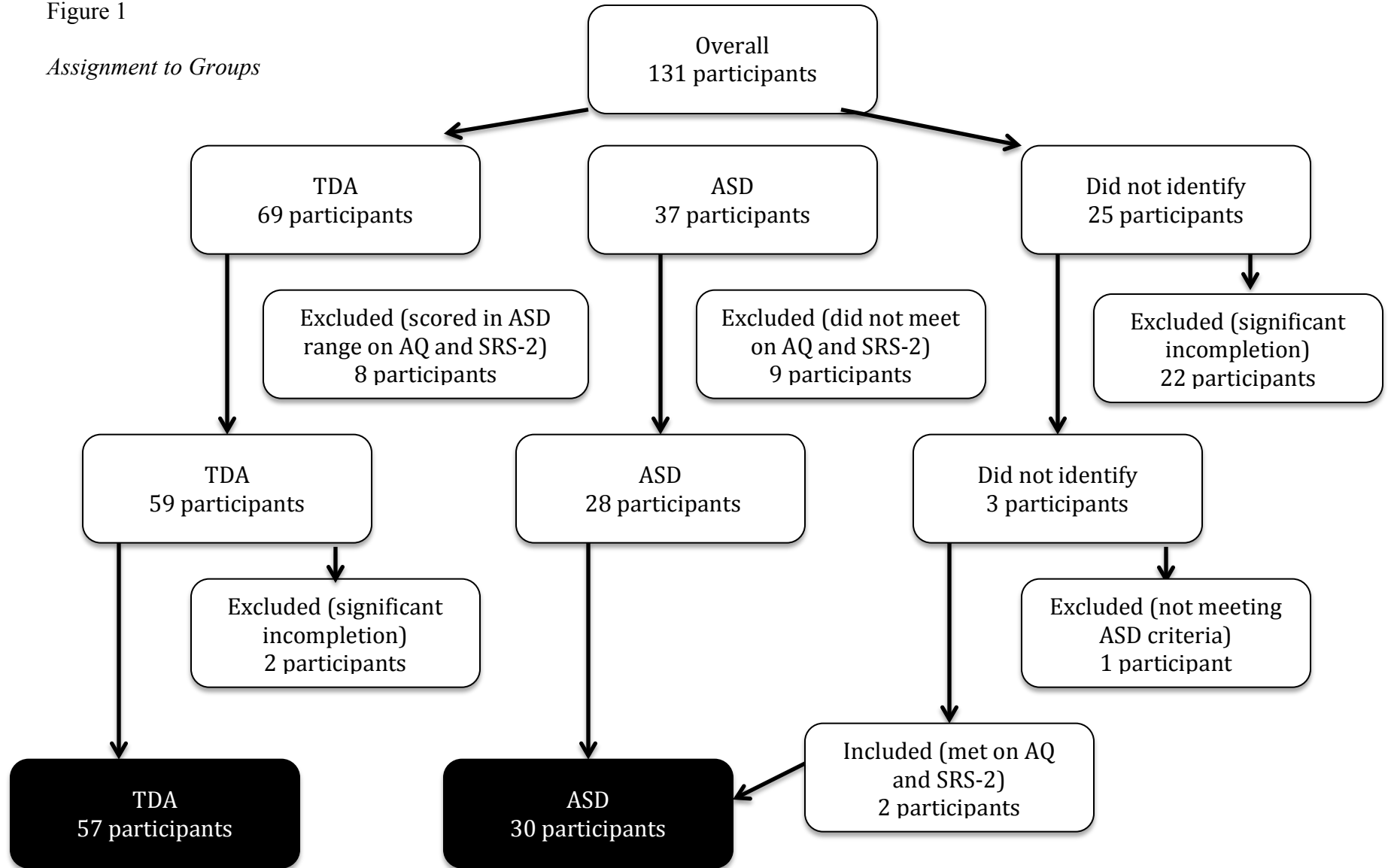
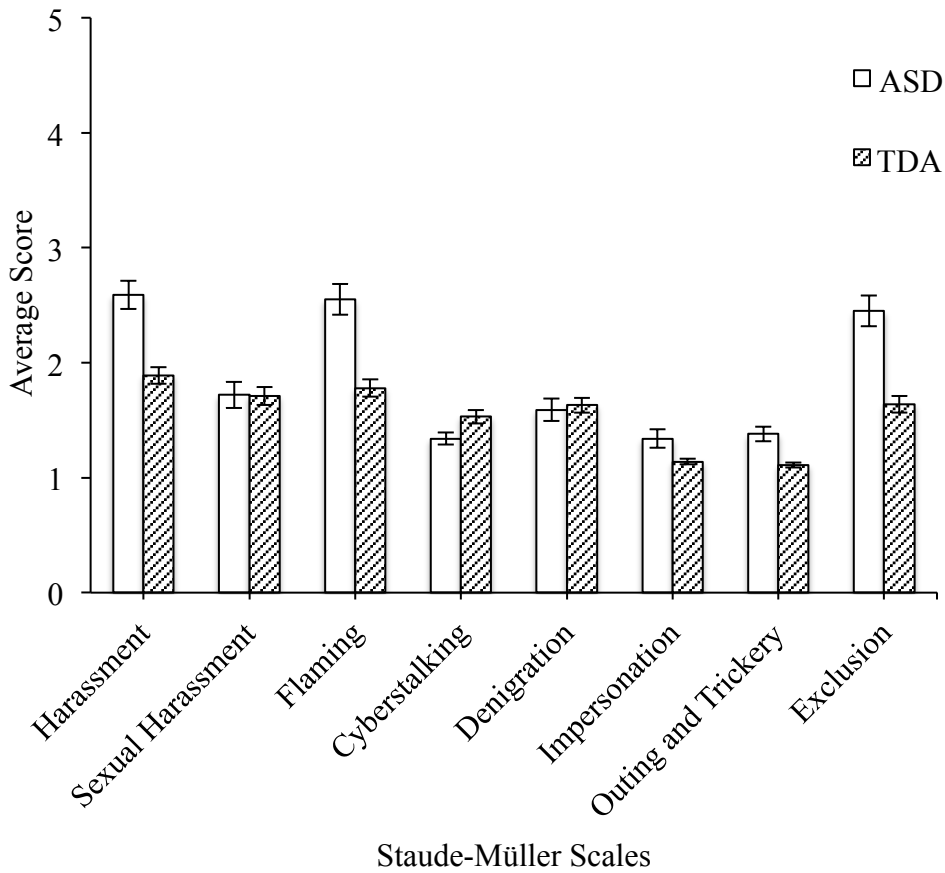


Figure 2

Average Scale Scores on the Staude-Müller Scale



Note. Likert Scales interpretation: 1=Never; 2=once or twice; 3=three to five times; 4=six to 10 times; 5=more than 10 times

Figure 3

Average Endorsement on the CBS Pursuing Scale

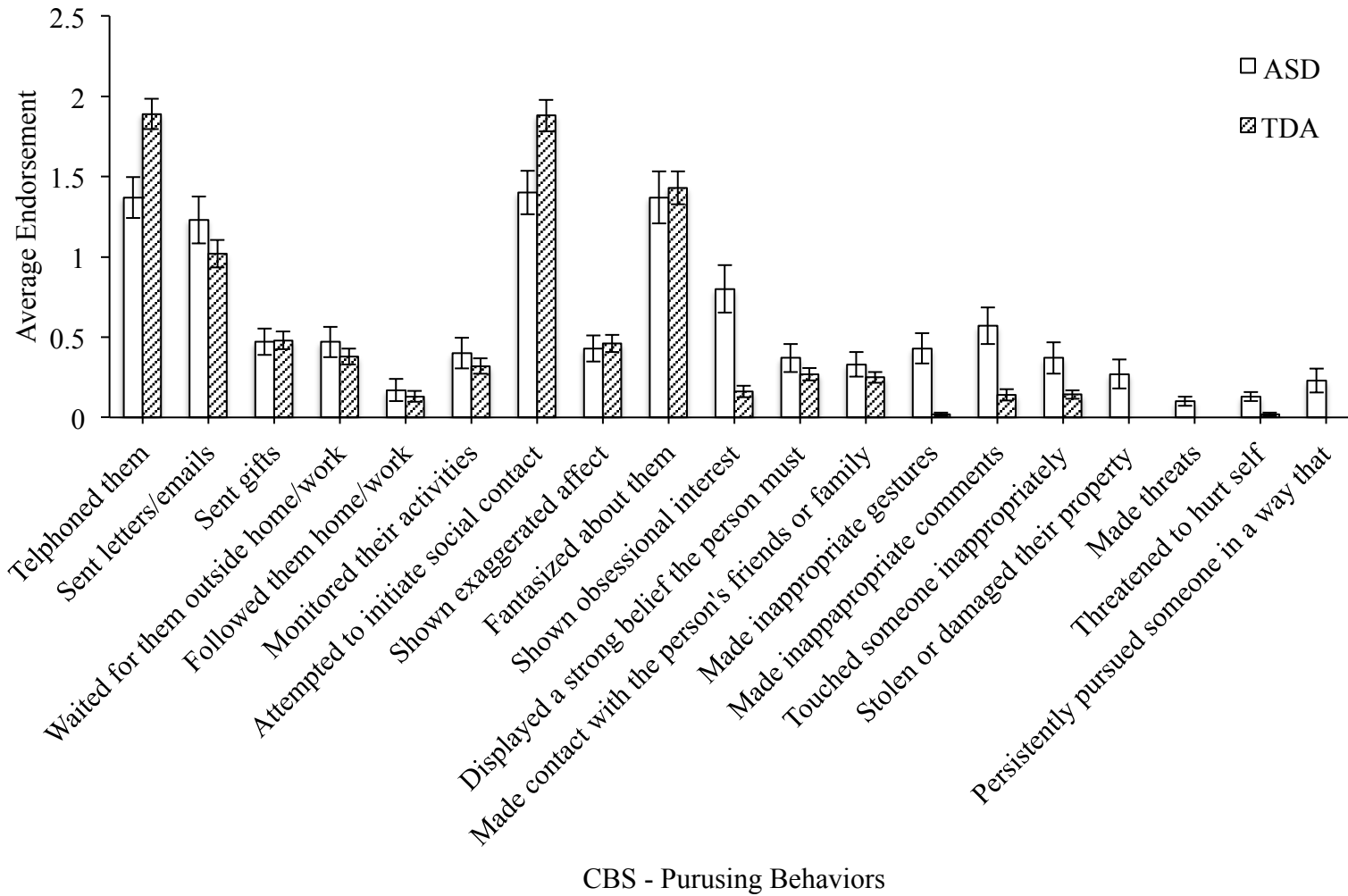


Figure 4

Targets of Courting Behavior on the CBS Pursuing Scale

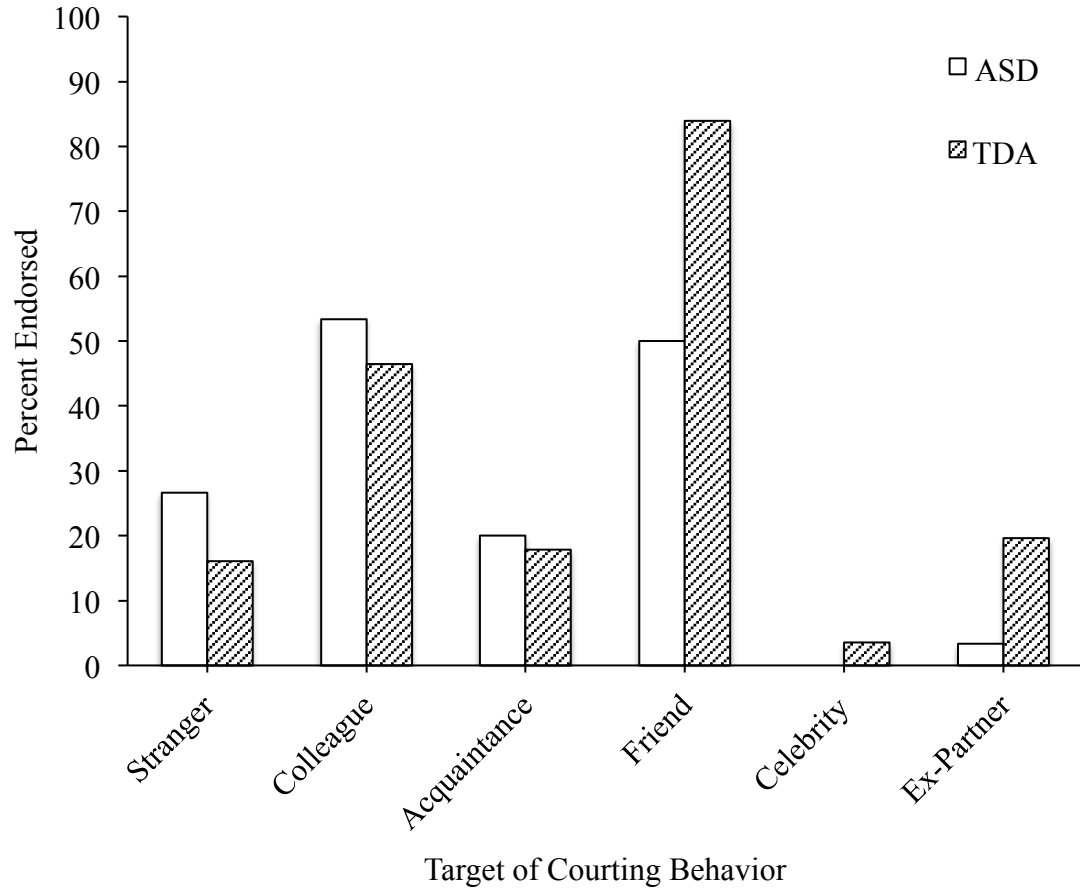


Figure 5

Percentage Correct on ROST Items

