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Abstract

The aim of this study was to test the effectiveness of an intervention that teaches turn-taking to college students with Asperger Syndrome (AS), an Autism Spectrum Disorder. Students with AS struggle to maintain socially acceptable conversations and require improved communication skills. The intervention given to the participants included a dyadic conversation with a person of the opposite sex. Utilizing the concept of a talking stick, experimenters promoted turn-taking and gave direct feedback to help improve the students' conversation skills. Ten male undergraduate students received the intervention along with surveys to evaluate their anxiety levels and turn-taking competence during social interactions. The results did not show a significant decrease in social anxiety; however, feedback from the participants and professors involved showed the importance of continued research to create interventions to reduce anxiety in college students with AS.

Keywords: autism spectrum disorder, turn-taking, social interaction anxiety, talking stick

Asperger Syndrome (AS) is an Autism Spectrum Disorder that involves difficulties with socialization and acquisition of age-appropriate language structures (Koegel, Ashbaugh, Koegel, Detar, & Regester, 2013). The American Psychiatric Association's 2013 Diagnostic and Statistical Manual of Mental Disorders (DSM-V), a guide for recognizing and diagnosing mental health disorders, has now eliminated the diagnosis of Asperger's and characterized it as an Autism Spectrum Disorder. For the sake of remaining consistent with the terms used in past research, this paper will refer to the same diagnosis as Asperger Syndrome and Autism Spectrum Disorder.

The number of people diagnosed with Autism has grown rapidly in the United States (Karayazi, Evans, & Filer, 2014). This is largely due to a better understanding and raised awareness of Autism Spectrum Disorders as opposed to a surge in its prevalence (Karayazi, Evans, & Filer, 2014). Defining AS can be controversial as there are no biological tests to assist in the diagnosis (Portway & Johnson, 2005). Those diagnosed tend to have uneven learning profiles, performing unusually well in some areas while being unable to improve in others. As stated by Asperger (1944), who classified the disorder, no two individuals with AS are alike.

Young people with AS are high functioning, showing less severe symptoms than most individuals with Autism, but still struggle to socially engage with their peers. It is important for them to receive support, as positive correlations have been found between social failure and depression in people with an Autism Spectrum Disorder (Koegel et al., 2013). They have trouble processing, producing, and understanding verbal and non-verbal communication (Hirvelä & Helkama, 2011). Someone with AS focuses on details and prefers rules and norms because they provide a sense of order. This leads to systemization and a higher capacity to analyze and construct systems that follow rules (Hirvelä & Helkama, 2011).

Symptoms of AS

Autism Spectrum Disorders present themselves differently depending on the individual. Typical symptoms include temper tantrums, depression, eating complications, abnormal sleep patterns, attention problems, self-injury, and a variety of anxieties (Hirvelä & Helkama, 2011). Individuals with an Autism Spectrum Disorder are also poor at expressing feelings to others. Individuals with AS are high functioning as they do not have an intellectual disability. However, empirical work has shown that they do have cognitive impairments leading to difficulties maintaining a social life and retaining a job (Hirvelä & Helkama, 2011).

One particular difficulty with Asperger Syndrome is that those diagnosed are not easily distinguishable, meaning it is unlikely they could be pinpointed as having a disorder. Their behaviors appear typical but their actions sometimes do not quite conform to social norms. Their behavior is considered somehow curious and they may be referred to as "marginally normal" (Portway & Johnson, 2005). They are often negatively impacted by others' perceptions and may be teased, mocked, manipulated, or left out. They feel extreme distress not following routine or when they encounter an unexpected occurrence. Long-term risks of AS may consist of underachievement, psychological and emotional problems, or prolonged dependency on one's parents (Portway & Johnson, 2005). Moreover, individuals with AS misinterpret implicit meanings and social rules and are abnormally sensitive to specific smells, sounds, and other's discomfort (Portway & Johnson, 2005).

Individuals diagnosed with AS may not only have difficulty communicating, but may express limited flexibility of thought. This could be due to an underdeveloped theory of mind, meaning an inability to grasp others' point of views. It is possible for these individuals to feel concerned, but they show impairments in cognitive recognition and emotion processing according to Hirvelä and Helkama (2011). These researchers found that those with AS scored lower on cognitive empathy subscales of perspective taking and fantasy. They also found that individuals with AS valued work-related values, security, and tradition higher than the average person.

Social Anxiety in Students with AS

While individuals with AS are cognitively and socially unique, they still partake in similar life experiences such as attending school. A majority of students with AS graduate high school without the preparation needed to have meaningful interactions and participate in the community (Carter, Harvey, Taylor, & Gatham, 2013). They often need additional help learning self-management, solving problems, and making independent decisions. Attending college can lead to a better future for students with AS, specifically in the areas of self-determination, employment, and independence (Carter et al., 2013). These improvements come from being surrounded by other young adults learning how to survive alone for the first time. College additionally gives students the opportunity to engage in contexts in which they can explore their strengths and curiosities. In this setting, young adults can find others who share their interests and develop friendships. Carter et al. (2013) found that a sense of belonging can make the difference "between being present in a community and having a presence in a community" (p. 893).

Many adults with AS are now attending college but are still struggling to engage in social participation and integration at the university level. It is during young adulthood that individuals with an Autism Spectrum Disorder become increasingly aware of social isolation (Carter et al., 2013). While living at home, individuals with AS relied on parents with whom they had formed trusted bonds (Bauminger, Solomon, & Rogers, 2010). Away from home, they become anxious when trying to connect to others and establish new trusted relationships. Due to their longing for social relationships and desire to contribute to the community, these students tend to feel lonely. This loneliness is especially apparent in college when individuals experience independence and many hours of daily free time. Although they want to initiate social interactions, individuals experience anxiety from the awareness of lacking social skills (Koegel et al., 2013). A cycle emerges in that having limited peer interactions leads to incomplete knowledge of appropriate social skills. Orsmond, Shattuck, Cooper, Sterzing, and Anderson (2013) found that less than half of adults with an Autism Spectrum Disorder participated in community events, such as recreational activities or special interest groups.

Lacking social relationships eventually can lead to nonacademic issues that decrease overall success in college (Carter et al., 2013). For this reason, it is important to find effective interventions targeting college age students with AS. This intervention should help develop appropriate social skills in adolescence or young adult-

hood to improve later social and academic life, which eventually would lead to a smooth transition into living independently (Karayazi, Evans, & Filer, 2014). Few replicated programs or interventions exist at the college level. Students with AS are often misunderstood by professors who are either unknowledgeable or unaware of the condition (Koegel et al., 2013). College students are expected to individually build friendships when arriving at school. However, a majority of young adults with AS prefer to engage in activities they enjoy alone in order to avoid the challenge of seeking out community, campus activities, or events.

Constant isolation further decreases the chances for forming peer relationships. Those with an Autism Spectrum Disorder have friendships that differ in quality and quantity compared to neurotypicals, those not on the Autism Spectrum (Bauminger, Solomon, & Rogers, 2010). Bauminger et al. (2008) consider peer friendships to be essential and constantly formed throughout one's life. Peer friendships provide an increased feeling of self-worth, emotional support, and protection against seclusion. For young adults with AS, forming these friendships is more complicated due to their lack of conforming, complimenting, and reciprocal behaviors. They must work harder to form mental representations of others and compensate for less affect-related resources.

Engaging in social interactions is even more complex for individuals with AS when a person of romantic interest is involved. Stokes, Newton, and Kaur (2007) found issues around socio-sexual development and functioning among those with AS. Individuals with an Autism Spectrum Disorder desire intimate relationships but are nervous and unsure of how to successfully initiate them. This can lead to naively engaging in inappropriate or intrusive behaviors (Stokes, Newton, & Kaur, 2007). In regard to gay men and lesbians with AS, it could be assumed they feel similar social anxieties; however, research thus far has failed to report on this specific topic. Although they struggle to initiate close relationships, individuals with AS typically have normal sexual desires and fantasies. They try and attempt to pursue relationships in ways that are similar to an average, neurotypical person. They are less informed about sexuality due to less social contact because of their lack of interpersonal skills (Stokes, Newton, & Kaur, 2007). Those with AS have difficulty distinguishing between inappropriate and acceptable courting behaviors. With plenty of social rejection and exclusion, a person with AS may be very persistent. This can lead to them being accused of stalking when they are really just seeking out a relationship (Stokes, Newton, & Kaur, 2007). Stokes, Newton, and Kaur (2007) reported that individuals with an Autism Spectrum Disorder did not learn romantic skills from family members, media, peers, or sex education. This deficiency of knowledge leads to socially unacceptable touching, obsessive interest, threatening behaviors, or inappropriate comments (Stokes, Newton, & Kaur, 2007).

AS and Lack of Conversation Skills

Along with portraying physically awkward behaviors, such as unnatural eye contact or clumsiness, individuals with AS tend to also struggle verbally in conversations. When speaking one-on-one, conversation may not flow and a person with AS will often state the obvious. These underdeveloped social skills make talking with a person of romantic interest especially difficult. Young people with AS are unable to understand the importance of flattery and showing affection toward a romantic partner (Aston, 2012). They may believe that actions such as completing daily chores show proof of their affection and therefore do not communicate their feelings. It is more difficult for them to reciprocate their partner's emotions unless the partner blatantly states how he or she feels. For these reasons, opposite sex interventions should be focused on behavior and follow a logical process. Important areas to cover include being sensitive to another's feelings, elements of timing, and being respectful when a partner's needs are different from their own (Aston, 2012). In many cases, individuals with AS misunderstand the intentions of those of the opposite sex and take their suggestions as personal criticism.

Intervention to Improve Turn-Taking

One intervention that can be used to improve social interactions for those with AS is practicing turn-taking. According to Hirvenkari et al. (2013), turn-taking creates natural conversation and regulates timing. Appropriately taking turns is a universal and fundamental aspect of conversation (Ter Maat, Truong, & Heylen, 2011). A turn can be exchanged in a matter of milliseconds and ideally without overlapping. Turn-taking behavior can serve as an indication of the speaker's views and social roles; such cooperative conversations have fewer interruptions than competitive conversations (Ter Maat et al., 2011).

A turn-taking intervention would define opportunities for turn transitioning and include the use of nonverbal cues. The linguistic, pragmatic, and prosodic (intonation) cues in speech signal when a person is finished talking (Hirvenkari et al., 2013). Using a combination of verbal and nonverbal cues can further emphasize when it is time for a turn transition. Overlapping is generally perceived as undesirable; however, it is not always wrong, as interruptions in speech are quite common. Another aspect of turn-taking is gaze. The direction of the speaker's gaze can signal the end of his or her turn. For example, an individual uses less eye contact when still continuing his or her turn (Hirvenkari et al., 2013). Two types of turn management strategies include startup and overlap resolution strategies (Ter Maat et al., 2011). Startup strategies teach appropriate timing for starting one's turn. Overlap resolution teaches how to react to an overlap, whether to stop speaking or to raise one's voice. These are only a few examples of the limited number of turn-taking interventions available to individuals struggling with socialization. Consequently, the purpose of this study was to test the effectiveness of a turn-taking intervention for college students with AS.

Based on previous research, three hypotheses were developed. The first hypothesis stated that participants would score lower on a self-designed Opposite Sex Communication Anxiety Scale, compared to their baseline measures, after the intervention. The second hypothesis stated that participants would score lower on the Social Interaction Anxiety Scale, compared to their baseline measures, after the intervention. The idea was that the intervention would give participants practice interacting with a person of the opposite sex and practice one-on-one conversation skills, thereby decreasing their anxiety levels. The third hypothesis stated that participants would rate their turn-taking competence higher after receiving the intervention.

Method

Participants

Ten participants between the ages of 18 and 23 years (M = 20.6) were recruited from a small, liberal arts college. All participants were White men with a heterosexual sexual orientation, diagnosed with Asperger's Syndrome and currently enrolled in the college's interpersonal communications class. The class was open to both male and female students medically diagnosed with an Autism Spectrum Disorder; however, no women were currently enrolled. Participants did not receive monetary compensation for their participation.

The experimenters, four women completing bachelor's degrees in psychology, worked with the counselors and professors teaching the class to request full class voluntary participation. Using a random number generator, participants were randomly divided into two groups of five. For the first experiment, Group 1 served as the experimental group and received the intervention while Group 2 served as the control group. During the second experiment, Group 2 received the intervention while Group 1 served as the control group. Both experiments were reviewed and approved by Westminster College's institutional review board.

Materials

Three self-assessment surveys were administered during the experiment following a brief demographics questionnaire. No participants reported a same-sex sexual orientation. The Opposite Sex Communication Anxiety Scale (Appendix A), $\alpha = .908$, which was a modified version of Glickman and Greca's (2004) Dating Anxiety Scale for Adolescents, assessed the levels of stress felt due to social situations involving a person of the opposite sex. This scale consisted of 14 questions with a rating scale from one to five and assumed participants were heterosexual. Samples of questions include "I often feel nervous when talking to an attractive member of the opposite sex" and "Parties often make me anxious and uncomfortable."

The second scale was Mattick and Clarke's (1998) Social Interaction Anxiety Scale (Appendix B), $\alpha = .854$, and had 20 questions measuring stress relating to day-to-day social interactions by using a rating scale. An example of one of these questions is, "I have difficulty making eye contact with others."

The final measure tested turn-taking competence. The scale was a single question written by the experimenters. It asked participants to rate their self-perceived competence on a scale from one to five in regards to the following statement: "I am able to appropriately take turns in a conversation." A rating of one meant not at all feeling comfortable taking turns while five meant participants felt confident in their ability to take turns during a conversation.

An additional aspect of the experiment was cue cards. These were used during the intervention if participants were unable to begin or continue a conversation.

The topics were chosen ahead of time by the participants and included pets, past choices, hometowns, college majors, music, movies, and historical figures.

Design

The experiment used a repeated measures design. The study took place in two parts with two groups of participants. Before beginning, all participants received the Opposite Sex Communication Anxiety Scale, Social Interaction Anxiety Scale, and Turn-Taking Question. During part one, Group 1 received the turn-taking intervention while Group 2 served as the control group and received no intervention. The dependent variable was each participant's scores on the anxiety scales and turn-taking question following the intervention, or lack of, compared to their baseline scores. During part two, Group 2 received the independent variable with Group 1 serving as the control group. The dependent variable of self-rated anxiety was then measured a third time by the three scales.

Procedure

All participants, Groups 1 and 2, began by completing the Opposite Sex Communication Anxiety Scale, Social Interaction Anxiety Scale, and turn-taking question. Group 1 served as the experimental group and was given the turn-taking intervention. Group 2 served as the control group and did not receive an intervention. Experimenters then administered the anxiety scales and turn-taking question a second time to all participants. The group roles were then reversed. Group 2 received the intervention while group one served as the control group. Lastly, both groups took the anxiety scales and turn-taking question for a third time.

The intervention consisted of the four women running the experiment, all of whom had researched AS but received no training, holding approximately five-minute one-on-one conversations with each participant in the experimental group. The intervention was held in the same classroom where participants attended their weekly interpersonal communications class. A plastic water bottle was used as a form of talking stick. Each experimenter had her own bottle, which she passed back and forth to enforce turn-taking and encourage an equal amount of talking during the conversation. If a participant stopped communicating or did not know what to say, each experimenter had cue cards available for participants to look through and talk about. Topics on these cue cards were based on interests previously expressed by the participants. The topics included: pets at home, the hardest decision one has ever made, hometown, college major, favorite songs, bad movies, and favorite historical figures. The experimenters began each conversation by asking how the participant's day was going. A phone timer with a quiet alarm was used to time the conversations and signal the end of five minutes.

Results

We compared the participants' self-reported scores on the three questionnaires before receiving the turn-taking intervention to their self-reported scores after each intervention. A one-way repeated measures ANOVA was conducted to examine change in scores on the Opposite Sex Communication Anxiety Scale which showed $F(1,8) = 2.58$, $p = .63$, $\eta_p^2 = .03$. Results indicated that no significant difference was found between the Opposite Sex baseline scores (M=1.67; SD=1.08) and post intervention scores (M=1.90; SD=1.18). This did not support the first hypothesis. A one-way repeated measures ANOVA was run of time on the Social Interaction Anxiety Scale, which showed $F(1,8) = .73$, $p = .42$, $\eta_p^2 = .08$, not supporting the second hypothesis. Results showed no significant difference between the social anxiety baseline scores (M=1.76; SD=0.94) and post intervention scores (M=2.04; SD=0.87). Finally, a one-way repeated measures ANOVA was run of time on the turn-taking question, which showed $F(1,8) = .50$, $p = .50$, $\eta_p^2 = .06$ (see Figure 1). Results did not support the third hypothesis, with no significant difference found between the turn-taking baseline scores (M=1.60; SD=1.35) and post intervention scores (M=1.78; SD=1.39).

Discussion

The aim of our study was to improve self-perceived turn-taking skills and decrease social anxiety in college students with Asperger's Syndrome. Our first hypothesis predicting that participants would score lower on our Opposite Sex Communication Anxiety Scale after the intervention was not supported. The second hypothesis, which stated that participants would score lower on the Social Interaction Anxiety Scale after the intervention,

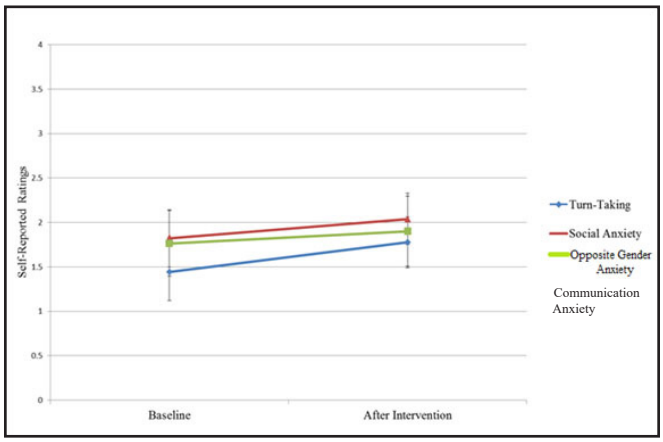

Figure 1. Mean scores on two anxiety scales and turn-taking question before and after the intervention.

was also rejected. The third hypothesis, which stated that participants would report an improvement in their perceived turn-taking competence, was rejected as well. None of the results were statistically significant and the statistical power was low due to such a limited sample.

The results showed no increase in participants' turn-taking competence or overall decrease in social anxiety in either group. Although the results were not significant, the counselors teaching the participants' interpersonal communications class reported a slight overall improvement in conversational confidence. They reported this improvement after interacting with the participants in the weeks following the intervention; however, these were merely personal opinions without support from the data. It is possible that the students' conversation skills were further developed, but they were unable to see this change in themselves. This could imply that it is easier to make individuals more competent at a skill or task than to change their self-perceptions or increase their self-confidence. Individuals with AS are shown to inherently lack self-esteem and perceive a difference between themselves and others (Portway & Johnson, 2005).

When asked for feedback, a few participants said they felt more comfortable taking turns following the conversations with the experimenters, even though they did not reflect this opinion in the survey. This is consistent with the research done by Hirvenkari et al. (2013), which found that practicing turn-taking can improve social interactions in people with AS. However, these researchers only observed the physical aspects of turn-taking. Participants' feelings of competence were neither measured nor recorded.

Limitations

Our study had a variety of limitations. The sample size was small with only 10 participants. While this allowed the researchers to spend one-on-one time with each participant, it was not representative of the population at large. Anyone can be born with AS, regardless of sex or race. Our participants were limited to only White men between the ages of 18-22 attending a small liberal arts college. A second limitation was the individual differences in participants that were not accounted for by the experimenters. It is probable that the number of interactions each participant had with female students on a daily basis varied widely. For example, some participants were currently living in fraternity houses where they were more likely to be exposed to opposite sex interactions. This may have affected the ratings on the Opposite Sex Communication Anxiety Scale, which looked at social anxiety around a person of the opposite sex. Additionally, the results may have been skewed due to carryover effects.

The biggest limitation of our study was the lack of time to complete the experiment. Each group of participants only received the intervention twice before filling out the questionnaires for a second time. This gave them one week to improve their turn-taking skills and grow more confident in their social abilities. It was somewhat unfair to expect them to feel more competent after such little help and limited practice. Aston (2001) stressed the importance of both the individuals with AS and their friends or partners working through problems in social situations over time.

Future Directions

Future research should examine the effects of a turn-taking intervention that lasts longer than one week. This would allow more time for students to improve their turn-taking skills and more conversation practice to lower their social anxiety. It would also give students additional experience around people of the opposite sex, allowing them to better familiarize themselves. In addition to feeling comfortable engaging in conversation with the opposite gender, a person with AS would benefit from controlled conversations with a diverse variety of individuals. This could include ethnically diverse individuals or those raised in different parts of the world with unique cultural upbringings.

Another suggestion for future research would be to have experts, such as those teaching the interpersonal communications class, rate students on turn-taking competence instead of having participants self-report their competence. Students with AS would greatly benefit from research going beyond communication and increasing self-confidence in social situations. Developing a standardized performance task that could be evaluated objectively might also be a more accurate way to measure students' progress.

Future researchers could also expand on the skills taught to students with AS. The participants listed of a variety of skills they wished to improve upon before the experiment. Some of these skills included methods for joining a conversation, initiating conversations, approaching a group of people, talking to more than one person, and properly contributing to a conversation. Participants showed optimistic attitudes about moving beyond turn-taking with the desire to finally fit in with their classmates. However, their poor self-ratings on the anxiety scales show a lack of self-efficacy and a need for continued support.

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Appendix A

Opposite Sex Communication Anxiety Scale

1 = Not at all characteristic of me
2 = Slightly characteristic of me
3 = Moderately characteristic of me
4 = Very characteristic of me
5 = Extremely characteristic of me

1. It takes me a long time to feel comfortable when I am in a group of both males and females. 1 2 3 4 5
2. It is difficult for me to relax when I am with a member of the opposite sex who I do not know very well. 1 2 3 4 5
3. I think I am too concerned with what members of the opposite sex think of me. 1 2 3 4 5
4. I often feel nervous when talking to an attractive member of the opposite sex. 1 2 3 4 5
5. I tend to be quieter than usual when I'm with a group of both males and females. 1 2 3 4 5
6. I often feel nervous or tense in casual get-togethers in which both guys and girls are present. 1 2 3 4 5
7. Parties often make me anxious and uncomfortable. 1 2 3 4 5
8. I often worry about what kind of impression I am making on members of the opposite sex. 1 2 3 4 5
9. I am more shy with someone of the opposite sex. 1 2 3 4 5
10. I tend to tense up when it is my turn to talk. 1 2 3 4 5
11. I tend to hyper focus on me when I engage in conversation. 1 2 3 4 5
12. I tend to disengage from conversation abruptly when the topic does not interest me anymore. 1 2 3 4 5
13. I often feel anxious when I cannot tell when to enter a conversation. 1 2 3 4 5
14. I often feel happy when I'm with my friends. 1 2 3 4 5

Appendix B

Social Interaction Anxiety Scale

Instructions: For each item, please circle the number to indicate the degree to which you feel the statement is characteristic or true for you. The rating scale is as follows:
0 = Not at all characteristic or true of me.
1 = Slightly characteristic or true of me.
2 = Moderately characteristic or true of me.
3 = Very characteristic or true of me.
4 = Extremely characteristic or true of me.

1. I get nervous if I have to speak with someone in authority (teacher, boss, etc.). 0 1 2 3 4

2. I have difficulty making eye contact with others. 0 1 2 3 4

3. I become tense if I have to talk about myself or my feelings. 0 1 2 3 4

4. I find it difficult to mix comfortably with the people I work with. 0 1 2 3 4

5. I find it easy to make friends my own age. 0 1 2 3 4

6. I tense up if I meet an acquaintance in the street. 0 1 2 3 4

7. When mixing socially, I am uncomfortable. 0 1 2 3 4

8. I feel tense if I am alone with just one other person. 0 1 2 3 4

9. I am at ease meeting people at parties, etc. 0 1 2 3 4

10. I have difficulty talking with other people. 0 1 2 3 4

11. I find it easy to think of things to talk about. 0 1 2 3 4

12. I worry about expressing myself in case I appear awkward. 0 1 2 3 4

13. I find it difficult to disagree with another's point of view. 0 1 2 3 4

14. I have difficulty talking to attractive persons of the opposite sex. 0 1 2 3 4

15. I find myself worrying that I won't know what to say in social situations. 0 1 2 3 4

16. I am nervous mixing with people I don't know well. 0 1 2 3 4

17. I feel I'll say something embarrassing when talking. 0 1 2 3 4

18. When mixing in a group, I find myself worrying I will be ignored. 0 1 2 3 4

19. I am tense mixing in a group. 0 1 2 3 4

20. I am unsure whether to greet someone I know only slightly. 0 1 2 3 4