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**Perceptions of Guilt of Individuals with a Visible Communication Disorder versus an
Invisible Communication Disorder**

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Honors Thesis

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Abstract

This study explored how communication disorders may impact listeners' perception of guilt. More specifically, it looked at how visible communication disorders (e.g., stuttering) and invisible communication disorders (e.g., high functioning autism) are judged by the general public. 51 adults (18-71 years) participated in the study which asked them to view video recordings of narrative samples produced by an individual who stuttered (PWS), an individual with high-functioning autism (PHFA), and an individual with no communication disorder (PNCD). Participants were not informed of the individuals' communication abilities (PWS, PHFA, or PNCD), but were told that one of the individuals had committed a crime prior to hearing the narratives. After viewing the narratives, participants filled out a questionnaire where they were asked to identify which individual committed the crime, as well as questions regarding trust, friendship and story accuracy. Results revealed that the PWS was selected least frequently as guilty, selected equal to the PHFA in desire to have as a friend, and selected the least frequently for being trusted the least. There were no differences between speakers on measures of story accuracy. The results of the study demonstrated elevated levels of leniency towards the PWS. This suggests that those with visible communication disorders are generally perceived as deserving of sympathy due to their impairment, while those with invisible communication disorders are perceived as no different from those without a communication disorder. This is important knowledge for how those with communication disorders are treated in the criminal justice system and extends to how those with communication disorders are treated in daily life.

Introduction

In 2002, there were over 6,000,000 children aged 3 through 21 receiving services under the Individuals with Disabilities Act (IDEA). Of these children, over 21% were receiving services for speech and language disorders, otherwise known as communication disorders (Thatcher, Fletcher, & Decker, 2008). The Centers for Disease Control and Prevention (CDC) additionally reported that nearly 8% of children between the ages of 3 and 17 had a communication disorder within the past year. A communication disorder may present itself in the form of a deficit in speech, language, and/or hearing, and can affect people of all ages. It is defined as an impairment in the ability to receive, send, process, and comprehend concepts through verbal, nonverbal, and graphic symbol systems. Communication disorders may be the result of a primary disability or secondary to other disabilities and can range in severity.

The terms “speech” and “language” are often used interchangeably, but it is important to understand the differences. Speech is the physical formation of sounds and words including articulation, voice, and fluency. A speech disorder typically includes a challenge with one or a combination of those areas. Language, on the other hand, is about the words an individual uses and how they use words to share and express ideas. An individual with a language disorder may have difficulty sharing thoughts, ideas, and feelings (aka., expressive language disorder), and/or comprehending what others say (aka., receptive language disorder). It may involve the form of language (phonology, morphology, & syntax), the content of language (semantics), and/or the function of language in communication (pragmatics) (ASHA, 1993). An individual may have a combination of communication disorders.

One type of speech disorder known as stuttering has been shown to affect approximately 3 million Americans (National Institute of Health, 2016). As reported by the National Institute of

Health, its exact causes are unknown and is most common among children ages 2-6 years old. It is known that 5-10% of all children will stutter for some time in their life, lasting anywhere between a few weeks to many years. Boys are more likely to stutter than girls and as people get older, the gender difference increases; the number of boys who continue to stutter is three to four times more than the number of girls. About 75% of children recover from stuttering, while the other 25% who continue to stutter may maintain the stutter as a chronic communication disorder through the rest of their lives. Stuttering is characterized by the repetition of sounds, syllables, or words, prolongation of sounds, and interruptions in speech called blocks. Someone who stutters knows what they want to say but has trouble producing a regular flow of speech. A person who stutters may also exhibit secondary behaviors such as rapid eye blinking or lip tremors.

Stuttering may make it difficult to communicate with others which can impact an individual's quality of life. It can also hinder job performance and opportunities, and treatment can be costly. Because it is difficult to hide or suppress stuttering, most people are familiar with the typical characteristics of stuttering, thus stuttering may be considered a visible communication disorder. A stuturer's symptoms may vary throughout their day. Speaking in front of a group of people they are not comfortable with may make symptoms worse, while singing, reading, or speaking in unison may temporarily reduce symptoms. The two major groups of stuttering are developmental stuttering, which occurs in children who are still learning speech and language skills, and neurogenic stuttering, which may develop after a stroke, head trauma, or other brain injuries (National Institute of Health, 2016).

Several research studies conducted in America have revealed that people who stutter (PWS) experience negative public attitudes and responses (Boyle, 2017; Craig, Tran, & Craig, 2003; Hughes, Gabel, & Palastik, 2017). In these studies, PWS have been described as having

undesirable personality characteristics, such as being timid, anxious, nonassertive, and shy, are reacted to with physiological and emotional discomfort, are perceived as being less employable than people who do not stutter, and are perceived as less intelligent or competent in a variety of jobs that require strong communication skills (e.g., teacher and lawyer). Research shows that PWS are aware of negative societal attitudes about themselves, which are often internalized. PWS often exhibit high levels of social anxiety, and it is thought that this is due to anticipated social penalties for stuttering (Boyle, 2017). A study conducted by Craig, Tran, and Craig (2003) looked at beliefs towards stuttering held by individuals who have never had direct contact with those who stutter. The results of the study reveal that people who stutter were mostly believed to be shy, anxious, self-conscious people who lack self-confidence. In comparison, other research suggests that positive attitudes towards PWS are related to how important individuals view their relationship with the person who stutters, how well they know them, and whether they have a good relationship with the person who stutters. An individual's perception of how well a person who stutters copes with their symptoms also significantly influences how they judge the person who stutters. Additional research points to the fact that as stuttering frequency increases, the more negatively a listener will evaluate that person's speech. Personally knowing PWS tends to reduce negative perceptions of PWS often because the listener views the known PWS based on that person's unique characteristics and personal experience with the known PWS, rather than solely on their stutter (Hughes, Gabel, & Palastik, 2017).

The social desirability bias (SDB) appears to have been overcome in the aforementioned studies which resulted in honest reports of negative attitudes towards those who stutter (Boyle, 2017). Boyle's study acknowledged SDB in saying that people tend to underreport stigmatizing beliefs about other groups of people in order to not be perceived as bigoted. SDB is something to

be considered when examining how people judge others and how honestly people report their judgements. A study on social desirability and attitudes towards the disabled highlighted the influence that social desirability has on how people judge others, particularly in the context of others who have a disability (Feinberg, 1967). Feinberg theorized that repeated exposure to campaigns featuring prominent leaders in government, business, entertainment, and more as people who are concerned with assisting those who are disabled has created a norm in society suggesting that kind treatment of the disabled is socially desirable. So it is to be expected that how a person judges those who are disabled, whether positive or negative, is a function of how strongly that person desires to be seen by society in a positive light. The results of Feinberg's study indicated that those who had high social desirability needs responded with significantly more positive attitudes towards people who are disabled as compared to those who did not have high social desirability needs (Feinberg, 1967). Additional research by Walden and Lesner (2018) specifically looked at SDB and stuttering and found that SDB predicts explicit attitudes toward stuttering. Explicit measures of attitude typically involve self-reporting. The authors noted that a greater tendency toward social desirability is associated with more positive self-reported attitudes toward people who stutter. So just as Feinberg's study found, those with high social desirability are more likely to report viewing those who stutter in a more positive manner (Walden & Lesner, 2018).

Autism, a type of language communication disorder, is a neurodevelopmental disorder characterized by deficits in social communication and interaction and the presence of restricted, repetitive behaviors. Social communication challenges consist of impairments in aspects of joint attention and social reciprocity and issues using verbal and nonverbal communicative behaviors in social interaction. Restricted, repetitive behaviors, interests, and activities are comprised of

repetitive speech, motor movement, inflexible adherence to routines, restricted interests, and hyper- and/or hypo-sensitivity to sensory input (ASHA; Autism Spectrum Disorder: Overview). Several studies have found that those with autism are deficient on tasks in which understanding mental states or recognizing emotions is necessary (Loveland, Pearson, Tunali-Kotoski, Ortegon, & Gibbs, 2001). Social communication difficulties also have an impact on those with whom ASD interact. Peers often feel ineffective when engaged in social interactions with an individual with ASD and may avoid that person or react in a negative way to the individual's social difficulties. If peers react in this way, this could have negative implications on the development of appropriate social skills (ASHA; Autism Spectrum Disorder: Overview). Research has shown that typically developing adults judge children with high-functioning autism as socially awkward. These findings suggest that typically developing individuals are less inclined to interact with individuals with high-functioning autism (Grossman, 2014). In high functioning autism, often the difficulty is with social interaction only, while other aspects of language are within normal limits. Therefore, these individuals may be overlooked as having a communication disorder and seen as socially different. This can be considered an "invisible" communication disorder.

Many children with communication disorders demonstrate deficits in reading and writing, as well as experiencing challenges with the social and behavioral skills necessary for school (Thatcher, Fletcher, & Decker, 2008). Without, or even with, a proper diagnosis of the communication disorder, children may struggle to academically keep up with their peers if the aforementioned challenges are not addressed and overcome. It is known that young people who engage in criminal activity typically have a history of poor school achievement, learning difficulties, and truancy. For those with communication disorders, it is evident that poor school

achievement is fairly likely. Particularly if an individual has not been formally diagnosed with a communication disorder and is not receiving treatment, they may feel that academic and social failure is inevitable and resort to crime—a self-fulfilling prophecy of sorts. Studies of prison populations suggest that the number of prisoners who have a communication disorder is significantly higher than that of the overall population (Bryan, Freer, & Furlong, 2007). Furthermore, research indicates that juveniles with these communication disorders may not have the necessary skills to handle verbally mediated interventions that aim to reduce recidivism (Bryan, Freer, & Furlong, 2007). This provides yet another obstacle that an individual with a communication disorder may not be able to get over without a diagnosis or treatment, creating a cycle in and out of the prison system. A screening in a juvenile detention center in Scotland revealed that 10% of the offenders who had been detained for more than three months had significant problems with speech, language, and communication abilities. Speech and language therapy has been proven to contribute to offenders being able to re-engage with educational and training provisions offered by the prison (Bryan, 2004).

Considering that individuals with communication disorders are often socially isolated and treated differently than their peers who do not have communication disorders, this study was interested in examining the perception of criminal behavior in individuals with communication disorders. More specifically, we predicted that individuals with communication disorders would be perceived as guilty because of their difficulty with speech and social interaction. Research has shown that individuals who stutter may avoid communicating in particular situations, may avoid answering questions because they are afraid they may stutter, or seem evasive in their responses to avoid stuttering (Tichenor & Yaruss, 2018). On the other hand, individuals with high functioning autism may say inappropriate things, or provide irrelevant information. Considering

that individuals with communication disorders are often socially isolated and treated differently than their peers who do not have communication disorders, this study was interested in examining how communication disorders may impact listeners' perceptions of guilt and other social attributes. More specifically, we predicted that individuals with communication disorders would be judged negatively because of their difficulty producing speech and/or language.

Method

Participants

Participants for the study were recruited from the Storrs/Mansfield and neighboring communities in the State of Connecticut. Every attempt was made to recruit participants from a variety of demographic levels including age, gender, and ethnicity. All participants had to be at least 18 years of age and have English as their primary spoken and written language. A total of 51 individuals participated in the study including 29 females and 22 males. A slightly higher number of females (n=29) than males (n=22) volunteered for the study. Participants ranged in age from 18 to 71 years of age and were primarily Caucasian. See Table 1 for a summary of the participants.

Table 1. Demographics of study participants.

Demographic variable	Value, N = 51
Gender	Number (%)
Female	29 (57%)
Male	22 (43%)
Ethnicity	Number (%)
Caucasian	42 (82%)
Hispanic	4 (0.08%)
Black	1 (0.02%)
Asian	2 (0.04%)
Biracial	2 (0.04%)
Age	Number (%)
18-19	17 (33%)

20-29	17 (33%)
30-39	2 (0.04%)
40-49	3 (0.06%)
50-59	8 (0.16%)
60-69	3 (0.06%)
70+	1 (0.02%)
Average age	30.96

Stimuli

Three male volunteers from the UConn undergraduate student population were recruited to act as speakers for the study. One speaker was a self-reported stutterer, another identified as having high-functioning autism, and the third speaker had no history of a speech or language disorder. For the purposes of the study, they were identified as a person who stutters (PWS), a person with high functioning autism (PHFA), and a person with no communication disorder (PNCD). They were between the ages of 18 and 25 years, were the same race, had a similar body type, and were speakers of Mainstream American English. According to the PWS, he had been diagnosed with a moderate to severe stuttering disorder (e.g., blocks, sound repetitions, word repetitions). The PHFA reported having difficulty with social interaction, but was within normal limits on receptive and expressive language (e.g., syntax and morphology). Therefore, the PWS had a speech disorder and the PHFA had a social-pragmatic language disorder. The speakers were told that the purpose of the study was to investigate listeners' perceptions of individuals with communication disorders, in particular judgments associated with trust, friendship, and criminal behavior. They were informed that they would be video and audio recorded and that

these recordings would be shown to participants in the study. Each speaker agreed to be recorded by providing written consent.

The speakers were brought to a quiet research laboratory at the University of Connecticut to record a narrative of them retelling a story. They were shown illustrations from the picture book, *Old MacDonald Had an Apartment House* (Barrett, 1998). Each picture from the book was digitized and imported to create a PowerPoint presentation with each picture presented one at a time in sequence via laptop computer with a 13.3-inch screen. The words from the book were eliminated to force the speakers to generate a story based on the pictures alone. They were provided with as many opportunities that they needed to review the pictures. Once they indicated that they had a good understanding of the story, the pictures were taken away, and they were asked to retell the story to the best of their ability. The purpose of retelling the story was to obtain a speech sample that was similar among the three speakers. To maintain the anonymity of the speakers and to minimize nonverbal cues, they were recorded from behind. Each speaker wore a baseball cap and a different colored t-shirt. The PWS wore a red shirt, the PHFA wore a blue shirt, and the PNCD wore a green shirt to make it easier for participants to refer to them later. Each speaker was filmed individually on separate days. The videos were recorded using an iPad Pro version 2 and the audio was recorded separately using an iPhone version XS to improve the quality of the auditory recording. The soundtrack was dubbed into the video recording using Final Cut Pro X version 10.4.8 on a 2019 MacBook Air. The final videos of the speech samples ranged from approximately three and half minutes to seven minutes and consisted solely of the retelling of the story from start to finish. The time for the story retell was the shortest for the PNCD and the longer retell was from the PWS because of his disfluencies.

Each narrative was manually transcribed and entered into the *Systematic Analysis of Language Transcripts* (*SALT* version 18; Miller & Inglesias, 2017) software. To examine the complexity of the narratives produced by the speakers, each narrative was divided into c-units with the following measures: 1) total number of c-units used per narrative, 2) mean length of utterance in words (MLUw) per c-unit, 3) average propositional density (Kahmi & Johnston, 1992) per c-unit, and 4) number of different words per narrative. These four factors were analyzed to show that the narratives produced were similar from a grammatical and semantic perspective. The *SALT* program was used to assist in the analysis of the aforementioned four factors. In order to calculate propositional complexity (Kamhi & Johnston, 1992), each utterance in each narrative was divided into c-units. Then the number of nuclear propositions and non-nuclear propositions were calculated. The total number of nuclear and non-nuclear propositions were tallied. This number was divided by the number of c-units which resulted in the average number of propositions per utterance. The results revealed that the PNCD used the most propositions per utterance, while the PHFA used the least propositions per utterance. In other words the PNCD included the most details in his narrative, while the PHFA speaker included the least details in his narrative. *SALT* automatically calculated the number of different words, MLU, and number of c-units. See Table 2 for a summary of each speaker's narrative.

Table 2. Summary of linguistic units per speaker's narrative.

	PNCD	PWS	PHFA
Propositional Complexity	4.02	2.93	2.63
# Different Words	212	189	222
MLUw	11.81	14.36	10
# C-Units	43	42	64

Procedure

The videos were shown to participants in either a research lab or a quiet private study room in a library. Participants were told that they would be watching three brief videos of three individuals telling a similar story and that their primary task would be deciding which of the individuals committed a crime prior to filming the video. Participants were not told of the full purpose of the study prior to participating and they were not told the categories of the speakers in order to collect unbiased data. Participants were told that the speakers could be identified by the color of their shirts. The speaker with the stutter was referred to as “the Red Individual”, the speaker with high-functioning autism was referred to as “the Blue Individual” and the non-impaired speaker was referred to as “the Green Individual” to keep their diagnoses hidden from the participants. The participants were told that in the videos, the speakers would retell the same story, *Old MacDonald Had an Apartment House* (Barrett, 1998). The participants were first given the opportunity to look through the same PowerPoint as the speakers so they would be familiar with the story. They were told to develop their own interpretation of the story just as the speakers did. Once they felt comfortable with the story, they were shown the videos of the speakers telling their stories. The videos were shown in a random order for each participant. The participants were instructed to watch and listen closely because they would be filling out a questionnaire that consisted of several questions about the three individuals after they had watched all three videos. The participants were given a blank piece of paper prior to watching the videos and were told to make note of anything they notice about each of the three individuals to better recall the details when they filled out the questionnaire. Each of the three videos were then shown to the participant on a 13.3-inch laptop screen. After all three videos had been viewed, the researcher verbally explained that one of the three individuals committed the crime

of larceny in the sixth degree at a local 7/11, stealing products totaling a value of \$376. The participants were not shown any video footage of a crime being committed. The participants were then given the questionnaire and were asked to fill it out with as much detail as possible. The participants were told that their answers would not be connected to their identity. The questionnaire consisted of the following questions:

1. What is your age?
2. What is your gender?
3. What is your ethnicity?
4. Which individual do you think committed the described crime?
5. What characteristics about the chosen individual informed your decision?
6. Which individual do you think you would trust the most? Why?
7. Which individual do you think you would trust the least? Why?
8. Which individual do you think you could have as a friend? Why?
9. Which individual do you think you would least likely want to have as a friend? Why?
10. Which individual retold the story the most accurately? Why?
11. Which individual retold the story the least accurately? Why?

After the participants finished filling out the questionnaire, the researcher collected it and then debriefed the participants. In the debriefing, the diagnoses of the three individuals were disclosed and the full purpose of the study was revealed. The participants were also informed that the criminal act was a made up scenario and that none of the speakers committed the described crime. The participants had the opportunity to withdraw their consent after being

debriefed up until the end of the day they participated in the study. The total completion time for each participant was approximately 30 to 40 minutes.

Scoring

An Excel spreadsheet was created to enter scoring data. Seven tabs were created within the spreadsheet to correspond to each of the seven questions that the participants answered on the questionnaire. Each tab had a row for each of the 51 participants. There were three columns in each participant's row corresponding to each of the three individuals: PWS (Red Individual), PNCD (Green Individual), PHFA (Blue Individual). The individual that was selected by the participant received a score of 1, while the individuals that were not selected by the participant received a score of 0. If a participant declined answering a question, a blank answer received a score of "n/a". This method of scoring was repeated for each question for every participant. The number of 1's for each individual for each question were calculated to determine how many participants selected each individual. The participants were also asked to describe why they selected their chosen individual for each question. Therefore, a two part scoring system was used.

Reliability

In order to determine reliability of the data coding, 20% of the questionnaires were scored by a second research assistant. The second research assistant filled out a spreadsheet identical to the one the experimenter filled out. The research assistant's scores were then compared to the experimenter's coding of the data. A comparison of the two scores indicated that there was 100% agreement between coders indicating a high reliability of the scoring procedures.

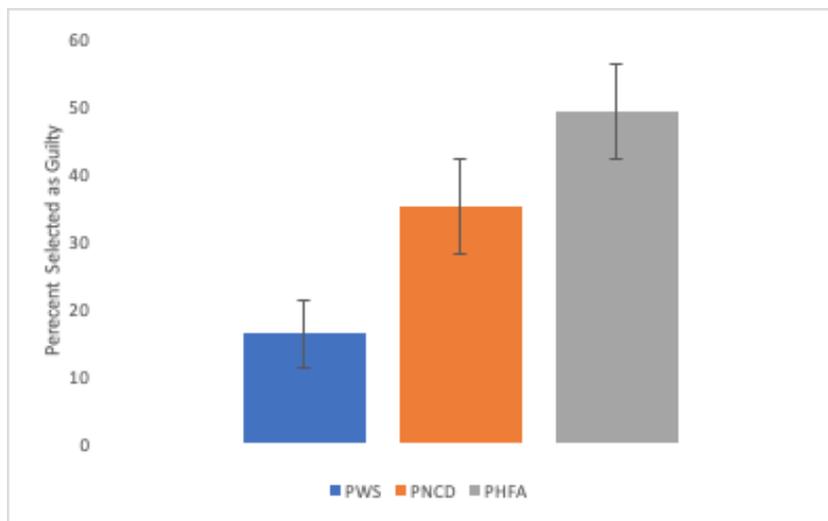
Results

On the questionnaire, participants were asked to select one of three answer choices. Because there were limited options (PWS, PNCD, or PHFA), a chi square analysis was used to examine for significant differences between speakers. If a significant chi square was found, then Mann Whitney U-tests were conducted to determine where the significant was. Significance levels were set at .05 for all analyses. The speakers were the independent variable and the speaker that the participant selected was the dependent variable for each question. The results of the chi square analysis revealed that of the seven questions, three were significant: Question 1, Question 3, and Question 4.

Question 1 was: Which individual do you think committed the described crime?

For this question, 8 participants selected the PWS as the guilty individual, 18 participants selected the PNCD as the guilty individual, and 24 participants selected the PHFA as the guilty individual. The chi square analysis revealed that the results for this question were significant ($X^2(2) = 12.882, p=.002, \text{Cramer's } V = .290$). See Figure 1 for the percentage of responses in favor of each individual. Because the results were significant, Mann Whitney U-tests were conducted to determine where the significant difference occurred. There was no significant difference between the PHFA and the PNCD, but there were significant differences between the PHFA and the PWS ($U = 867, p > .0001$) and the PNCD and the PWS ($U=1045.5, p = .024$).

Figure 1. Percent of participants identifying each speaker as guilty of the crime (and standard errors).¹

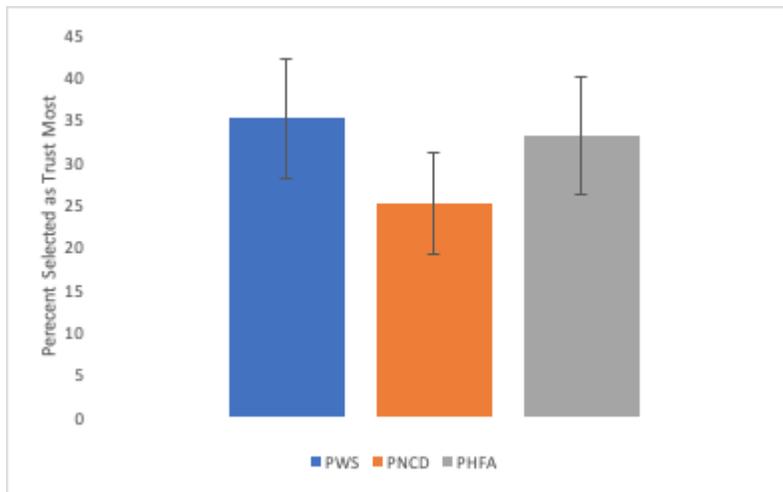


Question 2 was: Which individual do you think you would trust the most?

For this question, 18 participants selected the PWS as the person they would trust the most, 13 participants selected the PNCD as the person they would trust the most, and 17 participants selected the PHFA as the person they would trust the most. See Figure 2 for the percentage of responses for each speaker. The chi square analysis revealed that the results for this question were not significant. All differences were greater than the .05 level of significance.

¹ In some figures, the percentages may not add up to 100% because some participants declined to answer certain questions.

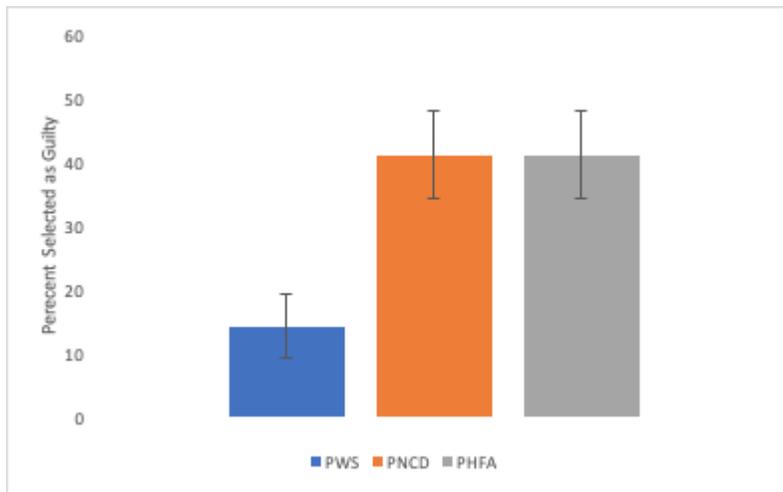
Figure 2. Percent of participants identifying each speaker as someone they would trust the most (and standard errors).



Question 3 was: Which individual do you think you would trust the least?

For this question, 7 participants selected the PWS as the speaker they would trust the least, 21 participants selected the PNCD as the speaker they would trust the least, 21 participants selected the PHFA as the speaker they would trust the least. See Figure 3 for the percentage of responses for each speaker. The chi square analysis revealed that the results for this question were significant ($X^2(2) = 12.537, p = .002$, Cramer's $V = .286$). Mann Whitney U-tests revealed there was no significant difference between the PHFA and the PNCD, but there were significant differences between the PHFA and the PWS ($U = 918, p > .001$) and the PNCD and the PWS ($U = 943.5, p = .002$).

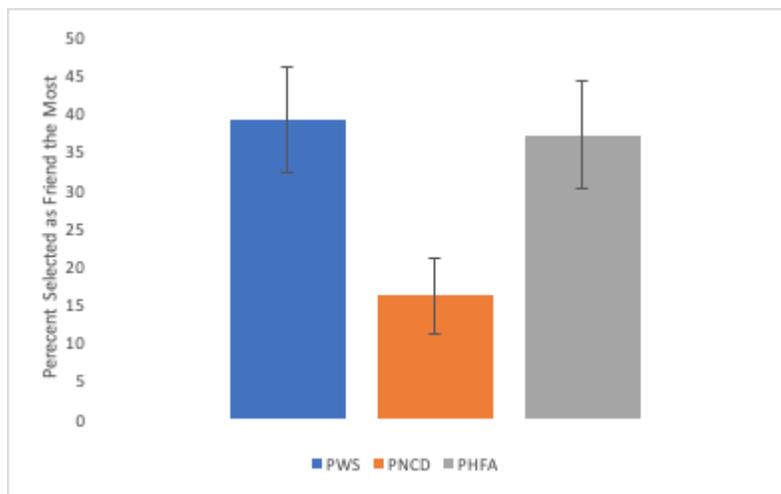
Figure 3. Percent of participants identifying each speaker as the least trustworthy (and standard errors).



Question 4 was: Which individual do you think you could have as a friend?

For this question, 20 participants selected the PWS as the person they could have as a friend, 8 participants selected the PNCD as the person they could have as a friend, and 19 participants selected the PHFA as the person they could have as a friend. See Figure 4 for the percentage of responses in favor of each individual. The chi square analysis revealed that the results for this question were significant ($X^2(2) = 8.648, p = .013, \text{Cramer's } V = .239$). Mann Whitney U-tests revealed there was no significant difference between the PHFA and the PWS, but there were significant differences between the PHFA and the PNCD ($U = 963.5, p = 0.11$) and the PWS and the PNCD ($U = 939, p = .006$).

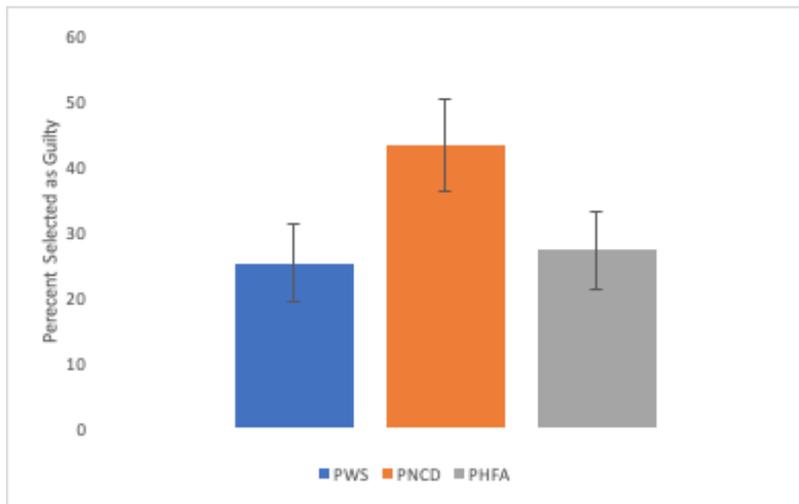
Figure 4. Percent of participants identifying each speaker as someone they could have as a friend (and standard errors).



Question 5 was: Which individual do you think you would least likely want to have as a friend?

For this question, 13 participants selected the PWS as the person they would least likely want to have as a friend, 22 participants selected the PNCD as the person they would least likely want to have as a friend, and 14 participants selected the PHFA as the person they would least likely want to have as a friend. See Figure 5 for the percentage of responses in favor of each speaker. The chi square analysis revealed that the results for this question were not significant. All measures were greater than the .05 level of significance.

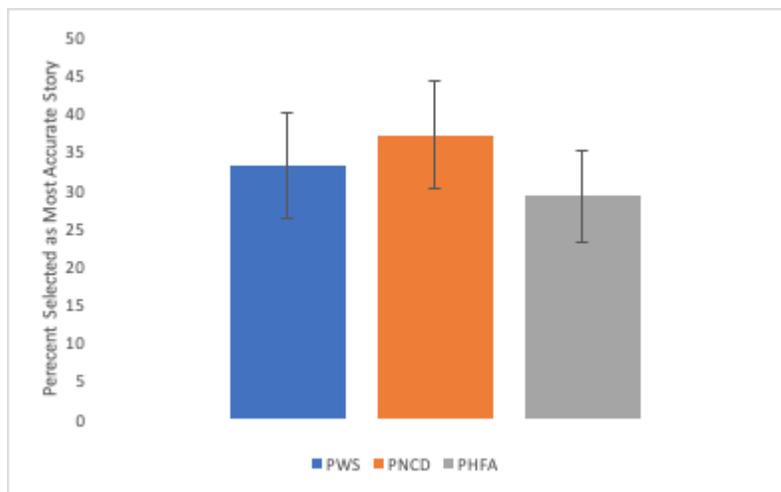
Figure 5. Percent of participants identifying each speaker as someone they would least likely want to have as a friend (and standard errors).



Question 6 was: Which individual retold the story the most accurately?

For this question, 17 participants selected the PWS as the person who retold the story the most accurately, 19 participants selected the PNCD as the person who retold the story the most accurately, and 15 participants selected the PHFA as the person who retold the story the most accurately. See Figure 6 for the percentage of responses in favor of each speaker. The chi square analysis revealed that the results for this question were not significant. All measures were greater than the .05 level of significance.

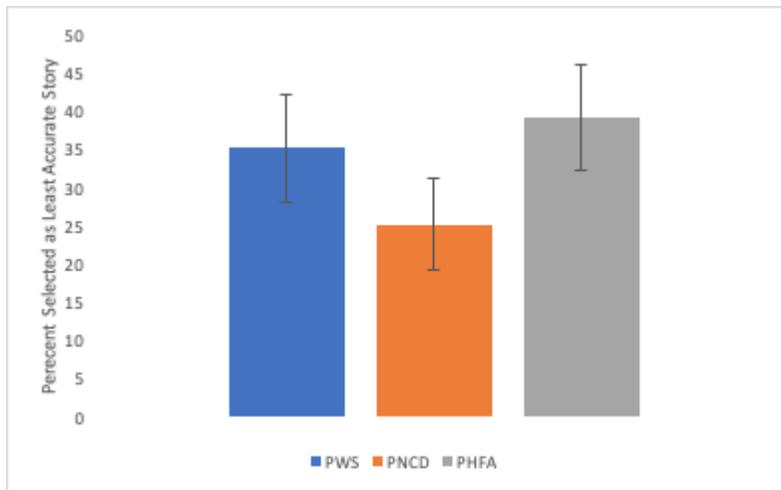
Figure 6. Percent of participants identifying each speaker as the person who retold the story the most accurately (and standard errors).



Question 7 was: Which individual retold the story the least accurately?

For this question, 18 participants selected the PWS as the person who retold the story the least accurately, 13 participants selected the PNCD as the person who retold the story the least accurately, and 20 participants selected the PHFA as the person who retold the story the least accurately. See Figure 7 for the percentage of responses in favor of each speaker. The chi square analysis revealed that the results for this question were not significant. All measures were greater than the .05 level of significance.

Figure 7. Percent of participants identifying each speaker as the person who retold the story the least accurately (and standard errors).



Qualitative Results

In addition to being asked to select one of the three individuals for each of the seven questions, participants were asked to write an explanation of their selection. See Tables 3-9 for common responses for each question.

Table 3. Common explanations for each selected individual for Question 1: Which individual do you think committed the described crime?

Selected Individual	Common Explanations
PWS	<ul style="list-style-type: none"> ● This was the only individual that stood out as the other two were so similar in the way they told the story ● Maybe he experienced bullying and neglect due to his disorder which would make him more likely to commit a crime ● There were times when his stutter would get worse like when he was telling anecdotal things that he would not know ● Because he was stuttering throughout

	<p>his description</p> <ul style="list-style-type: none"> ● He was constantly using words like “um” and was having trouble speaking which suggests he was thinking about the crime he committed and because his mind was overwhelmed with that, he couldn’t remember the story clearly ● His stutter seemed fake ● Seemed to be nervous ● There was a lot of fidgeting and filler words ● Many of their sentences ended with up-talk in their voice as if they were asking a question
PNCD	<ul style="list-style-type: none"> ● Fast pace while speaking/felt rushed ● Nervous/mumbling while telling the story ● Lacked emotion when he was talking ● Matter-of-fact tone
PHFA	<ul style="list-style-type: none"> ● Sounded uncomfortable ● Seemed to not care about the story ● Was joking around a bit ● Seemed the most confident in his recall of events as if he had planned what he would say/sounded rehearsed ● He seemed to be trying to cover up for where people were at certain times and being descriptive as to a timeframe ● His story had the most creative storytelling that was made up/not in the book ● Was breathing heavy ● Seemed nervous ● Very time-detailed in his description ● Overall negative description of the story

Table 4. Common explanations for each selected individual for Question 2: Which individual do you think you would trust the most?

Selected Individual	Common Explanations
PWS	<ul style="list-style-type: none"> ● Seemed to be fairly straightforward

	<ul style="list-style-type: none"> ● He was trying very hard to tell an accurate story despite having difficulty with his speech ● Seemed the most genuine ● His story was the most by-the-book focusing on actual details from the images ● Positive storyline ● Described character’s feelings
PNCD	<ul style="list-style-type: none"> ● Was calm during the story ● Appears honest ● Had the most concise story ● Used the most pleasant language ● Seems very straightforward and intelligent
PHFA	<ul style="list-style-type: none"> ● Calm/upbeat tone ● Seemed the most approachable ● Story was very thorough and detailed ● Talked about how the characters in the story are feeling ● Seemed the most convincing in his arguments/established the most credibility ● He was the most confident in his speaking and his recollection of the story

Table 5. Common explanations for each selected individual for Question 3: Which individual do you think you would trust the least?

Selected Individual	Common Explanations
PWS	<ul style="list-style-type: none"> ● He does not seem like a reliable source ● He kept mentioning irrelevant details and tapering off ● Because he was stuttering a lot ● His voice was annoying
PNCD	<ul style="list-style-type: none"> ● Sounded nervous ● Depicted Old MacDonald in a negative light ● Seemed very cold and impersonal in the way he spoke

PHFA	<ul style="list-style-type: none"> ● Was joking around when telling story ● Noticed some flaws in the story he told ● Showed some discomfort ● Trying too hard to justify small details of the story ● Did not sound honest ● Embellished the story a lot ● He took too much creative liberty justifying problematic actions ● I recalled details differently than he did
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Table 6. Common explanations for each selected individual for Question 4: Which individual do you think you could have as a friend?

Selected Individual	Common Explanations
PWS	<ul style="list-style-type: none"> ● Seemed to enjoy retelling the story ● Seemed the most interested and the most fun to talk to ● I like friends who I can trust and I feel like I can trust him ● Had a kind easy going tone ● He sounded the most genuine ● He seemed like someone who would be kind and thoughtful ● Feel like he would have an interesting perspective on life
PNCD	<ul style="list-style-type: none"> ● His recall of the story generally agreed with mine or added to my recall of the story
PHFA	<ul style="list-style-type: none"> ● Seems nice, friendly, personable, laid-back, calm ● I liked his version of the story the best ● He explained why people didn't like what Old MacDonald did which shows self-awareness ● His confidence and trustworthiness are why I would want him to be my friend because I want a friend that I can trust

Table 7. Common explanations for each selected individual for Question 5: Which individual do you think you would least likely want to have as a friend?

Selected Individual	Common Explanations
PWS	<ul style="list-style-type: none"> ● He seemed very shaky and not confident with what he was saying ● He seemed like someone who would rat on you by the way he made assumptions ● He kept nervously repeating things ● Said way too much ● He seemed to be constantly thinking about something else ● Difficult to listen to because of his stutter ● Doesn't pronounce words correctly ● Repeats himself ● Seemed to take a long time to tell a story
PNCD	<ul style="list-style-type: none"> ● Seemed untrustworthy and rushed ● He was more monotone ● Seemed creepy and harsh ● Did not demonstrate any signs of being friendly ● I think he would be the least fun
PHFA	<ul style="list-style-type: none"> ● He seemed dishonest ● Trying too hard to say the right things ● Don't trust their willingness to embellish ● Wouldn't want to be around them trying to determine what is or isn't genuine about them

Table 8. Common explanations for each selected individual for Question 6: Which individual retold the story the most accurately?

Selected Individual	Common Explanations
PWS	<ul style="list-style-type: none"> ● The retelling was thorough and took the feelings of all the characters into account

	<ul style="list-style-type: none"> ● Had the least flaws and made the most sense ● Mentioned the most specific examples of the story and used the most effort to tell the story ● He didn't add in his own assumptions about why a character took certain actions
PNCD	<ul style="list-style-type: none"> ● Most straightforward retelling ● Seemed basic but accurate ● Told the story with the most detail/paid attention to detail
PHFA	<ul style="list-style-type: none"> ● He included a good amount of detail and remembered the important parts

Table 9. Common explanations for each selected individual for Question 7: Which individual retold the story the least accurately?

Selected Individual	Common Explanations
PWS	<ul style="list-style-type: none"> ● He made less assumptions which would have helped the flow ● Was accurate but did not describe the story in enough detail ● He kept injecting assumptions about how people felt ● Certain parts of the story were repeated
PNCD	<ul style="list-style-type: none"> ● His story was the shortest so it included the least amount of extra details ● Some details were subjective
PHFA	<ul style="list-style-type: none"> ● Was not fact-oriented and instead had to offer many irrelevant opinions of his own to convey his ideas ● Added a lot of details ● Added the most backstory that he made up/implied ● His recollection seemed very general

Discussion

The purpose of the present study was to examine the perception of guilt and other social attributes for individuals with communication disorders. An individual with no history of a speech or language disorder was used as a comparison. Research has shown that individuals with communication disorders are often isolated by others and treated differently than peers who do not have communication disorders (e.g., Boyle, 2017; Craig, Tran, & Craig, 2003; Hughes, Gabel, & Palastik, 2017). In particular, the general public has little experience interacting with people who stutter and they are often attributed to having negative personality traits (Boyle, 2017). People who stutter have obvious speech characteristics including sound repetitions, word repetitions, phrase repetitions, and secondary behaviors such as eye blinks, hand gestures, and silent blocks (National Institute of Health, 2016) which can be viewed as unattractive and distracting to the listener. Therefore, they present with a visible communication disorder. In comparison, people with high functioning autism have relatively good speech and language, but are viewed as socially awkward. They can be perceived as struggling in social settings, exhibiting unexpected or strange behaviors, and say things that can be considered inappropriate. These can be viewed as character flaws or mental health issues rather than a communication disorder, thus, we can consider this an invisible communication disorder. Research has also shown that individuals with speech or language disorders have a high representation in prisons (Bryan, Freer, & Furlong, 2007). Therefore, there is reason to suspect that they may be viewed negatively by the criminal justice system. Based on these factors, we predicted that individuals with communication disorders would be judged negatively because of their difficulty producing speech and/or language in comparison to an individual with no history of a speech or language disorder. The results of the study did not support this hypothesis in that the person who stuttered

was perceived more positively on three of the seven questions in comparison to the person with no communication disorder. The person with high functioning autism was judged to have a greater number of negative attributes on several of the questions, but this was not significant from the person with no communication disorder. The findings of this study will be considered under each question below.

Question 1: Which individual do you think committed the described crime?

For this question, there was a significant difference between the speakers. Participants judged the PHFA and the PNCD as equally likely to be guilty of the crime, while the PWS was seen as the least likely to be guilty of the crime. On nearly all of the participant's questionnaires, they identified the person with the red shirt as having a stutter. Therefore, the majority of participants recognized that the PWS had a communication disorder. A small number of participants commented that the stutter was fake and identified him as the guilty party. On the other hand, not one participant identified the PHFA as having a social-pragmatic disorder. Therefore, it was believed that the listeners did not consider him to have a communication disorder. Since the PWS was picked the least as the guilty individual, it is hypothesized that having a disability reduces the probability that that person will be judged as guilty by his or her peers. Being tolerant of those with disabilities is seen as something socially desirable, so it is likely that the social desirability bias played a role in these results. It would not be socially desirable for a person to think negatively of another person who has an obvious, or visible, disability. The recognition that the PWS had a stutter likely discouraged people from choosing him as the guilty individual, which left the other two individuals as the "safer" and more socially acceptable choices.

Based on the fact that the PWS was easily identified by nearly all participants as a stutterer, there are two possible explanations for selecting him less frequently. The first possibility is the influence of the social desirability bias where participants did not want to be viewed negatively by the experimenter. The participants were informed that their responses would be kept confidential, but they also knew that the experimenter would read their responses. This may have influenced their responses so that they would not be viewed as discriminating against an individual with a disability. The other possibility is that the participants truly had sympathy towards the PWS and believed that he could not have committed a crime. We have been educated about being sensitive to people who are different and have been exposed to anti-bullying campaigns. Therefore, it is possible that the general public is more sympathetic towards people with disabilities. Both possibilities make sense in that the PHFA and the PNCD were selected as most likely to have committed the crime. While the PHFA did have a disability, it was not obvious, and participants may have viewed him the same as the PNCD. Overall, the results of Question 1 reveal that individuals with a visible communication disorder are less likely than those with invisible communication disorders and no communication disorder to be perceived as guilty of a crime.

Question 2: Which individual do you think you would trust the most?

For this question, there was no significant difference between any of the speakers. An explanation for why a significant difference was not seen in this question but a significant difference was seen in the oppositely worded Question 3 could be that the phrasing of being trusted “the most” sounds more positive than being trusted the least. Some participant comments for this question included, “*Seemed the most genuine,*” “*Used the most pleasant language,*” “*Seems very intelligent,*” and “*Seemed the most approachable.*” These are all positive

descriptors, which are not as difficult for someone to write about another person as negative descriptors are. For most people, it is not comfortable or socially desirable to describe someone negatively. As such, participants may not have felt pressured to choose the individual with the visible disability since not choosing another individual over the individual with the visible disability would not necessarily reveal a negative attitude towards the individual with the visible disability. Another possibility, as noted by one of the participants, is that there was not enough information provided in the narrative for them to make a judgment about the trustworthiness of the speakers. Therefore, neither a speech or language disorder influenced the participants to choose in a particular way, therefore, the speakers were selected no greater than chance.

Question 3: Which individual do you think you would trust the least?

For this question, there was a significant difference between the speakers. The PHFA and the PNCD were selected the most frequently as the person the participants would trust the least, while the PWS was chosen significantly less. A possible explanation for this result could again be the social desirability bias as examined in the discussion of Question 1. Some of the comments by the listeners for the PHFA and the PNCD were, "*Sounded nervous,*" "*Seemed cold and impersonal,*" "*Embellished the story a lot*" and "*Did not sound honest.*" These are reasons that could understandably make someone appear less trustworthy. An explanation for why a significant difference was seen in this question but not in the oppositely worded Question 2 could be that the phrasing of being trusted "the least" sounds more negative than being trusted the most. As such, the social desirability bias may have been more prevalent because participants may have wanted to avoid associating the individual with the visible disability with something with a negative connotation like being trusted "the least." Again, the listeners could have been more sympathetic to the PWS as in Question 1.

Question 4: Which individual do you think you could have as a friend?

For this question, there was a significant difference between the speakers. On this question, the two speakers with communication disorders were selected more frequently than the speaker with no communication disorder. It is possible that there was something in the speakers' narratives that the participants were able to identify as having a possible quality that would attract others as a potential friend. Some of the comments by the listeners for both speakers were, *"Seemed to enjoy retelling the story," "He sounded the most genuine," "Had a kind easy going tone," "Seems nice, friendly, personable, laid-back, calm,"* and *"His confidence and trustworthiness are why I would want him to be my friend because I want a friend that I can trust."* These are positive attributes that individuals seeking friends are likely to desire. Since the listeners were not able to see the participants, except from the back of their upper torso and head, no nonverbal information was available. The listeners could only cue into speech patterns, language used, and suprasegmental patterns such as tone, stress, speech rate, and disfluencies in the case of the PWS. For the PWS, it is possible that the listeners selected him because of his stutter. This could have been due to the social desirability bias or sympathy for someone with a disability. Another possibility is that the characteristics of his speech, selected language, and suprasegmental patterns were more appealing than the PNCD. This could have been the case for the PHFA. This would be consistent with the reports of the listeners of the positive language attributes such as *"sound genuine"* or *"seems nice, friendly, personable."* Additionally, the linguistic analysis of each speaker's narrative revealed that the PNCD had the most propositional complexity. Perhaps an individual who uses more descriptive language is not as appealing as individuals who use less complex and straightforward language.

Question 5: Which individual do you think you would least likely want to have as a friend?

For this question, there was no significant difference between any of the individuals. We assumed that this would not contradict the selection of individuals from the previous questions, but it is possible since the results of the PCND did not differ significantly from the two speakers with communication disorders. On this question, the speakers were selected equally statistically. However, an examination of the results showed that the PNCD was selected with the highest frequency, but not statistically different. This lack of difference may have been due to low statistical power. Some of the comments about the PNCD included “*Seemed creepy and harsh,*” “*Did not demonstrate any signs of being friendly,*” and “*Seemed untrustworthy and rushed.*” These are the kinds of attributes that one would least likely seek in a friend.

Question 6: Which individual retold the story the most accurately?

For this question, there were no significant differences between any of the individuals. A possible explanation for this is that each participant likely had a different interpretation of the story, and thus each speaker had an equal chance of being the person that retold the story in a way that most closely aligned with the participant’s interpretation. Some of the comments about the three individuals included, “*He remembered the important parts,*” “*Seemed basic but accurate,*” “*Used the most effort to tell the story,*” and “*Had the least flaws and made the most sense.*” All of these comments are fairly subjective and largely rely on the participant’s own interpretation of the story. It is also possible that the participants thought that each speaker told the story accurately, but since they were forced to choose one speaker over the other, one would expect that differences between the speakers would be no better than chance. This is what happened with this question.

Question 7: Which individual retold the story the least accurately?

For this question, there were no significant differences between any of the individuals. A possible explanation for this is the same reason given above for Question 6 in that each participant likely had a different interpretation of the story, and thus each individual had an equal chance of being the one that retold the story in a way that most closely aligned with the participant's interpretation and the limitations of a forced choice task.

Limitations

Some limitations of the present study should be acknowledged. One of the major weaknesses of this study was the relatively small participant pool. 51 participants were recruited for this study so it is likely that with a larger participant pool of a few hundred participants additional trends would emerge due to increased statistical power. Increased statistical power would likely reveal additional significant differences within more of the questions and, in turn, lead to an even more conclusive study. Another limitation of the study was having the participants forced to choose a speaker. A forced choice question does not allow participants the response options of "not sure," or the option to select more than one response. There was no way for the participants to indicate that they did not like the choices they were given other than stating it in their explanation or declining to respond to the question. An additional limitation of the study is the fact that the speakers were recorded from behind. Due to this, participants were not able to see the speakers' facial expressions which could have been used to further inform their responses to each question.

Clinical Implications

While previous research suggests that people who stutter are judged negatively (e.g., Boyle, 2017; Craig, Tran, & Craig, 2003; Hughes, Gabel, & Palastik, 2017), this study reflects the opposite in that the PWS was perceived the least negatively in comparison to the PNCD and the PHFA. This finding can be useful in counseling provided by speech-language pathologists when dealing with a PWS. It is not uncommon for a PWS to feel insecure about their stutter (Boyle, 2017), and because of this, counseling is often an important part of treatment. A speech-language pathologist working with a PWS can point to this study that exemplifies stuttering in a more positive light. This study may be encouraging to those who stutter as it shows they are more likely to be given the benefit of the doubt and perhaps looked at with more understanding because people are able to recognize that they have a disability. Although a PWS may not like the fact that their disability is noticeable, a speech-language pathologist can provide comfort with this study that suggests it can be beneficial to have a visible disability.

This study also has clinical implications for people with high-functioning autism. As discovered in this study, participants were unable to detect that the PHFA had a disability. Therefore, the PHFA may not have received the same amount of sympathy or understanding as the PWS received. The invisibility of high-functioning autism could have served to be a detriment for the PHFA in this experiment. Question #4's significant results are important to note because this is the one case where participants seemingly detected a difference between the PHFA and PNCD but were not able to describe exactly what made these two speakers different. On the other hand, in the other two significant questions, no difference was detected between the PHFA and PNCD. So, the favorable perception was more consistent with the PWS. This is not surprising as past research shows that typically developing individuals are less inclined to

interact with individuals with high-functioning autism, presumably regardless of if that diagnosis is known (Grossman, 2014). Overall, this study suggests that a visible communication disorder is advantageous in comparison to invisible communication disorder, so it could be important to encourage those with high-functioning autism to disclose their diagnosis more often. Disclosing their diagnosis would likely result in people being friendlier, more sympathetic, and more understanding. This encouragement can be incorporated into the counseling speech-language pathologists provide to those with high-functioning autism.

Conclusions

The purpose of this study was to determine the perceptions of people with visible and invisible communication disorders. This study suggests that those with visible communication disorders (e.g., stuttering) are perceived more favorably than those with invisible communication disorders (e.g., high-functioning autism) and those with no history of a communication disorder. The results of this study not only have clinical implications, but have implications in the context of the criminal justice system. The primary task of the experiment was determining which of the three individuals would be judged as guilty of a crime most frequently. As such, the results of the study can be extended to the criminal justice system in that investigators, court personnel, and jury members should be aware of and educated on both visible and invisible disabilities, and recognize how their own biases and sympathy towards those with disabilities, whether hidden or obvious, may influence decisions they are responsible for making. It may be important to recommend or require additional training for those involved in the criminal justice system that addresses this matter.

Although this study is able to conclude that those with visible communications disorders are perceived more favorably, additional modifications to this study could result in additional conclusions about those with invisible communication disorders. In the future, this study could be expanded by having participants go through the same procedure, but then giving participants the opportunity to change any of their answers after finding out the communication abilities of each speaker. If many participants who choose the PHFA as their response for the more negative questions end up changing their answers to the PNCD, this would provide further support that the social desirability bias and/or sympathy influences how people make judgements about those with disabilities. Additionally, it would reflect an even more crucial need for education about invisible disabilities.

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