

**Do you hear what I hear? Analyzing the influence of interventions on attitudes,  
perspective taking, and empathy towards individuals with schizophrenia**

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### Abstract

The present study analyzed different factors of an intervention designed to influence attitudes, perspective taking, and empathy towards individuals with schizophrenia. A total of 123 participants observed another person experience a simulation of auditory hallucinations while completing everyday tasks. Forty-three participants experienced the context of the auditory hallucinations; 38 experienced the context of the auditory hallucinations and the reactions of the person in the simulation, and 42 watched a person in the simulation complete tasks without hearing their reactions or the auditory hallucinations. The results showed that the context of auditory hallucinations and the person's reactions did not influence attitudes, perspective taking, and empathy towards individuals with schizophrenia. However, female participants showed significantly less stereotype endorsement and negative attitudes; their scores also reflected significantly more perspective taking and empathy towards individuals with schizophrenia. Therefore, future studies should examine how gender and factors of interventions (e.g., educational, interactive, and observational) impact attitudes, perspective taking, and empathy towards individuals with schizophrenia.

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## Introduction

Historically, when individuals experienced mental health issues, such as distressing hallucinations that may coincide with schizophrenia, they were deemed to be possessed by evil spirits, "hysterical" or "defective" in some nature (Kyziridis, 2005). This often resulted in individuals struggling with mental health issues to be abandoned or sent to institutions that restricted daily activities and mobility; before antipsychotics were developed in the 1950s, there many unsuccessful and brutish attempts to ease or cure schizophrenia, such as "injecting sulfur and oil, causing abscesses...gas therapy, sleep therapy, insulin therapy, electroconvulsive treatment and lobotomies (Kyziridis, 2005, p 46). While today more people seek professional help for mental health issues, having a condition, like schizophrenia, can still be stigmatizing and may result in ostracization from families, friends and communities (Fink & Tasman, 1992).

Due to the negative ramifications that result from a lack of social supports when dealing and treating mental illness, different interventions have been created to try to increase the empathy health care workers and others feel towards individuals diagnosed with mental health issues, such as schizophrenia (Chaffin & Adams, 2013). The current study builds upon the previous interventions that have been created and examines which features are most important in an intervention to reduce stereotyping and increase empathy and perspective taking. More specifically, we adapted an intervention conducted by Skoy and colleagues(2016) such that participants viewed a person complete six tasks while listening to auditory hallucinations, a common symptom of schizophrenia. We examined whether watching someone conduct tasks while listening to auditory hallucinations was enough to change attitudes, or if the intervention was more effective if

the person viewing it could also hear the auditory hallucinations. In addition, we also examined whether exposure to the immediate reactions after completing each task influenced attitudes towards individuals with schizophrenia, perspective taking, and empathy.

### **Schizophrenia and Auditory Hallucinations**

Schizophrenia is a mental health condition in which a person experiences a disconnect with reality, and between 0.25% and 0.64% of the population in the United States is diagnosed with this disorder (NIMH, 2019). Individuals with schizophrenia may experience what are referred to as negative symptoms (e.g., behavioral or emotional issues) or positive symptoms (e.g., hallucinations, delusions; NIMH, 2019). One symptom that is estimated to occur for approximately three-quarters of the individuals diagnosed with schizophrenia in the United States is auditory hallucinations (Batcho, 2018).

Auditory hallucinations may also be referred to as hearing voices inside one's head (Batcho, 2018). In and of themselves, auditory hallucinations are not a sole indicator of a mental health disorder, and some people in the general population may experience auditory hallucinations (Batcho, 2018; de Leede-Smith & Barkus, 2013; Johns et al., 2014). However, auditory hallucinations are most linked with schizophrenia, potentially due to the high prevalence of it as a symptom for individuals with this disorder in the United States. Including commonly portraying a connection of auditory hallucinations to schizophrenia, much of published media alludes to a connection between auditory hallucinations and "criminal behavior, violence and suicidality" (Vilhauer, 2015, p 1); Furthermore, this symptom has been a focal point for many studies that have investigated

different interventions to help reduce the stigma associated with schizophrenia (Ando, Clement, Barley, & Thornicroft, 2011).

### **Schizophrenia and Stigma**

For people living with schizophrenia, stigmatization and discrimination are experienced on a regular basis (van Zelst, 2009). Individuals with schizophrenia are often characterized as being dangerous, violent, unstable, and criminals (Owen, 2012). In addition, individuals with schizophrenia commonly report that they are perceived by others as lacking willpower as well as being lazy and dangerous (González-Torres et al., 2007). Media representations further exacerbate these negative misperceptions. In a review of how characters with schizophrenia are portrayed in the media, it was found that most characters exhibit violent behavior, often committing acts of homicide or suicide (Owen, 2012). Video game portrayals are also overwhelmingly negative. A review of over 100 video games found that 97% of the video games reviewed promoted negative stereotypes of mental illness in general (Ferrari et al., 2019). A review of news articles found that most suggested a connection to schizophrenia and behaviors such as criminal activity and violence towards themselves and others (Vilhauer, 2015). One issue with how schizophrenia is portrayed in the media is that this may be the only point of reference someone has about the disorder (Owen, 2012). Furthermore, these depictions are inconsistent with rates of violence—as those with mental illness are likely to be victims of violence rather than commit acts of violence towards others (Stuart, 2003).

The stigmatization of individuals with schizophrenia goes beyond media portrayals and has real implications on quality of life. Due to the stigma of the disorder, people living with schizophrenia have limited access to quality mental and physical healthcare providers

and services, experience high rates of unemployment, may have a hard time finding housing, and experience high rates of social isolation (Kadri & Sartorius, 2005). In fact, due to the stereotypes surrounding schizophrenia (e.g., unpredictable nature, dangerousness), others tend to engage in social distancing behaviors and beliefs towards those with schizophrenia (Angermeyer & Matschinger, 2004). The stigmatization and discrimination experienced so readily may also lead individuals with schizophrenia to self-isolate from others to protect themselves from further stigmatization and discrimination, as found by González-Torres and colleagues (2007). The self-isolation of these individuals in combination with social distancing by others then only increases limited access to important and necessary resources and social interactions and relationships.

### **Reducing Stigma Towards Schizophrenia**

Given the high rates of stigma that exist for individuals with mental health conditions, researchers have begun to explore different approaches and interventions in an attempt to reduce stigma towards mental health (Dalky, 2012). Some interventions are more educational in nature (e.g., reading articles or using computer learning technologies), while other interventions are more interactive in essence and try to get participants to experience what it would be like to experience symptoms of schizophrenia, and yet some interventions rely on observations. For example, Finkelstein, Lapshin, and Wasserman (2007) compared two education-based interventions that were designed to reduce stigma towards individuals with mental health issues with students studying special education. Half the participants engaged in an intervention in which they read two articles about psychiatric stigma. The other half of participants learned about psychiatric stigma through a computer program called CO-ED (Computer-assisted Education) that guided participants

through the stereotypes, prejudices, and discriminations that individuals with psychiatric disorders experience. Attitudes towards individuals with mental health and the extent to which one would socially distance from them were measured immediately after each intervention and again six months later. Finkelstein and colleagues (2007) found that immediately after the interventions, both groups showed reductions in negative attitudes and a decrease in the desire to socially distance. However, six months after the interventions, those who read the articles were more likely to endorse more negative attitudes and desire social distance than those who engaged with the CO-ED program.

In addition, some research has investigated more interactive interventions. For instance, in one such intervention, nursing students completed a series of everyday tasks while listening to auditory hallucinations, a common symptom of schizophrenia (Chaffin & Adams, 2013). Participants reported the amount of empathy they felt towards individuals with schizophrenia before and after the intervention. Empathy towards those with schizophrenia significantly increased after the intervention. These nursing students also reported that this experience was transformative in their understanding of schizophrenia and increased their understanding of the disorder (Chaffin & Adams, 2013). Similarly, Skoy and colleagues (2016) had pharmaceutical students complete a series of everyday tasks while listening to auditory hallucinations. As with the Chaffin and Adams (2013) intervention, these pharmaceutical students reported more empathy towards individuals with schizophrenia after the interactive intervention; they also articulated that the intervention would have a long-lasting impression on them as they embarked on their careers as pharmacists (Skoy et al., 2016).

The overall use of auditory hallucinations as a simulation intervention tool for influencing attitudes, desired social distance, and empathy has had varied results (Ando and more, 2011). Ando and colleagues (2011) found the use of auditory hallucinations yielded contradictory results for empathy and desired social distance, as well as inconsistencies regarding attitudes towards people with schizophrenia. Across the ten studies analyzed, empathy towards people with schizophrenia increased in tandem with desired social distance. Participant feedback suggests the use of auditory hallucinations incur some physical and emotional distress, which may influence desired social distance (Ando, 2011).

One final intervention approach is to have participants watch videos or public service announcements about the stigma of mental health or schizophrenia. A potential benefit to public service announcement interventions is that they can be both educational in nature but also emotionally charged (Corrigan & Kosyluk, 2013; Randolph & Viswanath, 2004). Although public service announcements may elicit strong reactions from their audience (Corrigan & Kosyluk, 2013), research also finds that the positive impacts of these interventions may be short-lived (Nixon, Mansfield, & Thoms, 2008).

Across the three main types of interventions (i.e., educational, interactive, and observational), it is unclear what types of factors are important to create immediate and even longer-lasting change in attitudes. It is also unclear what factors help increase perspective taking or empathetic concern towards individuals with schizophrenia. It appears that an interactive computer-assistive learning environment is more effective at reducing stereotypes towards individuals with schizophrenia over time than reading articles (Finkelstein, et al., 2007). More immersive interactive experiences appear to be

immediately effective in increasing empathy towards individuals with schizophrenia (Skoy et al., 2016; Chaffin & Adams, 2013). However, it is unclear how long-lasting these effects really are, if these interventions will work for those not already in the healthcare system, or what features of the experience had the biggest impact on those changes. Finally, observational interventions, like public service announcements, can tap into attitudes and feelings, and they also have the benefit of reaching a wider audience because they can utilize different dissemination formats like television and radio (Corrigan, 2013). However, some research also finds that while public service announcements are immediately effective, those effects do not last over time (Nixon, et al., 2008).

### **Current Study**

Overall, the literature shows consistent stigmatization towards individuals with mental health issues, especially those with schizophrenia. The stigmatization that individuals with schizophrenia experience have negative ramifications on quality of life and personal experiences. To combat this, some work has been conducted to help reduce the stigma towards mental health, including schizophrenia. This work has focused on three main types of interventions: education-based, interactive, and observational. However, this work has not investigated which features of an intervention are most effective at attitude change or increasing empathy.

Therefore, in the current study, we wanted to better understand what features of an intervention were most likely to influence attitudes, perspective taking, and empathy towards individuals with schizophrenia. Since research shows at least immediate effectiveness with interactive and observational interventions (Chaffin & Adams, 2013; Corrigan, 2013; Skoy, et al., 2016), we wanted to develop an observational intervention

that incorporated some interactive components to it. Furthermore, we wanted to better understand which features of the intervention were most effective in influencing attitudes, perspective taking, and empathy towards individuals with schizophrenia.

In other words, this study investigates what makes an intervention effective in reducing stigma and increasing perspective taking and empathy towards individuals with schizophrenia.

More specifically, we created an observational intervention where participants viewed a person completing everyday tasks while listening to auditory hallucinations, a common symptom of schizophrenia (adapted from Chaffin & Adams, 2013 and Skoy, et al., 2016). In effort to decrease common adverse reactivity to experiencing auditory hallucinations, we used findings from Ando and colleagues (2011) to adapt our study; rather than personally experiencing simulated auditory hallucinations while completing tasks, participants instead virtually observed someone experiencing the simulation. We manipulated how interactive the experience was by either having the participants listen to the auditory hallucinations as they watched or not. In addition, we wondered whether knowing how the person felt as they completed the tasks mattered in how effective this observational intervention was, so we manipulated whether participants saw the reactions or not. Thus, there were three possible intervention conditions: 1) participants viewed someone completing everyday tasks knowing they were listening to auditory hallucinations but not hearing them (control condition), 2) participants viewed someone completing everyday tasks and also got to hear the auditory hallucinations (hallucinations only condition), or 3) participants viewed someone completing everyday tasks as they also

heard the auditory hallucinations and watched additional footage of the person react to their experience in each task (hallucinations and reactions condition).

Based on past research, we predict that the more interactive conditions (where the participant can also hear the auditory hallucinations) will be more effective at reducing stereotypes and increasing perspective taking and empathy towards individuals with schizophrenia than the control condition (Hypothesis 1). We also predict that both the interactive experience along with the understanding of how the experience felt for the person engaged in it will be the most effective at reducing stereotypes and increasing perspective taking and empathy towards individuals with schizophrenia (Hypothesis 2). In sum, we aim to better understand the factors that make observational interventions effective in reducing stigma and increasing perspective taking and empathy.

## Methods

### Participants

The sample was composed of 123 people randomly assigned to one of three conditions (control condition = 42, hallucinations only = 43, hallucinations and reactions = 38). We collected a variety of demographic data. Our sample was split almost evenly by gender (male=65, female=58) and ages ranged from 18-74. Most participants were white (n=93), had a bachelor's degree (n=56), were currently not in school (n=105), and were participating through Mturk (n=110). Data was also collected on the degree to which participants had experience with schizophrenia or other debilitating mental illnesses. The results of this analysis indicated that our participants uniformly had little to no direct familiarity with schizophrenia or other mental illnesses, and were primarily informed about schizophrenia through media outlets (n=78). See Table 10 for general demographic data and Table 9 for mental health demographic summary.

### Design and Materials

This experiment utilized a one-way between-participants design. It was hypothesized that the conditions in which the auditory hallucinations and/or the actor's reactions were heard would be more influential than the control. The program used to run the experiment was Inquisit 5. Participants were drawn from Amazon's Mechanical Turk and Worcester Polytechnic Institute's SONA Systems account.

### *Auditory Hallucination Simulation*

The simulation used in this experiment was developed by clinical psychologist Pat Deegan, who was diagnosed with schizophrenia. It was designed to help those who do not experience auditory hallucinations understand the challenges of those who experience

psychosis. This simulation has been used in evidence-based research to decrease stigma and stereotypic beliefs and increase empathy (Deegan, 2019).

### ***Intervention Independent Variable***

Individuals participated in a study session during which they were randomly assigned to one of the three conditions. One-third of the participants were assigned to the “hallucination only” condition where they watched videos of an actor trying to complete a set of everyday tasks while listening to a simulation of auditory hallucinations. The simulation which the actor was listening to was played in the background of these videos so the participant could hear them as well. Another third of the participants were assigned to a “hallucinations and reactions condition” which contained the same videos of the actor along with videos in which the actor described his thoughts, feelings, and physical reactions at the end of each task. The auditory hallucination simulation was only audible to participants for the videos in which the actor performed tasks and not during the reaction videos. The reactions of the actor were unscripted so as to produce a natural reaction. The final third of participants were assigned to a control condition which contained the videos of the actor completing the tasks but did not have the auditory hallucinations in the background or the reaction from the actor.

### ***Everyday Tasks***

The series of tasks that the actor completed were adapted from Skoy and colleagues (2016). We modified the context of the tasks to suit the current study and be more relevant to our target demographic of college students. The actor was informed that if he completed the task early, then he was to wait patiently until time was up (Skoy et al., 2016). At the end

of each task, the actor was asked to describe their thoughts, feelings, and physical reactions surrounding the activity he just completed while experiencing auditory hallucinations.

**Task 1: Listening to Instructions.** We read the actor short descriptions of three medications an individual with schizophrenia may be prescribed at a psychiatric appointment. The descriptions included the name of a drug, the symptom it targets, and the amount of it that needed to be taken. The actor was then quizzed on what he was told.

**Task 2: Sorting Task.** We had the actor fill out a weekly organizer box with faux medications (e.g., tic tacs, skittles, sweet tarts, etc.) based on information that was on the pill bottle for the faux medications for four minutes. The medication information used was the same as the ones used in Task 1.

**Task 3: Waiting.** We made an excuse to leave the room and the actor had to sit on his own for two minutes. This task was included in order to force the actor to listen to the simulation without distraction.

**Task 4: Following Written Instructions.** We provided the actor with instructions on how to fold an origami boat. They were given four minutes to carry out the instructions.

**Task 5: Memory Task.** The actor was shown a slideshow and asked to memorize the letters shown and then repeat back the letters in order. They were then shown another slideshow and asked to memorize the numbers, and were immediately asked to say the current date before reciting the numbers back in order.

**Task 6: Job Interview.** The actor was asked a set of standard questions given at a job interview.

*After Task Questionnaire*

After each section of video or videos, the participant was shown they were given a questionnaire that contained several questions designed to check if participants were properly following the sequence of the experiment. One question required participants to correctly identify the task they just viewed and rate how difficult they perceived the task to be. They were also asked to indicate their opinions about the task.

### ***Implicit Attitude Measure***

Since this experiment seeks to understand how different interventions influence stigma and stereotypical beliefs towards individuals with schizophrenia, we will measure implicit associations towards schizophrenia. For this measure, we will be using an Implicit Association Task (IAT) that measures implicit attitudes towards schizophrenia adapted from a BIAT-SD (Denenny, Bentley, & Schiffman, 2014). In particular, we will be using the Single Category IAT ("About the IAT," n.d.). This word association program is designed to ascertain individuals' subconscious beliefs by how quickly individuals categorize positive or negative words with the concept of schizophrenia (Denenny et al., 2014). In this particular IAT, the positive words will be items such as safe, good, harmless, and calm. The negative words will be items such as dangerous, bad, threatening, and scary. Additionally, items related to schizophrenia will be schizophrenia, hallucinations, delusions, and paranoia. The speed and accuracy in which individuals make different categorizations will indicate their implicit associations.

### ***Stereotypes and Social Distancing Scale***

We also used a measure for explicit (or conscious) beliefs and expected behavior. We did this using the Stereotypes and Social Distancing (SSD) scale adapted from Schulze and colleagues (2003) which measures conscious attitudes and expected behavior towards

individuals with schizophrenia using a 5-point Likert-type scale (strongly agree to strongly disagree). It contained nineteen items: seven items about stereotypic beliefs (e.g. Someone who has had schizophrenia cannot be helped by the doctors), and the remaining twelve items about behavior and social distance (e.g. If the person sitting next to me in class developed schizophrenia, I would rather sit somewhere else).

### ***Semantic Differential Scale***

Semantic differential scales are often used as measures of intergroup attitude (Wright et al., 1997), and a seven-item one with scores ranging from one to seven was used in this study to provide an evaluation of participant's positive or negative attitude towards individuals with schizophrenia. Higher scores indicate more positive attitudes towards individuals with schizophrenia. This scale was adapted from Wright and colleagues (1997).

### ***Interpersonal Reactivity Index***

The IRI is a widely used measure which assesses a person's inherent emotional and cognitive empathy (*Interpersonal Reactivity Index (IRI)*, n.d.). The emotional empathy subscale is composed of 14 questions and assesses how much participants feel the emotional experience of another person. The cognitive empathy subscale is also composed of 14 questions but assesses how well participants understand the emotional experience of another person. The original scale divides the emotional empathy questions equally into the categories of empathic concern and personal distress, and the cognitive empathy questions into the categories of fantasy and perspective taking. For the purposes of this study only the empathic concern and perspective taking categories were used from each subscale, amounting to a total of 14 questions. The empathic concern subscale assessed participant's tendency to experience feelings of sympathy and compassion for individuals

with schizophrenia. The perspective taking subscale assessed participant's tendency to take the perspective of individuals with schizophrenia in everyday life unprompted. The IRI is scored on a five point Likert-type scale.

### ***Batson Empathic Concern Scale***

This scale is a popularly used measure for assessing how much participants experience certain affective states associated with empathy towards a particular group of people (Batson et al., 1997). Participants are asked to describe how much they feel each of the six adjectives-items (sympathetic, compassionate, soft-hearted, warm, tender, moved) towards that group of people on a seven-point Likert-type scale (for this study it was adapted to be a five-point, ranging from "not at all" to "very much"). Higher scores on this scale mean greater empathy towards individuals with schizophrenia.

### ***Perspective Taking Measures***

We designed our own perspective taking measure for this study, it contained ten items and was scored as a seven-point Likert-type scale.

### ***Manipulation Checks***

A manipulation check questionnaire was included to check the effectiveness of deceptions in the experiment. They were used as grounds for participant removal.

## **Procedure**

### ***Introduction***

Participants were instructed to read an informed consent document to inform them of the nature of this study. In order to participate in the experiment, they were required to agree that they understood what the document conveyed and were ready and willing to

participate. If they said no the experiment ended and they were not able to continue. We also gave participants a cover story so they could better comprehend the activity. The cover story conveyed the fact that they were going to be hearing auditory hallucinations and be asked to answer some questions. Before they could proceed to the experiment they were asked if they had been diagnosed with schizophrenia in the past. If they said no, they were told that they were not eligible, and the experiment ended. If they said yes, they could continue.

### ***Experiment Session and Measures***

Participants were randomly assigned to one of three conditions: “hallucinations only”, “hallucinations and reactions”, or the control. At the end of every video, they were given the post-task questionnaire. After they had finished all of the videos, participants completed our various measures designed to assess their attitudes and empathy towards individuals with schizophrenia. Demographic questions such as age, race/ethnicity, gender were asked. In addition, participants were asked if they or someone close to them is neurodivergent. Participants were also asked some questions designed to check the effectiveness of the deceptions in the experiment. See Appendix for reference.

### ***Debriefing***

After completing the measures, participants were given a debriefing form which more clearly illustrated the purpose of the study as well as our methods, measures, and predictions. In addition, participants were provided with information on both on-campus and online-based mental health resources and encouraged to reach out should they need support after the experiment.

## **Results**

We predicted that two factors could influence participant's attitudes, perspective taking, and empathy towards individuals with schizophrenia and examined these factors as interactive conditions under two different hypotheses. Our first hypothesis was that exposure to the auditory hallucinations in the simulation would have a greater impact on attitudes, perspective taking, and empathy in comparison to the control. Our second hypothesis was that exposure to the person conducting the tasks' immediate reactions to the simulation in addition to hearing the auditory hallucinations would have a greater influence on attitudes, perspective taking, and empathy in comparison to other conditions. To examine these hypotheses, we conducted a one-way analysis of variance (ANOVA) to examine the effect of the interactive conditions (i.e., hearing auditory hallucinations and hearing the hallucinations as well as reactions to the tasks) on attitudes and empathy towards individuals with schizophrenia.

### **Implicit Attitudes**

#### ***Single Category Implicit Association Test***

In order to examine implicit attitudes towards individuals with schizophrenia, we created a single category IAT (SC-IAT) that measured positive and negative associations towards individuals with schizophrenia (modified from Denenny, et al., 2014). We predicted that individuals who heard the auditory hallucinations as well as the reactions to each task would show the most positive implicit attitudes towards individuals with schizophrenia compared to the other two conditions (i.e., hearing hallucinations and not hearing hallucinations). The results of our one-way analysis on how our conditions affected participants' implicit attitudes towards individuals with schizophrenia was not significant

for either the “no voices and no reaction” condition ( $M = -.42$ ,  $SD = .59$ ), the “voices and no reaction condition” ( $M = -.42$ ,  $SD = .41$ ), or the “voices and reaction” condition ( $M = -.42$ ,  $SD = .50$ );  $F(2,120) = .001$ ,  $p = .999$ ,  $\eta_p^2 = .000$ .

### **Explicit Attitudes**

To measure explicit attitudes towards individuals with schizophrenia, we used three different measures. One measure directly investigated six explicit stereotypes towards individuals with schizophrenia (Schulze, 2003). Another measure had participants indicate how positive or negative their attitudes about individuals with schizophrenia are by using a semantic differential scale (e.g., cold or warm; Wright et al., 1997). Finally, we were interested in the level social distance a person desired when interacting with someone with schizophrenia (Schulze, 2003). For each of these analyses, we again predicted that participants who heard the auditory hallucinations as well as saw the reactions after each task would endorse the most positive explicit attitudes towards individuals with schizophrenia compared to the other two conditions.

### ***Stereotyping Measure***

Participants' endorsement of stereotypes about individuals with schizophrenia was measured (Schulze, 2003). The results of our one-way analysis on how our conditions influenced participants' endorsement of stereotypes about individuals with schizophrenia were not significant for either the “no voices and no reaction” condition ( $M = 2.30$ ,  $SD = .64$ ), the “voices and no reaction condition” ( $M = 2.31$ ,  $SD = .69$ ), or the “voices and reaction” condition ( $M = 2.67$ ,  $SD = .60$ );  $F(2,120) = .141$ ,  $p = .869$ ,  $\eta_p^2 = .002$ .

### ***Semantic Differential Measure***

Participants' feelings towards individuals with schizophrenia were measured (Wright et al., 1997). The results of our one-way analysis on how our conditions affected participants' feelings towards individuals with schizophrenia were not significant for either the "no voices and no reaction" condition ( $M= 3.07, SD=.64$ ), the "voices and no reaction condition" ( $M= 2.95, SD= .51$ ), or the "voices and reaction" condition ( $M= 2.97, SD= .63$ );  $F(2,120) = .438, p = .646, \eta_p^2 = .007$ .

### ***Social Distancing Measure***

Participants' desired social distance from individuals with schizophrenia was measured (Schulze, 2003). The results of our one-way analysis on how our conditions affected participants' desire to socially distance themselves from individuals with schizophrenia were not significant for either the "no voices and no reaction" condition ( $M= 2.39, SD=.91$ ), the "voices and no reaction" condition ( $M= 2.41, SD= .76$ ), or the "voices and reaction" condition ( $M= 2.55, SD= .82$ );  $F(2,120) = .432, p = .650, \eta_p^2 = .007$ .

### ***Perspective Taking***

We were also interested in whether the type of intervention that participants engaged in influenced their likelihood of perspective taking. We looked at someone's natural tendency to engage in perspective taking using the Interpersonal Reactivity Index Perspective Taking Subscale (IRI; Davis, 1980). We also directly investigated participants' likelihood to take the perspective of someone with schizophrenia. Overall, we predicted that participants who heard the hallucinations as well as the reactions would engage in more perspective taking than the other two conditions (i.e., hearing hallucinations or not hearing hallucinations).

### ***General Tendency to Perspective Take***

The perspective taking subscale of the IRI was utilized in order to examine participants' natural tendency to engage in perspective taking (Davis, 1980). This measures an individual's tendency to engage in perspective taking in general; it does not measure perspective taking to any particular person or group. The results of our one-way ANOVA on how our conditions affected participants' natural tendency to perspective take was not significant for either the "no voices and no reaction" condition ( $M = 3.78, SD = .70$ ), the "voices and no reaction condition" ( $M = 3.88, SD = .65$ ), or the "voices and reaction" condition ( $M = 3.63, SD = .80$ );  $F(2,120) = 1.318, p = .272, \eta_p^2 = .021$ .

### ***Perspective Taking with Individuals with Schizophrenia***

We were also interested in whether the type of intervention influenced participants' likelihood to take the perspective of individuals with schizophrenia. The results of our one-way ANOVA on how our conditions affected participants' tendency to perspective take with individuals with schizophrenia was not significant for either the "no voices and no reaction" condition ( $M = 3.12, SD = .92$ ), the "voices and no reaction condition" ( $M = 3.04, SD = .83$ ), or the "voices and reaction" condition ( $M = 3.04, SD = .79$ );  $F(2,120) = .105, p = .900, \eta_p^2 = .002$ .

### **Empathic Concern**

Another factor we were interested in was whether the type of intervention that participants engaged in influenced their likelihood of experiencing empathic concern. We examined someone's natural tendency to engage in empathic concern using the Interpersonal Reactivity Index Empathic Concern Subscale (IRI; Davis, 1980). We also directly investigated participants' likelihood to feel empathy with individuals with schizophrenia adapting Batson's (1997) measure of empathy. Overall, we predicted that

participants who heard the hallucinations as well as the reactions would express more empathy than the other two conditions (i.e., hearing hallucinations or not hearing hallucinations).

### ***Empathic Concern Tendency***

To look at participants' general tendency to have empathic concern, we used the Empathic Concern subscale of the IRI (Davis, 1980). The results of our one-way ANOVA on how our conditions affected participants' general tendency to experience empathic concern were not significant for either the “no voices and no reaction” condition (M= 3.98, SD=.86), the “voices and no reaction condition” (M= 3.93, SD= .98), or the “voices and reaction” condition (M= 3.68, SD= 1.01);  $F(2,120)= 1.089, p=.340, \eta_p^2 = .018$ .

### ***Empathic Concern Towards Individuals with Schizophrenia***

We were additionally interested in whether the type of intervention influenced participants' likelihood to express empathy towards individuals with schizophrenia by adapting Batson's (1997) empathy measure. The results of our one-way ANOVA on how our conditions affected participants' general tendency to experience empathic concern were not significant for either the “no voices and no reaction” condition (M= 3.75, SD=.88), the “voices and no reaction” condition (M= 3.71, SD= 1.03), or the “voices and reaction” condition (M= 3.69, SD= .89);  $F(2,120)= .044, p=.957, \eta_p^2 = .001$ .

### **Does Participant Gender Matter?**

Past research indicates that women tend to express more empathy than men (Christov-Moore et al., 2014). Therefore, we examined whether the participant's gender, as well as the type of intervention, influenced attitudes, perspective taking, and empathy towards individuals with schizophrenia. For this exploratory analysis, we used a two-way

ANOVA to measure attitudes, perspective taking, and empathy based on the participant's gender and the type of intervention they engaged in.

### ***Implicit Attitudes***

We investigated whether the participant's gender, as well as the type of intervention, influenced implicit attitudes towards individuals with schizophrenia. The main effect of the type of intervention was not significant,  $F(2, 116) = 0.06, p = .941, \eta_p^2 = .001$ , two-tailed test. The main effect of participant gender was also not significant,  $F(2, 116) = 0.836, p = .363, \eta_p^2 = .007$ , two-tailed test. In addition, there was no significant interaction between the type of intervention and participant's gender,  $F(2, 116) = 1.75, p = .179, \eta_p^2 = .029$ , two-tailed test. See Table 1 for mean and standard deviation. Overall, these results indicate that neither the participant's gender nor the type of intervention influenced implicit attitudes towards individuals with schizophrenia.

### ***Stereotyping Explicit Attitude Measure***

We also explored whether the participant's gender along with the type of intervention influenced the extent to which participants endorsed stereotypes related to schizophrenia. The main effect of type of intervention was not significant,  $F(2, 116) = 0.18, p = .838, \eta_p^2 = .003$ , two-tailed test. There was also no interaction between the type of intervention and the participant's gender,  $F(2, 116) = 0.44, p = .648, \eta_p^2 = .007$ . However, there was a marginally significant main effect for participant gender,  $F(1, 116) = 3.68, p = .058, \eta_p^2 = .031$ , two-tailed test. Female participants ( $M = 2.20, SD = .61$ ) endorsed fewer stereotypes than male participants ( $M = 2.38, SD = .79$ ). See Table 2 for means and standard deviations.

### ***Semantic Differential Explicit Attitude Measure***

Additionally, we examined if participant's gender and the type of intervention influenced feelings towards individuals with schizophrenia. The main effect of the type of intervention was not significant,  $F(2, 116) = .761, p = .470, \eta_p^2 = .013$ . Likewise, the interaction between the type of intervention and the participant's gender was not significant,  $F(2, 116) = 1.84, p = .163, \eta_p^2 = .059$ . However, there was a main effect for participant gender,  $F(2, 116) = 7.33, p = .008, \eta_p^2 = .030$ . Female participants ( $M = 3.14, SD = .50$ ) typically felt more positively towards individuals with schizophrenia than male participants ( $M = 2.87, SD = .65$ ). See Table 3 for means and standard deviations.

### ***Social Distancing Explicit Attitude Measure***

We wondered whether the participant's gender and the type of intervention would influence the amount of social distancing that participant's preferred from individuals with schizophrenia. The main effect of type of interaction was not significant,  $F(2, 116) = 0.65, p = .524, \eta_p^2 = .011$ , two-tailed test. The main effect for participant gender was also not significant,  $F(1, 116) = 1.71, p = .193, \eta_p^2 = .015$ , two-tailed test. In addition, the interaction between type of intervention and participant gender did not have a significant influence on desired social distance  $F(2, 116) = 1.48, p = .231, \eta_p^2 = .025$ , two-tailed test. See Table 4 for means and standard deviation. These results indicate that neither the participant's gender nor the type of intervention influenced the desire to socially distance from individuals with schizophrenia.

### ***Perspective Taking Tendency***

We examined whether participant gender as well as the type of intervention influenced responses on the IRI's Perspective Taking Subscale (Davis, 1980). The main effect for the type of intervention was not significant,  $F(2, 116) = 1.335, p = .267, \eta_p^2 = .022$ .

The main effect for participant's gender was also not significant,  $F(2, 116) = .502, p = .480, \eta_p^2 = .005$ . There was also no interaction between the type of intervention and the participant's gender,  $F(2, 116) = .234, p = .791, \eta_p^2 = .005$ . See Table 5 for mean and standard deviation.

### ***Perspective Taking with Individuals with Schizophrenia***

Likewise, we explored whether participant gender and the type of intervention influenced the motivation to perspective taking with an individual with schizophrenia. The main effect for the type of intervention was not significant,  $F(2, 116) = .211, p = .810, \eta_p^2 = .004$ . The interaction between the type of intervention and the participant's gender was not significant,  $F(2, 116) = .831, p = .438, \eta_p^2 = .039$ . However, there was a main effect of participant gender,  $F(2, 116) = 4.928, p = .028, \eta_p^2 = .013$ . Female participants ( $M = 3.24, SD = .77$ ) were more likely to take the perspective of individuals with schizophrenia than male participants ( $M = 2.90, SD = .88$ ). See Table 6 for mean and standard deviation.

### ***Empathic Concern Tendency***

We also examined whether participant gender as well as the type of intervention influenced responses on the IRI's Empathic Concern Subscale (Davis, 1980). The main effect for the type of intervention was not significant,  $F(2, 116) = 1.326, p = .270, \eta_p^2 = .021$ , neither was the interaction between the type of intervention and participant gender,  $F(2, 116) = .626, p = .536, \eta_p^2 = .012$ . However, there was a main effect for participant gender,  $F(2, 116) = 5.878, p = .017, \eta_p^2 = .050$ . Female participants ( $M = 4.10, SD = .93$ ) were more likely to experience empathic concern than male participants ( $M = 3.68, SD = .93$ ). See Table 7 for mean and standard deviation.

### ***Empathy Towards Individuals with Schizophrenia***

Finally, we explored whether participant gender and the type of intervention influenced the amount of empathy felt towards individuals with schizophrenia (Batson, 1997). The main effect for the type of intervention was not significant,  $F(2, 116) = .182, p = .834, \eta_p^2 = .003$  nor was there an interaction between the type of interaction and the participant's gender,  $F(2, 116) = 1.346, p = .264, \eta_p^2 = .023$ . However, as with empathic concern, there was a main effect for participant gender  $F(2, 116) = 4.024, p = .047, \eta_p^2 = .034$ . Female participants ( $M = 3.91, SD = .89$ ) were more likely to express empathy towards individuals with schizophrenia than male participants ( $M = 3.56, SD = .95$ ). See Table 8 for means and standard deviation.

### **Conclusion**

Overall, one-way ANOVA on how our intervention conditions affected participants' attitudes and empathy towards individuals with schizophrenia proved insignificant in every case, failing to support our hypotheses. Two-way ANOVA revealed gender to be the only factor measured in our data which had a significant impact on participant's attitudes and empathy towards individuals with schizophrenia. Generally, it was found that female participants had less stigmatic attitudes and greater perspective taking and empathic concern towards individuals with schizophrenia.

### **Discussion**

Overall, we aimed to better understand what features of an intervention were most likely to influence attitudes, perspective taking, and empathy towards individuals with schizophrenia. We predicted that the more interactive conditions (where the participant could also hear the auditory hallucinations) would be more effective at reducing stereotypes and increasing perspective taking and empathy towards individuals with

schizophrenia than the control condition (Hypothesis 1). We also predicted that both the interactive experience along with the understanding of how the experience felt for the person engaged in it would be the most effective at reducing stereotypes and increasing perspective taking and empathy towards individuals with schizophrenia (Hypothesis 2).

Our results do not support our first hypothesis. Participants in the more interactive conditions (e.g., heard the auditory hallucinations) did not express more positive attitudes towards individuals with schizophrenia than the control condition. Furthermore, the more interactive interventions (e.g., heard the auditory hallucinations) did not result in a greater likelihood to engage in perspective taking or experience more empathy towards individuals with schizophrenia compared to the less interactive control condition.

Our results also do not support our second hypothesis. Participants in interactive conditions that were also exposed to the taped reactions of the person in the simulation did not exhibit more positive implicit or explicit attitudes towards individuals with schizophrenia than those in the other conditions. In addition, participants who heard the distressing voices and were exposed to the actor's reactions did not show increased perspective taking or empathy towards individuals with schizophrenia than the other conditions.

These findings are inconsistent with past work that examined the use of simulatory interventions in which participants were exposed to auditory hallucinations to increase empathy towards individuals with schizophrenia (Skoy et al., 2016; Chaffin & Adams, 2013). Additionally, attitudes towards individuals with schizophrenia were inconsistent with results from Finkelstein, Lapshin, and Wasserman (2007). Prior research has shown successes in PSAs and other interventions that involve observation (Corrigan & Kosyluk,

2013; Randolph & Viswanath, 2004); however, this observational intervention yielded insignificant results. Schizophrenia simulation tools have shown varied success (Dalky, 2012) depending on their context. Though we did not see significant differences based on condition, our study provides important insight for the implementation of future interventions designed to impact attitudes, perspective taking, and empathy towards individuals with schizophrenia. The present study uncovers the results of an adaption of previously successful simulation interventions (Skoy et al., 2016; Chaffin & Adams, 2013) in combination with adapting strategies from other successful interventions (Finkelstein, Lapshin, & Wasserman, 2007; Corrigan & Kosyluk, 2013; Randolph & Viswanath, 2004).

Although our findings were inconsistent with previous research, another goal was to design a virtual intervention. Several of the research studies that explored stigma interventions use college students or people who live near a college for participants, as is commonplace for university-funded lab-based research. Additionally, much of the previous research targets a specific group. For example, Skoy (2016) and Chaffin and Adams (2013) focused on health care providers that may work directly with psychiatric patients later in their career. Though their promising findings showed a positive change in empathy, we cannot ascertain if this same intervention would have the same results on a general population.

Because the stigma towards people with schizophrenia is pervasive in society on many levels (van Zelst, 2009), interventions that successfully reduce stigma among anyone regardless of education level or career path are imperative. Additionally, these studies, as well as Finkelstien and colleagues (2007), were lab-based, so they could not be publicly disseminated in an economical fashion. If this were possible for more of the general

populace to have access and exposure to successful stigma and empathy interventions, it would provide the necessary catalyst for a positive cultural shift towards individuals with schizophrenia.

Contrary to our predictions, we found gender was a significant factor in most explicit measures of attitude (stereotype endorsement, positive/negative attitudes), measures of empathic concern and perspective taking towards individuals with schizophrenia. However, gender did not play a significant role in implicit attitudes, desire for social distance, and general tendencies to take the perspective of others. It is notable that gender was significant for all of the emotionally charged self-report measures, but insignificant for implicit attitude measures as well as less emotionally charged self-report measures (e.g., general cognitive empathy through perspective taking, desire for social distance).

Past research indicates that women tend to express more empathy than men (Christov-Moore, 2014). There is strong evidence for gender differences in self-reported empathy questionnaires. However, implicit attitude and physiological measures for empathy, those gender differences disappear (Santamaría-García et al., 2017). A systematic review by Holzinger and colleagues (2012) of gender differences in stigma towards mental illness stated: "In most studies, men and women displayed similar attitudes about mental illness...[and] expressed the same desire for social distance." This is consistent with our findings for desired social distance, implicit attitudes; however, it is inconsistent with our findings for stereotype endorsement and explicit positive/negative attitudes. One study suggests that these differences exist due to varied endorsement of traditional gender roles;

they found that “when adherence to traditional gender roles...was controlled for, gender differences in tolerance of mental illness disappeared,” (Phelan & Basow 2007, p 2881).

### **Limitations and Future Research**

In the current research, we were interested in understanding how the features of an intervention influence attitudes, perspective taking, and empathy towards individuals with schizophrenia. Our results may not have matched our original predictions for differences between conditions; however, the gender of the participant played a more significant role in the reaction to the interventions than previously expected. Future research should continue to examine the role that one’s gender has in the effectiveness of different types of mental illness stigma interventions. To confirm this was solely attributed to gender, future studies should include measures for the endorsement of traditional gender roles as seen in (Phelan & Basow, 2007). There is a possibility that the gender of the person in the video had an unintentional effect, as participants were only exposed to a male actor. Therefore, future iterations of this project should also compare female and male video subjects.

In addition, there are a number of different types of interventions that exist, whether they are more educational in form (Finkelstein et al., 2007), interactive in nature (Skoy et al., 2016; Chaffin & Adams, 2013), or more observational in nature (Corrigan & Kosyluk). In the current research, we focused on observational interventions. However, future research should look more closely at all types of interventions. In fact, we initially designed an in-person interactive intervention that was modeled very closely after Skoy and colleagues (2016) and Chaffin and Adams (2013). Therefore, in the original design, participants would either: a) engage in everyday tasks while listening to auditory hallucinations and provide reactions towards their experience, b) watch another person

experience the intervention and hear the auditory hallucinations, or c) complete the tasks without listening to the auditory hallucinations. We sought to better understand how an in-person interactive intervention compared to a more observational intervention. However, due to COVID-19, we were unable to execute this design, and we had to redesign the study to be completely observational in nature. Therefore, future research should investigate whether the type of intervention (e.g., educational, interactive, or observational) matters and how effective these different types of interventions are compared to one another.

Another area of future exploration is with the tasks themselves to see if they play a role in how effective a stigma reduction intervention is, especially for mental health stigmas. In the current work, we emulated the tasks used in past work (Skoy et al., 2016; Chaffin & Adams, 2013). These tasks were related to everyday tasks than an individual with schizophrenia may need to do on their own (e.g., sort medication, follow instructions, remember items in a list, go on a job interview), or when they interact with a healthcare professional (e.g., remember the names of their medications, or wait for someone to see them). It is possible some of these tasks may be more or less effective in influencing someone's attitudes, motivation to perspective take or empathize. Therefore, future studies could explore different types of tasks that may be difficult for those experiencing auditory hallucinations, such as holding conversations, completing transactions, performing tasks that require critical thinking, or being in the public with others and distractions.

One final limitation of the current research is that we were only able to measure attitudes, empathy, and perspective taking immediately after the intervention ended. Therefore, we cannot ascertain how long-lasting any effects are on those who experienced

different interventions. Therefore, future research should investigate both short and long term effects on interventions to reduce mental health stigma.

## **Conclusion**

In summary, the importance of reducing the stigma and increasing perspective taking and empathy towards individuals with schizophrenia remains a pervasive issue (van Zelst, 2009) that current research has been tackling in novel ways (Skoy et al., 2016; Chaffin & Adams, 2013; Finkelstein et al., 2007). Our study used a virtual platform in order to reach a nationwide population varying in socioeconomic status, age, and education level. We combined aspects of the aforementioned studies in an effort to test the effects of an observational intervention on attitudes, perspective taking, and empathy towards people with schizophrenia. Contrary to our hypotheses, gender (rather than experimental condition) had a significant influence on stereotype endorsement, positive attitudes, perspective taking, and empathy towards individuals with schizophrenia.

Research should continue to expand upon the analysis of simulatory interventions, and how different applications may mirror successes of similar anti-stigma and pro-empathy and perspective taking interventions (Skoy et al., 2016; Chaffin & Adams, 2013; Finkelstein et al., 2007). Though the present study did not replicate these findings, it is possible that the incorporation of other features, such as having participants engage in interactive simulations or exposure to educational material would yield changes in stigma similar to those documented through other studies. Importantly, our study added to this body of literature, highlighting that gender may be an additional factor for consideration when designing stigma reducing interventions. Future research may expand on this, designing and testing interventions specifically targeted for different genders.

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## Tables and Figures

**Table 1**

*Single Category IAT Means and Standard Deviations for Condition and Gender*

<b>Conditions</b>	<b>Gender</b>	<b>M</b>	<b>SD</b>	<b>N</b>
No Voices and No Reaction	Female	-.56	.55	18
	Male	-.33	.61	23
	Total	-.43	.59	41
Voices and No Reaction	Female	-.51	.43	23
	Male	-.32	.36	20
	Total	-.42	.41	43
Voices and Reaction	Female	-.33	.50	17
	Male	-.49	.52	21
	Total	-.42	.51	38
Total	Female	-.47	.49	58
	Male	-.38	.51	64
	Total	-.42	.50	122

\*Scores closer to one indicate stronger attitudes. Negative scores indicate negative implicit attitudes towards people with schizophrenia.

**Table 2**

*Stereotypes Scale Means and Standard Deviations for Condition and Gender*

<b>Conditions</b>	<b>Gender</b>	<b>M</b>	<b>SD</b>	<b>N</b>
No Voices and No Reaction	Female	2.08	.62	18
	Male	2.46	.63	23
	Total	2.30	.64	41
Voices and No Reaction	Female	2.24	.61	23
	Male	2.38	.79	20
	Total	2.31	.69	43
Voices and Reaction	Female	2.28	.55	17
	Male	2.44	.65	21
	Total	2.37	.60	38
Total	Female	2.20	.59	58
	Male	2.42	.68	64
	Total	2.32	.65	122

\*Higher scores indicate stronger endorsement of stereotypes towards people with schizophrenia.

**Table 3**

*Semantic Differential Scale Means and Standard Deviations for Condition and Gender*

<b>Conditions</b>	<b>Gender (Participant)</b>	<b>M</b>	<b>SD</b>	<b>N</b>
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No Voices and No Reaction	Female	3.35	.43	18
	Male	2.86	.71	23
	Total	3.07	.65	41
Voices and No Reaction	Female	2.96	.43	23
	Male	2.94	.61	20
	Total	2.95	.51	43
Voices and Reaction	Female	3.16	.59	17
	Male	2.83	.63	21
	Total	2.97	.63	38
Total	Female	3.14	.50	58
	Male	2.87	.65	64
	Total	3.00	.59	122

\*Higher scores indicate more positive attitudes towards people with schizophrenia.

**Table 4**

*Social Distancing Scale Means and Standard Deviations for Condition and Gender*

<b>Conditions</b>	<b>Gender</b>	<b>M</b>	<b>SD</b>	<b>N</b>
No Voices and No Reaction	Female	2.06	.73	18
	Male	2.61	.97	23

	Total	2.37	.91	41
Voices and No Reaction	Female	2.43	.63	23
	Male	2.38	.91	20
	Total	2.41	.76	43
Voices and Reaction	Female	2.50	.92	17
	Male	2.59	.75	21
	Total	2.55	.82	38
Total	Female	2.34	.76	58
	Male	2.53	.88	64
	Total	2.44	.83	122

\*Higher scores indicate greater desired social distance from people with schizophrenia.

**Table 5**

*Modified Perspective Taking Subscale of IRI Means and Standard Deviations for Condition Type and Gender*

Conditions	Gender	Mean	Std. Deviation	N
No Voices and No Reaction	Female	3.91	.70	18
	Male	3.71	.69	23
	Total	3.80	.69	41

Voices and No Reaction	Female	3.93	.62	23
	Male	3.83	.69	20
	Total	3.88	.65	43
Voices and Reaction	Female	3.61	1.04	17
	Male	3.64	.57	21
	Total	3.63	.80	38
Total	Female	3.83	.78	58
	Male	3.72	.64	64
	Total	3.78	.71	122

\*Higher scores mean more willingness to take the perspective of others.

**Table 6**

*Perspective Taking Means and Standard Deviations for Condition Type and Gender*

<b>Conditions</b>	<b>Gender</b>	<b>M</b>	<b>SD</b>	<b>N</b>
No Voices and No Reaction	Female	3.45	.63	18
	Male	2.84	1.05	23
	Total	3.11	.93	41
Voices and No Reaction	Female	3.12	.78	23

	Male	2.95	.90	20
	Total	3.04	.83	43
Voices and Reaction	Female	3.18	.90	17
	Male	2.94	.69	21
	Total	3.04	.79	38
Total	Female	3.24	.77	58
	Male	2.90	.88	64
	Total	3.06	.85	122

\*Higher scores mean more willingness to take the perspective of people with schizophrenia.

**Table 7**

*Modified Empathic Concern Subscale of IRI Means and Standard Deviations for Condition Type and Gender*

<b>Condition</b>	<b>Gender</b>	<b>M</b>	<b>SD</b>	<b>N</b>
No Voices and No Reaction	Female	4.36	.74	18
	Male	3.71	.86	23
	Total	3.99	.86	41
Voices and No Reaction	Female	4.12	.89	23

	Male	3.71	1.05	20
	Total	3.93	.98	43
Voices and Reaction	Female	3.78	1.11	17
	Male	3.61	.93	21
	Total	3.68	1.01	38
Total	Female	4.10	.93	58
	Male	3.68	.93	64
	Total	3.88	.95	122

\*Higher scores mean more empathetic concern.

**Table 8**

*Batson Empathic Concern Scale Means and Standard Deviations for Condition Type and Gender*

<b>Conditions</b>	<b>Gender</b>	<b>M</b>	<b>SD</b>	<b>N</b>
No Voices and No Reaction	Female	4.11	.67	18
	Male	3.49	.96	23
	Total	3.76	.89	41
Voices and No Reaction	Female	3.92	.93	23
	Male	3.48	1.10	20

	Total	3.71	1.02	43
Voices and Reaction	Female	3.67	1.03	17
	Male	3.71	.79	21
	Total	3.69	.89	38
Total	Female	3.91	.89	58
	Male	3.56	.95	64
	Total	3.72	.93	122

\*Higher numbers mean more empathy towards people with schizophrenia.

**Table 9**

*Mental Health History Demographic Data*

<b>Variable</b>	<b>Categories</b>	<b>Overall (N = 123)</b>
Do you have a long-lasting or chronic condition that substantially limits one or more of your major life activities?	Yes No Prefer not to answer	8.1% 89.4% 2.4%
Does anyone close to you have a long-lasting or chronic condition that substantially limits one or more of their major life activities?	Yes No Prefer not to answer	17.9% 78.9% 3.2%
I have a relative or close family friend who has schizophrenia.	Yes No Prefer not to answer	10.6% 87.0% 2.4%
I currently (or have in the past) work with someone who has schizophrenia.	Yes No Prefer not to	6.5% 90.2% 3.3%

	answer	
Prior to today, my only information about schizophrenia has been from a TV show, Movie, or something I read.	Yes No Prefer not to answer	63.4% 34.1% 2.4%
I have never had any contact with a person that I was aware had schizophrenia.	Yes No Prefer not to answer	61.0% 35.8% 3.2%

## Appendix

### Attitude, Perspective Taking, and Empathy Survey

#### IAT

Focal concept and attribute words:

-schizophrenia (*schizophrenia, hallucinations, delusions, and paranoia*)

-safe (*safe, good, harmless, calm*)

-dangerous (*dangerous, bad, threatening, scary*)

#### Stereotypes Scale

Someone who has had schizophrenia cannot cope with stress before exams.

1	2	3	4	5
Strongly disagree			Strongly agree	

Mostly, someone who has had schizophrenia comes from a family with little money.

1	2	3	4	5
Strongly disagree			Strongly agree	

Someone who has had schizophrenia cannot be helped by others.

1	2	3	4	5
Strongly disagree			Strongly agree	

When meeting someone with schizophrenia, one should better watch out.

1	2	3	4	5
Strongly disagree			Strongly agree	

Someone who has had schizophrenia blows their top for the slightest reason.

1	2	3	4	5
Strongly disagree			Strongly agree	

Someone who has had schizophrenia is particularly good at music or art.

1	2	3	4	5
Strongly disagree			Strongly agree	

#### Social Distance Scale

I would be afraid to talk to someone who has had schizophrenia.

1	2	3	4	5
Strongly disagree			Strongly agree	

I would not be upset or disturbed to be in the same class as someone who has had schizophrenia.

1	2	3	4	5
Strongly disagree			Strongly agree	

I could imagine making friends with someone who has had schizophrenia.

1	2	3	4	5
Strongly disagree			Strongly agree	





1	2	3	4	5
Does not describe me well			Describes me well	

### Batson Empathy Scale

How sympathetic do you feel towards individuals with schizophrenia?

1	2	3	4	5
not at all			very much	

How compassionate do you feel towards individuals with schizophrenia?

1	2	3	4	5
not at all			very much	

How soft-hearted do you feel towards individuals with schizophrenia?

1	2	3	4	5
not at all			very much	

How warm do you feel towards individuals with schizophrenia?

1	2	3	4	5
not at all			very much	

How tender do you feel towards individuals with schizophrenia?

1	2	3	4	5
not at all			very much	

How moved do you feel towards individuals with schizophrenia?

1	2	3	4	5
not at all			very much	

### Perspective Taking Scale

How likeable does a person with schizophrenia seem?

1	2	3	4	5
not at all			very much	

How motivated would you be to get along with a person with schizophrenia?

1	2	3	4	5
not at all			very much	

To what extent do you feel that you and a person with schizophrenia have things in common?

1	2	3	4	5
not at all			very much	

How motivated are you to put yourself in the shoes of a person with schizophrenia?

1	2	3	4	5
not at all			very much	

To what extent do you think you could see the world through the eyes of a person with schizophrenia?

1	2	3	4	5
not at all			very much	

How easily do you think you could take the perspective of a person with schizophrenia?

1	2	3	4	5
not at all			very much	

To what extent do you think you could understand the standpoint of a person with schizophrenia?

1	2	3	4	5
not at all			very much	

### Semantic Differential Scale

On the next pages, you will see a series of trait pairs. Please indicate how you feel about individuals with schizophrenia for each of the trait pairings.

I feel that individuals with schizophrenia are:

- |                 |   |   |   |   |   |               |
|-----------------|---|---|---|---|---|---------------|
| 1. (Cold)       | 1 | 2 | 3 | 4 | 5 | (Warm)        |
| 2. (Negative)   | 1 | 2 | 3 | 4 | 5 | (Positive)    |
| 3. (Hostile)    | 1 | 2 | 3 | 4 | 5 | (Friendly)    |
| 4. (Suspicious) | 1 | 2 | 3 | 4 | 5 | (Trustworthy) |
| 5. (Contempt)   | 1 | 2 | 3 | 4 | 5 | (Respect)     |
| 6. (Disgusting) | 1 | 2 | 3 | 4 | 5 | (Admired)     |

### After Task Measure

1. What activity did the person in the video just try to complete?"
  - a. "Remember medicine prescriptions",
  - b. "Sort candy "medicine" into an organizer",
  - c. "Wait",
  - d. "Fold a paper boat",
  - e. "Remember a list of numbers and letters",
  - f. "Respond to interview questions",
  - g. "Tell a story about their favorite vacation",
  - h. "Fill out a crossword",
2. How difficult did the task appear to be in this station?
  - a. [5-point Likert-type from "not at all" to "very difficult"]
3. What are your reactions after watching the person complete this task?
  - a. [Open textbox for participant response below]

### Manipulation Check

1. During this session:
  - a. "I watched someone complete a series of tasks.",
  - b. "I watched someone complete a series of tasks while hearing auditory hallucinations.",
  - c. "I watched someone complete a series of tasks while hearing auditory hallucinations and learned their reactions.",
  - d. "I did none of these things."
2. Open Ended
  - a. What do you think the purpose of this experiment was?
  - b. Did anything in the study strike you as odd or unusual?

- c. Did your beliefs or suspicions change your responses in any way?
- 3. CAPCHA: "Please tell us what you see in the picture." [Image of a tree]
  - a. "Robot"
  - b. "Beach"
  - c. "Tree"
  - d. "Animals"