Disclosure and Invisible Illnesses: Effects on the Attribution Process

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Abstract

This study explored the role of disclosure in the attribution process when disclosing information related to invisible disabilities. More specifically, the present study examined whether verbal and/or nonverbal disclosures of an invisible illness through photos and their related captions influenced the attribution process. This study used a 2x2 experimental design in which participants answered questions about pictures of a person with a specific invisible illness, Chronic Regional Pain Syndrome (CRPS). Participants were exposed to one of four conditions (nonverbal and verbal disclosure, nonverbal disclosure only, verbal disclosure only, or no disclosure) and asked to make attributions about the individual depicted. Locus of control, stability, and controllability were looked at in particular. Results revealed that images with text (nonverbal and verbal disclosure) do not act as a strong enough form of disclosure to greatly affect the attribution process. The results of this study may be used as a stepping stone to study which specific components of a disclosure generate changes in attributions, with the goal of designing an intervention that helps people with invisible disabilities effectively disclose their illness to others. Although this study focused on the effects of Chronic Regional Pain Syndrome, the results may be generalizable to other invisible diseases such as Multiple Sclerosis or migraines.

Key Words: invisible illness, attribution theory, chronic regional pain syndrome, disclosure

Disclosure of Invisible Illnesses: Effects on the Attribution Process

Many illnesses go undetected by the average observer. Such conditions, often called indivisible illnesses or indivisible disabilities (Matthews & Harrington, 2000), may result in incorrect assumptions regarding individuals' behavior. Thus, a central question that arises regarding invisible illnesses is how does knowing about someone's invisible illness impact the attributions made about that person? The goal of the present study is to address this question by investigating verbal and nonverbal disclosures of an invisible illness and subsequent attribution processes. The present study focuses on disclosures involving Complex Regional Pain Syndrome (CRPS), a potentially invisible illness (McClure, 2006; Coderre & Bennet, 2010) and how such disclosures impact the ways others interpret the behaviors of people with CRPS.

Many people make the decision to disclose information based on a perceived benefit of disclosure (Ignatius & Kokkonen, 2007; Such, Espinosa, Garcia-Fornes, & Sierra, 2012;). In the context of invisible illnesses, disclosing that an individual has an invisible illness, such as CRPS, may offer the benefit of altering the target's attributions about the individual. Disclosing an invisible illness may help the targets of the disclosure more accurately understand the motivation behind individuals' behavior and the illness-related reasons that may underlie certain decisions. The purpose of this study is to determine how different forms of disclosure (nonverbal and/or verbal) by a person with an invisible illness impact attributions about locus of control, stability, and controllability. Exploring the attribution process as it relates to invisible illnesses may help individuals with such diseases better navigate the complex process of disclosing such information and expand health communication scholars' understanding of the unique communication processes that occur for individuals with such diseases.

Attribution Theory

Attribution theory explains that people make attributions as a method of uncertainty reduction, making

sense of different behaviors or events, and gaining a sense of control (Eberly, Holley, Johnson, & Mitchell, 2011). There are multiple factors that influence individuals' assessments of a behavior. Thus, an aim of the attribution process is to make predictions about people's behavior, which allows people to gain more confidence about their interpretations of the future and reduce their uncertainty (Eberly et al., 2011; Landridge & Butt, 2004).

Attributions are often conceptualized on a broad level as either being internal or external. Internal attributions are made about behavioral norms. They often coincide with personality traits

such as lazy, boring, strict, or timely. External attributions are most frequently made when the behavior in question is not considered to be the norm. Deviations are often the result of uncontrollable stimuli such as a power outage or the car breaking down (Eberly et al., 2011). Unfortunately, people do not always make appropriate behavioral attributions. For example, the attribution process may be influenced by the perceived motives of the individual whose behavior is being assessed. The fundamental attribution error refers to "the tendency to attribute another person's behavior to their dispositional qualities, rather than situational factors" (Landridge & Butt, 2004, p. 359). In other words, people are more likely to make internal attributions rather than external attributions because people do not always make accurate assumptions about the cause(s) of a behavior (Landridge & Butt, 2004, p. 359). Given the complex nature of attribution processes, the aim of this study is to explore how attributions are affected by disclosure. More specifically, the present study investigates whether revealing that an individual has an invisible illness influences the attribution process.

Invisible Illness and Chronic Regional Pain Syndrome (CRPS)

Invisible illnesses offer a unique context for investigating the attribution process. Matthews and Harrington (2000) explain that "invisible disabilities are not noticed by observers 'except under unusual circumstances or by disclosure from the disabled person or other outside source" (p. 405). Chronic Regional Pain Syndrome (CRPS) is one such condition that would be classified as invisible, as symptoms such as pain are not always apparent to others (Clarke & Iphofen, 2008). Therefore, a form of disclosure (either verbal or nonverbal) is needed in order to make observers aware that a person has CRPS (Esmail, Darry, Walter, & Knupp, 2010).

The literature refers to CRPS as Chronic Regional Pain Syndrome, Chronic Regional Pain Syndrome- Type 1 or 2, Reflexive Sympathetic Dystrophy, and Causalgia. This study will focus on Chronic Regional Pain Syndrome Type 1 and will be referred to as CRPS throughout the remainder of the study. According to Coderre and Bennet (2010), about 26 people out of every 100,000 have been diagnosed with Chronic Regional Pain Syndrome Type 1 (CRPS-1). "Complex regional pain syndrome-type I (CRPS-I; reflex sympathetic dystrophy) is a chronic pain condition that usually follows a deep-tissue injury such as fracture or sprain. The cause of the pain is unknown" (Coderre & Bennett, 2010, p. 1224). It is assumed that since this disease is so rare, few people understand the symptoms and behaviors associated with it.

Scholars (e.g., Hyatt, 2010) have noted both the visible and invisible symptoms that are present in patients with CRPS:

"Complex regional pain syndrome (CRPS) is a chronic condition that usually affects both upper and lower extremities. It consists of various combinations of sensory, autonomic, and motor abnormalities. The main symptom is an intense burning pain. Additional symptoms include hypersensitivity, swelling, alterations in skin characteristics, changes in nail and hair growth, muscle atrophy, and decreased mobility in the affected limb" (Hyatt, 2010, p. 208).

Although some of the symptoms of CRPS can be seen by the public, other symptoms are invisible and cannot be seen. For instance, pain may be depicted by grimacing, crying or limping; however, lack of those cues leads to pain being an invisible symptom.

Patients with CRPS are aware of the invisibility of their disease and have noted the barriers that result from it. Clarke and Iphofen (2008) conducted a study to gain a deeper understanding of chronic pain and how it impacts the people diagnosed with it. Participants consisted of chronic pain patients that have been seeking treatment for at least three years. In the study, many participants referred to their pain as "invisible" or "unseen" (Clarke & Iphofen, 2008, p. 660). Regarding invisible pain, one patient remarked that he "needed the loo while I was out and I find it difficult to wait in the queue, if I looked disabled it would be easier and I could use the disabled toilets, but other people are not aware of the need I feel" (p. 660). This person reflected upon the importance of nonverbal disclosures of pain to gain access to the "disabled toilet." Another patient noted, "I think my appearance deceives people sometimes" (Clark & Iphofen, p. 660). This person recognized that the lack of nonverbal disclosure of his disease leads to inaccurate perceptions of him.

The impact of nonverbal cues of trauma on the attribution of different behaviors associated with brain injuries that are similar to behaviors associated with adolescence has also been explored (McClure, Devlin,

McDowall & Wade, 2006). Pictures of a teenage boy with a head bandage (treatment group) and without a head bandage (control group) were presented to participants who were then asked to explain the cause of certain behaviors based on the pictures as either due to the head injury or normal adolescence. The presence and absence of the head bandage in the picture of the boy can be classified as nonverbal disclosure. As predicted, the presence of a nonverbal disclosure (the head bandage in this case) led to an external attribution (behavior was based on brain injury) whereas the lack of nonverbal disclosure led to an internal attribution (behavior was based on adolescence). Overall, McClure et al. (2006) concluded that "people with a visible disability are judged differently to people who look normal" (p. 1033). Together, the studies detailed above exemplify the importance of nonverbal cues in interpreting behavior. Though such studies have highlighted the importance of nonverbal signs of illness, the aim of the present study is to explore both *verbal* and *nonverbal* disclosures related to CRPS, and thus expand our current understanding of the effects of disclosure on the attribution process.

Disclosure

Self-disclosure is defined by Green, Derlega, and Mathews (2006) as an "interaction between at least two individuals where one intends to deliberately divulge something personal to another" (p. 411). This definition is similar to the definition used in the present study; however, this study is not concerned with the intentionality of the disclosure because nonverbal disclosures may occur without intention. Additionally, third party disclosures will be looked at rather than self-disclosures. This study views disclosure as a type of announcement, confession, admission, divulgence, or explanation of having CRPS. Disclosure may come in the form of verbal and/or nonverbal disclosures. Nonverbal disclosures include, but are not limited to, visible signs of pain or distress such as a bandage/brace, the use of crutches, the use of a wheelchair, tears/crying, pained facial expressions, and limps. Verbal disclosures take place when words are used to explain the pain conditions.

In the present study (and in line with McClure et al., 2006), such disclosures are explored through photos and their captions, as this is a common means of revealing information in the digital age. It is important to understand how individuals make attributions based on photos, as "appearance" has been associated with various attribution processes (Stanley & Standen, 2000). For example, research has shown that when a disabled person appears independent, more internal attributions are made (i.e., the individual is blamed for their behavior), but when the disabled person appears to rely on the help of a caregiver, more external attributions are made. The presence of a caregiver or someone else providing assistance may act as a form of nonverbal disclosure and thus change the invisibility status of the disease.

Unfortunately, some people may perceive different obstacles regarding the disclosure process and therefore may keep their disease to themselves, choosing not to disclose. Booker, Blethyn, Wright, and Greenfield (2006) conducted a focus group among people with Sickle Cell Disease to discuss the impact it has had on their lives. One trend that arose was that the participants felt that it was difficult to convince people (especially doctors) that they were in pain since the participant's perception is that pain cannot be seen. This fear of misunderstanding caused many of the participants to withhold a disclosure of their illness (Booker et al., 2006, p. 46). Thus, verbal disclosures may not be successful if a patient does not believe they can accurately explain themselves and/or if the recipient of the disclosure does not believe the patient. Therefore, it is possible that nonverbal disclosures, or signs of physical pain, may lead to more accurate attributions by onlookers or interactional partners. The present study offers and empirical test of this possibility by investigating the attribution process following verbal and nonverbal disclosures separately, as well as by exploring the outcomes when either both or no forms of disclosure are employed.

CRPS-Related Disclosures and the Attribution Process

While looking at CRPS in the context of attribution theory, it is important to note the three dimensions by which individuals make attributions: locus of control, stability, and controllability (Weiner, 1986; Kelley, 1967; Kelley & Stahelski, 1970).). Locus of control involves the cause of the event. When people assess the locus of control, they are determining whether the event was caused by an individual (i.e., an internal locus of control) or the situation (i.e., an external locus of control) (Wilson, Cruz, Marshall, & Rao, 1993). The second dimension, stability, assesses "whether the cause for an event always is present (stable) or varies over time and context (unstable) " (Wilson et al., 1993, p. 353). Lastly, controllability involves whether an individual has influence over the outcome of the event (controllable) or whether it was beyond their control (i.e., uncontrollable; Wilson et al., 1993).

As it relates to CRPS, people may make differing attributions based on their awareness (or lack of awareness) that an individual suffers from CRPS. For example, people who are unaware that an individual is

avoiding an activity because they have CRPS may perceive the cause of this behavior to be internal (i.e., caused by the individual), when in actuality, the cause of their decision was external (i.e., caused by the symptoms of CRPS). In terms of stability, a person with CRPS may constantly avoid certain activities due to their illness or they may only avoid activities during flair ups. Lastly, people may vary in their assessments of an individuals' control over their condition. For example, though an individual may be aware that a friend has

CRPS, she/he may believe that the individual has more or less control over the pain and the management of their condition.

Taken together, the above research suggests that disclosure of CRPS will allow individuals to make more accurate attributions regarding the target's (i.e., the person in the photo) behavior in terms of the locus of control (or cause of the behavior) and controllability. More specifically, disclosure should result in more external (i.e., caused by the disease) and uncontrollable (i.e., their pain is severe and they cannot change their pain) attributions. However, it is unclear whether stability will be affected, as individuals may either assume that individuals consistently avoid certain activities or they are only avoided during particular times.

Furthermore, this pattern should follow a hierarchy, such that nonverbal disclosures result in more accurate attributions (in line with the above patterns) than verbal disclosures, with the presence of both verbal and nonverbal disclosure being the most successful. Finally, without the disclosure, people may incorrectly attribute CRPS-related behaviors to non-CRPS causes. Given that individuals may choose not to reveal information if they do not have the efficacy to do so (Booker et al., 2006), it is also important to address the potential for no disclosure. Taken together, the following hypotheses are put forth:

H1a: Nonverbal disclosures should be associated with increased external attributions about CRPS related behavior.

H1b: Nonverbal disclosures should be associated with increased uncontrollable attributions about CRPS related behavior.

H2a: Verbal disclosures should be associated with increased external attributions about CRPS related behavior.

H2b: Verbal disclosures should be associated with increased uncontrollable attributions about CRPS related behavior.

RQ1: Are nonverbal disclosures associated with stable attributions about CRPS related behaviors?

RQ2: Are verbal disclosures associated with stable attributions about CRPS related behaviors?

H3a: Out of the four types of disclosure (nonverbal only, verbal only, both, and none), individuals who receive both nonverbal and verbal disclosures will be most likely to make external attributions.

H3b: Out of the four types of disclosure (nonverbal only, verbal only, both, and none), individuals who receive both nonverbal and verbal disclosures will be most likely to make uncontrollable attributions.

RQ 3: Does the attribution of stability vary between conditions?

Method

Participants

A total of 1,009 participants were recruited from Amazon Mechanical Turk's online participant pool, of which 60% were male and 40% were female. Individuals from the United States, from all backgrounds, ethnicities, and social-economic statuses were able to participate. The majority of participants were White/Caucasian (73.1%). Although not equally, other races were represented as well (Black/African American=7.5%; Hispanic / Latino = 6.2%; Asian= 10.5%; American Indian / Native American = .6%; other = 2.2%). All participants were 18 years of age or older and ranged in age from 18-73 (M= 31; SD= 11). When participants clicked on the link to the survey, they were randomly placed into one of four conditions. The variance of demographics between conditions was not significantly different.

Procedure

All eligible participants had access to a link on Qualtrics that brought them to a letter that contained an introduction to the survey, statement of confidentiality, as well as contact information for questions/concerns about the survey. If participants consented to participate (by clicking "agree"), they were directed to the study survey. Participants were asked to complete an online survey that asked questions about a specific image that was presented. Participants were randomly assigned (through the data collection website Qualtrics) to one of four conditions (described below).

Image 1 *Representing a Nonverbal Disclosure*

Image 2 *Representing Lack of a Nonverbal Disclosure*

Similar to the research design used by McClure et al. (2006), participants were shown an image and then asked questions based on that image (see Appendix A). Image 1 simulates a nonverbal disclosure by having the neck brace convey that the target ("Mark") is injured and/or in pain. Individuals assigned to the nonverbal disclosure only condition were exposed to Image 1 and not provided with any additional text. Individuals assigned to the verbal disclosure only condition were given the text: "Mark has a rare pain condition called Chronic Regional Pain Syndrome. The pain can be so excruciating that, at times, he is unable to walk" and exposed to Image 2, which does not imply any pain or illness. Individuals in the verbal and nonverbal disclosure condition were exposed to both Image 1 and the text described above. Lastly, individuals in the no disclosure condition were exposed to Image 2 and no text.

It is important to note that wearing a neck brace is not part of the treatment for CRPS. This option was selected over having a person with obvious physical manifestations of CRPS (edema, atrophied limbs...) pose for picture because this request may have been seen as disrespectful or insensitive and therefore, unethical.

Measurement

Each group was given the following prompt: "This past weekend Mark's friends asked him to play football and he said no. Please respond to the following statements regarding the reasons Mark did not play football." Participants were then asked to respond to items and note their level of agreement using a 5-point Likert Scale. Participants responded to statements that assessed Mark's behavior in terms of locus of control, the stability of his decision not to play football, and the controllability of the situation (i.e., could Make have changed the outcome of the situation?). All statements within the survey were randomized through Qualtrics to increase the construct validity of the survey.

Locus of control (α=.752). Participants were prompted with, "Mark didn't play football because:" and asked to respond to 6 items assessing the locus of control (e.g., "he didn't feel well" (illness-based / external); "it hurts him to engage in physical activity" (illness-based / external); "he doesn't care about physical activity" (personality-based / internal); "he is lazy" (personality-based / internal). Participants responded to these items on a 5-point Likert scale (with 1 being "strongly disagree" and 5 being "strongly agree"). External items were reverse coded so that lower scores reflected external attributions and higher scores reflected internal attributions.

Stability (α=.899). Participants were prompted with, "If you had to guess about Mark's normal behavior, would you say that his decision not to play football this past weekend is..." and asked to respond to 4 items assessing the stability of the behavior (e.g., "in line with his normal behavior" (stable); "a decision he would normally make" (stable); "atypical of how he normally acts" (unstable); "different from how Mark normally behaves" (unstable). Participants responded to these items on a 5-point Likert scale (with 1 being "strongly disagree" and 5 being "strongly agree"). Unstable items were reverse coded so that lower scores reflected unstable attributions and higher scores reflect stable attributions.

Controllability (α=.71). Participants were next asked to respond to 4 items assessing the controllability of the situation (e.g., "There are things Mark could have done to play in the football game" (control); "It was Mark's decision not to play football" (control); "The decision not to play football was beyond Mark's control" (no control); "There was nothing Mark could have done to play football" (no control). Participants responded to these items on a 5-point Likert scale (with 1 being "strongly disagree" and 5 being "strongly agree"). No control items were reverse coded; lower scores reflected uncontrollable attributions and higher scores reflect

controllable attributions.

Results

Hypothesis 1, hypothesis 2, and research questions 1 and 2 were tested using a correlation analysis (see Table 1). Before conducting the correlation analysis, conditions were recomputed so that the nonverbal disclosure group contained participants who received either the nonverbal disclosure only or both the nonverbal and the verbal disclosure. The verbal disclosure group contained participants who received either the verbal disclosure only or both the nonverbal and the verbal disclosure. A new variable was also computed to test for an interaction effect; however, it was not significant.

Hypothesis 1a and 1b predicted that nonverbal disclosures would be associated with increased external and uncontrollable attributions about CRPS related behavior. The correlation analysis revealed that nonverbal disclosures were significantly associated with locus of control (r= .27; p<.001) such that participants who received a nonverbal disclosure were more likely to view Mark as having an internal locus of control. There was also a small correlation between the nonverbal disclosure and controllability (r = .167; p<.01) indicating that Mark was viewed as having more control over his situation. Though significant, both relationships were in the opposite direction than predicted. Hypothesis 1 was not supported.

Hypothesis 2 predicted that verbal disclosures would be associated with increased external and uncontrollable attributions about CRPS related behavior. The correlation analysis revealed only a small negative relationship between verbal disclosures and locus of control (r = -.117, p <.01) and controllability (r =-.051, p<.01), indicating that verbal disclosures are associated with increased external and uncontrollable attributions. Though the correlations were weak, hypothesis 2 was supported.

Research questions 1 and 2 asked whether nonverbal and verbal disclosures would be associated with stable attributions. The analysis revealed that nonverbal disclosures were negatively associated with the perceived level of stability (r = -.269; p<.001). In other words, when a nonverbal disclosure was made, participants felt that Mark usually plays football, but is currently unable to. However, verbal disclosures (research question 2) were positively associated with the perceived level of stability (r = .443; p<.001). In other words, Mark's decision not to play football was perceived as the norm when information about his condition was verbally disclosed.

Hypothesis 3 predicted that of the four types of disclosure (nonverbal only, verbal only, both, and none), individuals who received both nonverbal and verbal disclosures would be most likely to make (a) external and (b) uncontrollable attributions. Research question 3 asked whether stability varied between conditions. Hypothesis 3 and research question 3 were tested using a one-way ANOVA. A one-way ANOVA revealed significant differences across conditions when looking at locus of control (F(3, 996) = 342.506, p<.001), stability (F(3,998) = 66.109, p<.001), and controllability (F(3,995) = 134.202, p<.001; see Table 2). A Bonferroni post-hoc analysis was used to explore how each of these conditions varied by attribution variable (locus of control, stability, and controllability; see Table 3).

behavior being viewed as controllable. In other words, disclosing the illness nonverbally appears to increase the likelihood of people assuming that it was an individual's own decision not to participate in the activity (rather than the result of their invisible illness) and that the individual could have changed their behavior if they wanted. Although the latter may sound counterintuitive, it may be that people thought that the behavior could be changed once the ailment was gone (e.g., the belief that Mark can control whether or not he wants to play football once his injury heals). Future studies should explore this phenomenon with more in depth questions regarding rationale behind attributions.

Conversely, verbal disclosures were associated with greater external and uncontrollable attributions. Contradictory findings for nonverbal and verbal disclosures again arose when investigating the dimension of stability. When a nonverbal disclosure was made, the behavior was viewed as unstable, meaning that the current behavior exhibited (i.e., avoiding the activity) was not the norm, whereas verbal disclosures were associated with the belief that the behavior was the norm. The stability attributed to the behavior may be based on the perceived permanence of the condition. The nonverbal disclosure may not confirm that the illness is permanent, which opens up the possibility for changes in the situation (and thus unstable attributions). The verbal disclosure clarifies the permanence of the invisible illness, and thus the avoidance of the activity may be viewed as a more stable behavior.

The central aim of this study was to understand how knowing about someone's invisible illness impacts the attribution process and test whether certain forms of disclosure are more beneficial than others for individuals with an invisible illness. The findings of this study suggest that verbal disclosures are a more accurate means for individuals with invisible illnesses to communicate about their disabilities and reinforce that certain behavior is a product of one's invisible illness, is beyond her/his control, and is unlikely to change. Though speculative, these findings may suggest that the recipients of verbal disclosures better accept that the individual is truly suffering from the invisible illness. Verbal, direct disclosures may seem more honest or believable, as the person with the illness is directly addressing the issue, rather than assuming that the target understands their circumstances based on nonverbal cues alone. Though appearance is associated with the attribution process (Stanley & Standen, 2000), in the present study, nonverbal disclosures do not seem to provide the same clarity about the causes of behavior as verbal disclosures. Though a fear of misunderstanding may prevent people with certain diseases from sharing their experiences verbally (Booker et al., 2006), verbal disclosures may nonetheless be the most effective means of communicating about one's invisible illness. These findings may thus imply that verbal disclosures are necessary for individuals with invisible illnesses to avoid incorrect attributions by others.

Interestingly, the presence of a verbal disclosure alongside a nonverbal disclosure does not appear to be particularly beneficial for individuals disclosing their invisible illnesses. These results may have theoretical importance for disclosure scholars, as they suggest that diversifying forms of disclosure is not always beneficial. Returning to the definition of self-disclosure offered earlier, self-disclosure is often conceptualized as deliberately divulging personal information (Green et al., 2006). Though the present study was not concerned originally with the intentionality of the disclosure (as some nonverbal disclosures are less intentional), perhaps verbal disclosures regarding invisible illnesses are perceived as more intentional, and such perceived deliberateness in disclosing may have a positive influence on the target's attributions. The results revealed that the combination of nonverbal and verbal disclosures together elicited the strongest internal attributions and perceptions of controllability. In other words, similar to nonverbal disclosures alone, the combined disclosures were associated with people assuming that it was an individual's own decision not to participate in the activity (rather than the result of their invisible illness) and that the individual could have changed their behavior if they wanted. The presence of the nonverbal disclosure, even alongside the verbal disclosure, may have given the impression that the pain is inconsistent. Because a neck brace is not usually considered a permanent item, but rather is often used during recovery from other ailments, individuals may assume that whatever condition necessitating its use is also impermanent. If that was the case, then it may have been assumed that the individual could choose to participate in the avoided activity when the pain subsides and the neck brace is no longer needed. It is also possible that different results may arise with more specific verbal disclosures, such as disclosures that further explain the role of the neck brace in dealing with the invisible illness.

Implications and Future Directions

The present study provides a starting point for understanding the effects of disclosure on the attribution process for individuals with invisible illnesses, though future research should address other conditions that impact the attribution of illness disclosures. For example, future studies might explore how the attribution process changes when the nonverbal disclosure indicates a permanent rather than temporary state. Studies might

also address the impact of the language used in the disclosure (e.g., positive, negative, and emotion words) on attributions and offer a more micro-level analysis of the disclosure process.

Although the aim of this study was to explore the relationship between disclosure type and the type of attribution made about invisible illnesses, the present findings also highlight the importance of understanding attributions made in response to photographs and text. Social media has become a primary means for individuals to share updates about their lives with their social networks. On websites such as Facebook, individuals often alert their networks to important life events via status updates, messaging, and wall posts. It is becoming increasingly common for individuals to disclose important aspects of themselves by sharing photos and including relevant captions with these photos. Beyond Facebook, the trend of sharing photos is seen in other social networking platforms such as Instagram and Snapchat—phone applications dedicated solely to photo sharing. As photo-sharing becomes an increasingly popular means of disclosing life events, it is necessary to explore the ways that on-lookers process such information and the implications for future interaction. Our findings suggest that nonverbal disclosures, such as those made through sharing pictures online, may result in inaccurate attributions, especially for those with invisible illnesses. Future research would benefit from further exploring health-related disclosures in online contexts. It would be particularly useful to explore differences in attributions following verbal and nonverbal disclosures based on public knowledge of an illness. For example, it is possible that illnesses that people are less aware of (such as invisible illnesses and CRPS) necessitate verbal disclosures, while illnesses that are more familiar or regularly covered in the media may not necessitate such disclosures. Investigating a multitude of illnesses and the related attribution processes may reveal unique patterns particular to certain types of illnesses.

Future research should also explore if the attribution process will vary when the nonverbal disclosure comes in the form of a physical aid (i.e., medical apparatuses such as wheelchairs, slings, crutches, casts) rather than in the form of an emotional depiction of distress (crying, frowning, grabbing at a limb with a pained expression). Different types of aids or physical abnormalities (e.g., limb deformity, skin discoloration) may have different effects based on the perceived severity associated with each.

While this study offers insights into the relationship between invisible illnesses and the attribution process, the study is not without limitations. One limitation involves the scales created for this study. It is possible that participants felt confined by the attributions listed, and may have attributed the behavior to reasons not included in the provided items. A second limitation is that participants were given limited information about the target (i.e., Mark). Providing a longer narrative about the event and/or behavior before being exposed to a condition may have aided the participants in making attributions about Mark's behavior. A final limitation is that the verbal disclosure came in the form of one-way communication, in which participants were not given the chance to respond. In real-life scenarios, receivers would be able to ask for clarification about the disclosure and its repercussions.

Conclusion

The findings from this study provide insight into how people with invisible illnesses should disclose their illness in order to achieve desired results (e.g., understanding, empathy, etc.). More specifically, the study revealed that nonverbal disclosures were associated with a greater likelihood of viewing an individual with CRPS as being internally responsible for and having greater control over their behavior or decision, and the behavior was viewed as less stable. The findings also revealed that verbal disclosures were associated with being perceived as less responsible (i.e., external locus of control) and having less control over the behavior or decision, but the behavior was viewed as more stable. Furthermore, when nonverbal disclosure took place either independently or in conjunction with a verbal disclosure, greater internal attributions occurred and the individual was perceived as having more control than when the verbal disclosure occurred alone. Lastly, using only nonverbal disclosures was associated with less stable attributions. While this study has implications for social media, the findings also reinforce the need for researchers to continue to investigate the associates between disclosure and the attribution process. The results of this experiment can be used to help design an appropriate intervention that explains the benefits of disclosure and encourages individuals with invisible illnesses to verbally disclose their illnesses to others when appropriate. The goal of such communication would be to help others understand that certain behaviors are a result of the illness (external attribution) and beyond the person's control. In sum, the results of the present study reinforce the importance of exploring disclosure processes in health contexts and suggest that individuals with invisible illnesses face unique challenges when communicating about their illness and its effects on their everyday behaviors.

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Appendix A

Images Used in Experiment

Table 1 *Correlations Between Disclosure Conditions and Attribution Variables*

	1	2	3	4	5	6
1. Nonverbal	1	-.500**	.501**	.270**	-.269**	.167**
2. Verbal	-.500**	1	.499**	-.117**	.443**	-.051
3. Interaction	.501**	.499**	1	.153**	.173**	.116**
4. Locus of Control	.270**	-.117**	.153**	1	-.292**	.623**
5. Stability	-.269**	.443**	.173**	-.292**	1	-.232**
6. Controllability	.167**	-.051	.116**	.623**	-.232**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2 *One-Way ANOVA of Attribution Variables*

		Sum of Squares	df	Mean Square	F	Sig.
Locusof Control	Between Groups	266.294	3	88.765	342.506	.000
	Within Groups	258.125	996	.259		
	Total	524.419	999			
Stability	Between Groups	156.776	3	52.259	66.109	.000
	Within Groups	788.908	998	.790		
	Total	945.684	1001			
Controllability	Between Groups	245.061	3	81.687	134.202	.000
	Within Groups	605.644	995	.609		
	Total	850.705	998			