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Crip for a Day: The Unintended Negative Consequences of Disability Simulations

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Objective: To investigate the impact of disability simulations on mood, self-ascribed disability stereotypes, attitudes about interacting with disabled individuals, and behavioral intentions for improving campus accessibility. **Design:** Experiment 1 evaluated disability-awareness simulations by randomly assigning undergraduates ($N = 60$) with and without disabilities to stations simulating either dyslexia, hearing or mobility impairments. Experiment 2 extended the field study into the lab where undergraduates ($N = 50$) with and without disabilities each completed low vision, hearing impairment, and dyslexia simulations. Both studies incorporated pretest–posttest measures of mood, self-ascribed disability stereotypes, and attitudinal measures. **Results:** In both experiments, disability simulations made participants feel more confused, embarrassed, helpless, and more vulnerable to becoming disabled themselves compared to baseline. Following the simulations, empathetic concern (warmth) toward disabled people increased in both studies, but attitudes about interacting did not improve. In Experiment 1, postsimulation anxiety, embarrassment, and helplessness were highest for those who used wheelchairs or simulated dyslexia. In Experiment 2, participants judged themselves less competent, expressed more pity, expressed more interaction discomfort, and were not more willing to interview disabled students for an accessibility project following the simulations compared to baseline. In addition, Experiment 2 found frustration, guilt, anxiety, and depression were most pronounced among those who interacted with disabled people less than once per month. **Conclusions:** Simulating disabilities promotes distress and fails to improve attitudes toward disabled people, undermining efforts to improve integration even while participants report more empathetic concern and “understanding of what the disability experience is like.”

Impact and Implications

Few have published empirically reliable studies evaluating the effects of simulating physical, cognitive, and sensory disabilities on emotions, self-stereotyping, and attitudes about improving the integration of people with disabilities. This article is the first to integrate and extend the often-contradictory literatures on perspective taking and disability simulation, advancing a critique of some of the most popular, albeit controversial, disability awareness activities practiced. Using both disabled and nondisabled participants, these two experimental studies provide convergent support for the negative consequences of artificially simulating disability—consequences that vary by simulation type and frequency of contact with disabled people. These findings confirm what disability advocates have long expressed—that simulations can subvert their intended educational value and distort the realities of life with disability. Based on this review of evidence, rehabilitation providers and educators should consider alternatives to traditional disability simulations which continue to reinforce outdated, ableist ideas by emphasizing early-onset limitations, and failing to expose structural barriers to participation or disability as a lived experience and cultural identity (Nario-Redmond, Noel, & Fern, 2013; Nario-Redmond & Oleson, 2016). Recommendations are provided for more inclusive curricula that incorporates contemporary representations of disability, insider expertise, and awareness of strategies for challenging discrimination and promoting disability justice.

Keywords: ableism, disability awareness, disability simulation, perspective taking

Introduction

By focusing cultural and societal awareness on certain facets of the disability experience (e.g., on impairment) to the exclusion or obfus-

cation of other facets of the disability experience (e.g., disability oppression and discrimination), it becomes clear to us that dominant approaches to disability simulation (e.g., simulation of impairment) serve to constitute and reproduce, rather than disrupt, disability oppression. (Lalvani & Broderick, 2013, p. 469)

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For many years, education and rehabilitation professionals have emphasized the value of interactive role-playing experiences to improve disability attitudes and increase understanding using both vicarious and direct forms of perspective taking (Burgstahler & Doe, 2004). However, these activities—referred to as disability simulations—have only recently been subject to empirical scrutiny (Flower, Burns, & Bottsford-Miller, 2007). There remains a strong assumption that as a pedagogical tool, role-playing blindness,

deafness, and paralysis can accurately capture the disability experience through approximations of altered embodiment that are neither permanent nor complete (French, 1996).

The repertoire of disability simulation primarily involves “taking on” physical and sensory impairments related to low vision, hearing loss, and mobility limitations (Kiger, 1992). However, some attempt to approximate age-related cognitive deficits (Pacala, Boulton, & Hepburn, 2006), and psychiatric conditions as well (Ando, Clement, Barley, & Thornicroft, 2011). Ear plugs are often used to simulate deafness, blindfolds or special glasses simulate low vision, and wheelchairs or restraints that bind the legs or arms are typical in paralysis simulations. These exercises are common to disability awareness programming in public and private schools, college campuses, medical programs, and professional training seminars (Hartwell, 2001; Lindsay & Edwards, 2013). Practitioners of these “arresting educational techniques” swear by their popularity to engage students and stimulate discussion (Pacala et al., 2006), and the practice continues despite mounting criticisms from many scholars within the disability community warning of their unintended consequences (Blaser, 2003; Brew-Parrish, 2004; Lalvani & Broderick, 2013). Surprisingly few studies have evaluated the efficacy of disability simulations across knowledge, attitudinal, and behavioral outcomes (Kiger, 1992). Does the use of a wheelchair for an hour or even a day provide an accurate window into the liberation associated with mobility, the creativity involved in navigating through environmental barriers, or the affirmation of one’s humanity linked to accessible spaces?

The primary goal when administering disability simulations is to grant nondisabled people an opportunity to improve understanding and acceptance of people with disabilities. Instead of just imagining what disability must be like, simulations allow people to role-play through personal experience. This kind of perspective taking is built on the assumption that people cannot fully understand the circumstances facing disabled people unless they know first-hand how disabled people seem to do what they do. This is similar to the ideas represented in John Howard Griffin’s famous journalism project, *Black Like Me* (Griffin, 1961), where he used melanin-depositing medication and tanning to darken his skin prior to visiting six Southern states to experience the trials of being Black in America.

Perspective-Taking Research

While few have experimentally investigated the effects of first-person disability simulations, Batson, Early, and Salvarani (1997; Batson, Polycarpou, et al., 1997; Batson, 2010) have conducted several theoretically grounded studies to examine how imagining the perspective of stigmatized others affects empathy, attitudes, and willingness to help. They found that attitudes were more positive toward the homeless and those living with AIDS when people were asked to first imagine their circumstances compared to those not induced to assume their perspective. Furthermore, feelings of empathy were shown to mediate the effects of perspective taking on attitude change (Batson, Polycarpou, et al., 1997). Empathetic concern through perspective taking has also been linked to increased helping behaviors (Cialdini, Brown, Lewis, Luce, & Neuberg, 1997), volunteerism, and charitable donations (Bekkers, 2010; Penner, 2002). Similar results have been repli-

cated across racial minorities, drug addicts, convicts, and people with disabilities (Todd & Galinsky, 2014).

More recent research has identified an important caveat to the perspective taking-empathy relationship based on the extent to which the self “overlaps” the other person whose circumstances are imagined (Myers, Laurent, & Hodges, 2014). That is, perspective taking may facilitate self-other merging, where the self and the imagined other become mentally intertwined (Davis, Conklin, Smith, & Luce, 1996). This self-other merging can increase identification and implicit associations with an imagined outgroup leading to more positive outgroup conceptions (Todd, Bodenhausen, & Galinsky, 2012). Self-other merging can also lead to self-stereotyping across stigmatized groups. For example, when taking the perspective of an elderly man, people considered themselves weaker and more dependent than those who did not take his perspective, and behaved more stereotypically as well (Galinsky, Wang, & Ku, 2008).

Emotional consequences differ dramatically depending on whether one imagines what life is like for the other or imagines oneself in the position of the other. Batson, Early, and Salvarani (1997) found that imagining how someone else feels about a traumatic accident, instead of imagining how “you yourself” would feel, produced more empathy for the individual imagined and less personal distress for the perceiver. While both approaches produced empathy—imagining how one would feel in the same situation resulted in more negative affect—feeling distressed, alarmed, troubled, and perturbed. The authors speculated that “imagining yourself” experiencing a traumatic event may elicit more self-oriented empathy and egotistical concerns. By contrast, imagining what a trauma is like for another person may elicit more other-oriented empathy and altruistic concerns (Batson, Early, & Salvarani, 1997).

Generosity also depends on who is imagined as gaining or losing a preferential outcome (Batson et al., 2003). When one starts off with an unearned privilege that could be distributed more equally, then imagining oneself as the disadvantaged other (e.g., how would I want to be treated) produces more benevolence and fairer outcomes than not taking a perspective at all. By contrast, when a limited resource can only be assigned to one person, then imagining how someone else would feel (e.g., how would they want to be treated) produces more benevolence than imagining how I would feel or not taking a perspective at all. When it comes to charitable giving, imagining the perspective of the recipient is associated with more willingness to help and more donations compared to imagining oneself from the perspective of the donor (Hung & Wyer, 2009). Therefore, helping behaviors in the form of volunteer time and money seem most effectively encouraged when participants take the other’s perspective rather than their own.

The specific antecedents and motivations for empathy are important because empathy can facilitate immediate and long-lasting positive attitudes toward stigmatized groups (Batson, 2010; Davis & Begovic, 2014). The distinction between these findings and the limited evidence on disability simulations, however, is that simulations require participants to personally experience an artificially manufactured version of disability rather than having them imagine the problems that people with disabilities actually confront. Simulating the experience of any minority group is problematic, particularly when the imagined target is portrayed in stereotypical

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terms. Under these conditions, perspective-taking manipulations can lead to greater stereotyping (Skorinko & Sinclair, 2013).

In brief, perspective taking has been found to produce complex outcomes: It can increase how connected people feel to members of outgroups while contributing to stereotypical judgments, self-perceptions, and behaviors. Research also suggests that imagining oneself in the place of others—rather than taking the other's perspective—is less effective at inducing empathy and help. These findings have significant implications for interventions that seek to provide first-person experiences of marginalized identities.

Disability-Simulations Research

In contrast to perspective-taking interventions, disability simulations typically involve nondisabled people doing ordinary activities with alterations meant to mimic the assumed physical, sensory, and motor challenges disabled people face. Some simulations require students to eat a meal or perform everyday tasks while blindfolded, wearing earplugs, or maneuvering a hospital-style wheelchair with a focus on what cannot be done independently. The stated goals of most of these educational enterprises is to increase understanding and improve attitudes toward disabled people. Despite good intentions, little empirical evidence supports that disability simulations accomplish these goals (Kiger, 1992). For example, a systematic review of disability awareness interventions for children found only four simulation studies between 1980 and 2011 with at least one measured outcome for evaluation (Lindsay & Edwards, 2013). Only one of these studies was considered effective at increasing knowledge about barriers to accessibility, particularly for fifth and sixth graders. However, instead of directly simulating impairments, this study utilized a virtual reality game where children vicariously simulated the navigation of obstacles from the purview of a wheelchair user (Pivik, McComas, Macfarlane, & Laflamme, 2002). The other studies found mixed evidence. The authors concluded that “the data were inadequate to make a recommendation on the effectiveness of this type of intervention” (Lindsay & Edwards, 2013, p. 642).

One of the earliest experimental simulation studies compared undergraduates taking a 25-min campus tour while either walking alone, playing the role of a wheelchair user, or walking behind a wheelchair user to observe their experiences (Clare & Jeffery, 1972). No differences were found between those who used the wheelchair and those who followed another wheelchair user. Both groups expressed more empathetic concern, anxiety, and favorable attitudes toward disability issues compared to the control group—effects that persisted 4 months later. However, neither direct nor vicarious role playing impacted students' willingness to volunteer to meet with prospective students with disabilities. A more recent investigation found that individuals who participated in blindness simulations judged blind individuals as less capable of working and living independently than people who either simulated amputation or did no simulation at all (Silverman et al., 2015). Furthermore, blindness simulators forecasted that their own lives would remain limited—even after 3 years of imagined future blindness.

Flower et al. (2007) conducted a meta-analysis to evaluate the impact of 10 studies that simulated orthopedic, cognitive, visual, and hearing impairments: Not only did the simulations produce small attitude-change effects, 6 out of 17 results showed attitudes changed for the worse as a result of the simulation activities.

Compared to interventions that used a combination of educational programming (e.g., videos and face-to-face contact with disabled people)—direct simulations were the least effective. The authors concluded that while not necessarily harmful, the utility of disability simulations was not supported, and discontinuation was recommended.

A decade-long review of the Aging Game curricula which simulates progressive dependency (e.g., arm slings for arthritis, and disorienting instructions for cognitive decline) found “two general categories of behavioral responses—withdrawal and aggression—that students invariably exhibit when participating in the simulation experience” (Pacala et al., 2006, p. 145). Unfortunately, less than half of the estimated 1,500 medical students who participated in the Aging Game over the 10-year period completed the optional evaluations. Those who did consistently rated the simulations to be both interesting and educationally valuable. Even when the evidence suggests otherwise, simulations are often judged to be successful not only because they are entertaining, but because many are designed to instigate the frustration and fear assumed to characterize life with disability (French, 1996).

In a separate review of 10 studies simulating visual and auditory hallucinations associated with schizophrenia, Ando et al. (2011) found increased empathetic concern coincided with ambivalent attitudes, negative emotions, physical distress, and a greater desire to distance from those experiencing mental illnesses. Yet, participants (psychology, nursing, and medical students) assumed they had a better understanding of the insider's perspective, and considered psychiatric simulations to be acceptable educational tools. Galletly and Burton (2011) argued that when simulations are combined with an insider's personal account, positive changes can occur. They gave medical students the opportunity to listen to someone discuss his experiences with schizophrenia before they simulated auditory hallucinations. Following the workshop, attitudes improved but only among those with the most negative attitudes toward mental illness. In other studies where insider perspectives were not included, simulations of auditory hallucinations have led to increased social rejection (S. A. Brown, Evans, Espenschiede, & O'Connor, 2010), and diminished empathetic responses, particularly among those with low empathy at the outset (Bunn & Terpstra, 2009). These findings suggest that the impact of simulations may depend on other moderating variables including frequency and quality of contact with disabled people as contact predicts both future interactions and positive attitudes (MacMillan, Tarrant, Abraham, & Morris, 2014).

Disability-Simulation Critiques

In contrast to educational approaches that incorporate personal accounts (Mann & Himelein, 2008), disability simulations have come under increasing scrutiny (Lavani & Broderick, 2013; Valle & Connor, 2011). Criticisms emphasize the inauthentic portrayals of disablement that misinform those required to perform them (Asch & McCarthy, 2003). Importantly, simulations misattribute the source of disadvantage to personal deficit while ignoring environmental barriers and policies that discriminate against certain types of minds and bodies (Scullion, 1996). Simulations focus almost exclusively on what a newly acquired disability might be like, even though participants realize their own “disability status” is not permanent (French, 1996). Temporary simulations simply

simulations must focus on the barriers as a limit, not on the disability

fail to account for the diverse coping mechanisms acquired from living long-term with disability (Wright, 1980). Instead, they emphasize the instantaneous absence of familiar embodiment (Wilson & Alcorn, 1969). For example, people who have grown up Deaf have learned many creative ways to navigate without sound using other sensory cues and communicating in sign language. This is not something that can be simulated in a few minutes of having one's ears plugged, and reflects an ableist perspective that emphasizes loss and limitation rather than the lived experience in an often-discriminatory world.

Finally, disability simulations not only distort the reality of disability, but reproduce stereotypes related to incompetence and dependency (Nario-Redmond, 2010), especially when focused on personal limitations. Consistent with this idea, Silverman et al. (2015) found that those simulating blindness judged blind people as less capable of independent living, but not less competent when compared to nonsimulating controls. Interestingly, those simulating blindness also expressed more warmth toward blind people (Experiment 2) than controls, while those simulating arm amputation rated blind people as less warm than controls (Experiment 1). These mixed findings highlight the importance of differentiating between measures of warmth and capacity or competence, as each may have different implications for employment and educational and interpersonal contexts (Cuddy, Fiske, & Glick, 2008).

In summary, most disability simulations focus on how physical, learning, and psychiatric conditions affect individual functioning instead of making salient the socially created obstacles, inaccessible spaces and practices that systematically exclude (but see Barney, 2012; Pivik et al., 2002). Despite these shortcomings, simulations have sparked much interest in the topic of disability. While producing inconsistent results, simulation games may persist because they increase tolerance for ambiguity and spark conversation (Bredemeier & Greenblat, 1981). People may also enjoy simulations because they fulfill curiosity with a token experience of temporary distress that once relieved may instigate a sense of gratitude for one's current abilities.

Rationale: The Present Investigation

In line with much theoretically informed research on perspective taking, imagining oneself in the place of stigmatized others can be threatening, and empathetic concern can coincide with a desire for greater social distance. Although not based in theory, disability simulations also require taking the place of individuals with disabilities. It is reasonable to expect that these activities too may stimulate empathetic concern while simultaneously increasing anxiety, frustration, and other indicators of personal distress. To date, however, no studies have examined how disability simulations affect mood-specific reactions, interaction attitudes, and behavioral intentions in addition to disability self-stereotyping. The present investigation was designed to address this gap with two experiments examining the cognitive, emotional, and behavioral consequences of simulating both single and multiple disabilities in college student samples. We had three hypotheses for both experiments.

1. Compared to baseline, disability simulations will reduce emotional well-being (increase negative mood states).

2. Compared to baseline, disability simulations will increase self-ascribed disability stereotypes (increase helplessness, frustration, embarrassment, incompetence).
3. Compared to baseline, disability simulations will increase empathetic concern (warmth) and negative interaction attitudes, but will reduce behavioral intentions toward improving access for people with disabilities on a college campus (Experiment 2).

Method

To test these hypotheses, both field and laboratory experiments were used. The field study capitalized on campus-wide disability awareness programming with baseline data collected from undergraduate classes in psychology. Students participated in disability simulation activities set up at three different stations in the dining hall prior to completing postmeasures. While the researchers did not control the activity stations, they were permitted to evaluate their impact. Experiment 1 used a 2 (pre-post) \times 3 (disability simulation type: hearing loss, dyslexia, mobility impairment) mixed-model design where simulation type was a between-subjects factor. The second experiment was conducted in a more controlled laboratory setting where each participant was exposed to all three simulation activities: hearing loss, dyslexia, and a new activity involving the simulation of low vision.¹ Experiment 2 used a 2 (pre-post) \times 2 (contact: less than once per month, more than once per month) mixed-model design where contact was a between-subjects factor.

Experiment 1

Participants. Sixty undergraduate students (23 male, 37 female) were recruited for partial credit from psychology classes at a small liberal arts college in the midwest. Participants were 18 to 25 years old ($M = 20$, $SD = 1.45$). Only 22% identified as ethnic minorities, and 30% indicated they experienced physical ($n = 7$), psychiatric ($n = 8$), learning ($n = 7$), sensory ($n = 1$), chronic health, or other disabling conditions ($n = 3$) personally.

Measures. Measures included the 30-item Profile of Mood States—Short Form (POMS-SF; EdITS, 1999), the Interaction with Disabled People Scale (IDPS; Gething & Wheeler, 1992), and a measure of self-ascribed stereotypic traits associated with disability created for this study. Participants also provided their thoughts about the simulations via open-ended responses. The POMS-SF measures current mood states with six subscales: anxiety (e.g., *uneasy, nervous*), hostility (e.g., *grouchy, annoyed*), fatigue (e.g., *worn out, exhausted*), depression (e.g., *discouraged, unworthy*), activity (e.g., *vigorous, energetic*), and confusion (e.g., *bewildered, muddled*) on 0 (*not at all*) to 4 (*extremely*) response scales. The stereotype traits measure captured the extent to which participants described themselves as currently feeling *helpless, competent, frustrated, embarrassed, attractive, and guilty*—traits that correspond to consensually held stereotypes about disabled

why no positive emotions included

¹ Commercially available low-vision goggles were purchased to simulate general impaired acuity 20/200 (6/60) from www.lowvisionsimulations.com. Hearing loss was simulated using standard noise-cancelling headphones.

Isn't it biased if no positive emotion is evaluated? (If you ask me if I'm tired, I might say yes, but if you ask me if I feel good, the answer might be yes too -> the emphasis on tiredness misses the big picture on the overall feeling that can be positive even if I'm a little tired because other factors must be taken into account too)

people (Nario-Redmond, 2010), using the same 0–4 response scale. The IDPS was constructed as a measure of attitudes toward interacting with disabled people, and includes subscales for vulnerability (e.g., “I dread the thought that I could someday end up like them”; “I am grateful that I do not have such a burden”), sympathetic pity (e.g., “I admire their ability to cope”; “It hurts me when they want to do something and cannot”), and discomfort (e.g., “I feel uncomfortable and find it hard to relax”; “I am afraid to look at the person straight in the face), using a –3 (disagree) to +3 (agree) scale. To capture feelings of empathetic concern, participants located their feelings toward people with disabilities on a scale ranging from 0 (*very cold*) to 100 (*very warm*).

Procedure. Pretest measures were given in the classroom prior to participants engaging in the simulations in the campus dining hall as part of disability awareness week. They were randomly assigned to visit one of three standard simulations. Hearing impairment was simulated at one table by having students wear ear plugs while attempting to read the lips of another student who read a 1-min passage. To simulate dyslexia, students were asked to read a 1-min news story that had each word typed backward; this is one of the most popular—albeit inaccurate—simulations of dyslexia conducted across educational contexts (Wadlington et al., 2008). Mobility impairment was simulated by having students get their meals using a hospital wheelchair. Posttest measures were given immediately following the simulations.

Experiment 2

Participants. Fifty undergraduate students (17 male, 33 female) enrolled in a general psychology class at a small midwestern college participated as part of the course requirement. They ranged in age from 18 to 22 years ($M = 19$, $SD = 1.19$). Just over half (52%) said they had personal contact with disabled people less than once per month; fewer reported contact once a month or more (48%). Sixteen percent identified as ethnic minorities, and 38% personally experienced physical ($n = 8$), psychiatric ($n = 3$), learning ($n = 7$), sensory ($n = 4$), chronic health, or other disabling conditions ($n = 7$).

Measures. The mood, stereotyping, and attitude scales were identical to those used in Experiment 1. Contact with disabled people was assessed with a single item (R. Brown, Vivian, & Hewstone, 1999) asking how frequently participants had one to one contact with people known to experience a disability with options ranging from *never* (1) to *daily* (7). These responses were then recoded into two categories (less than once per month or once per month or higher). In order to capture behavioral intentions, participants were asked about their willingness to volunteer for an upcoming campus accessibility project. They were told that in the near future, on-site researchers would be interviewing students with sensory, learning, and physical disabilities from area colleges to gather ideas about how to make the campus more welcoming and accessible to students with disabilities. They were asked to indicate how many 10- to 15-min scripted interviews they were willing to conduct from a list of eight options that ranged from 15 min (conduct one interview) to 120 min (conduct eight interviews), and included an option for those not willing to volunteer. All were told they would be contacted later to set up appointments at their convenience.

Procedure. Participants were scheduled individually to take part in three different disability simulations (low vision, hearing loss, and dyslexia), presented in that order. They completed pretest measures when arriving for the study. To control for stimulus content and activity duration, each simulation used a modified version of the same 102-word paragraph describing a generic set of driving directions. Prior to the first simulation, participants were told, “Now you are going to simulate low vision. Please wear these goggles and read this text out loud at a normal pace.” Prior to the second activity, participants were told, “Now you are going to simulate a hearing impairment. Please put the earplugs in your ears and wear these headphones. Listen to what I am going to read to you.” For the final activity, they were instructed, “Now you are going to simulate a reading disability. Please read this text out loud at a normal pace.” Following each simulation, participants were given 3 min to write out their impressions prior to completing posttest measures. All were thoroughly debriefed, and reminded that while popular with educators, disability simulations have also been criticized as not accurately representing the disability experience (French, 1996).

Results and Discussion

Experiment 1

To examine the impact of the disability simulations on mood, stereotypic descriptions, and attitudes toward disabled people, a 3 (disability simulation type) \times 2 (pre-post score) mixed-model analysis of variance (ANOVA) was performed separately for each dependent variable. Although we had no a priori prediction about the impact of the different simulation exercises, Table 1 provides the means and standard deviations for significant main effects and interactions (e.g., when changes were greater among those simulating mobility compared to hearing or learning disabilities).

Changes in mood. As shown in Table 1, the POMS-SF results revealed that overall participants felt more confusion postsimulation compared to baseline, $F(1, 53) = 18.55$, $p < .001$. Following the simulations, they also reported more anxiety, $F(1, 53) = 5.14$, $p < .03$, and this difference interacted with the type of simulation performed, $F(2, 53) = 5.51$, $p < .01$. Simple effects showed that compared to baseline, anxiety levels were nearly twice as high for those who simulated a mobility impairment, $F(1, 53) = 5.77$, $p < .02$, and also increased for those who read a paragraph backward to simulate dyslexia, $F(1, 53) = 5.98$, $p < .02$. Anxiety levels did not increase reliably among those who wore earplugs to simulate hearing loss. Compared to baseline, participants reported feeling less fatigued postsimulation, $F(1, 53) = 5.54$, $p < .02$, and this too depended on simulation type, $F(2, 53) = 3.27$, $p < .05$. Only those who wore earplugs while attempting to read another student’s lips were reliably less fatigued following the simulation, $F(1, 53) = 15.99$, $p < .000$. Finally, changes in hostility interacted with simulation type, $F(2, 53) = 4.99$, $p < .01$; only participants who simulated dyslexia reported increased hostility, $F(1, 53) = 9.47$, $p < .01$.

Changes in self-stereotypes. Results from the self-ascribed disability stereotypes measure showed that after engaging in disability simulations, participants felt more frustration, $F(1, 53) = 5.93$, $p < .02$, which did not depend on simulation type. Compared to baseline, participants also felt more embarrassed, $F(1, 53) = 27.13$, $p < .000$, with differences interacting with simulation type,

Table 1
Means and Standard Deviations for Outcome Variables That Changed Significantly From
Pretest to Posttest Overall, and Within Specific Simulation (Experiment 1) and Contact
Conditions (Experiment 2)

Outcome	Experiment 1		Experiment 2	
	Pretest	Posttest	Pretest	Posttest
Overall				
Mood—POMS-SF				
Confused	0.75 (0.50)	1.10 (0.69)	0.91 (0.52)	1.28 (0.65)
Anxious	0.78 (0.67)	0.92 (0.82)	0.73 (0.68)	0.91 (0.79)*
Depressed			0.42 (0.63)	0.62 (0.69)
Fatigued	1.43 (0.87)	1.16 (0.92)		
Hostile			0.38 (0.59)	0.55 (0.72)
Active			1.38 (0.77)	0.92 (0.84)
Self-stereotypic traits				
Frustrated	0.77 (0.89)	1.11 (1.14)		
Embarrassed	0.25 (0.58)	0.98 (1.12)	0.40 (0.81)	0.92 (1.01)
Helpless	0.36 (0.67)	0.98 (1.23)	0.44 (0.84)	0.88 (1.04)
Competent			2.12 (1.15)	1.54 (1.25)
Guilty			0.44 (0.86)	0.72 (1.03)
Empathy (warmth)	77.91 (17.10)	82.36 (15.42)	75.64 (15.20)	79.50 (15.79)
Interaction attitudes—IDPS				
Vulnerable to disability	0.64 (1.48)	0.90 (1.51)*	0.77 (1.43)	1.18 (1.51)
Discomfort interacting			−1.42 (1.08)	−1.25 (1.30)
Pity of disabled people			1.68 (1.00)	1.87 (0.96)
Wheelchair condition				
Confused	0.51 (0.51)	1.19 (0.66)		
Anxious	0.74 (0.44)	1.34 (0.89)		
Embarrassed	0.29 (0.76)	1.86 (1.21)		
Helpless	0.57 (0.79)	2.43 (1.13)		
Dyslexia condition				
Anxious	0.72 (0.65)	1.03 (0.82)		
Hostile	0.47 (0.67)	0.82 (0.94)		
Embarrassed	0.15 (0.46)	1.11 (1.12)		
Helpless	0.37 (0.74)	0.93 (1.07)		
Hearing-loss condition				
Fatigued	1.35 (0.83)	0.83 (0.71)		
Contact < Once per month				
Anxious			0.65 (0.49)	1.03 (0.68)
Depressed			0.28 (0.34)	0.65 (0.63)
Frustrated			0.50 (0.58)	1.00 (1.06)
Guilty			0.54 (0.99)	1.04 (1.25)

Note. Unless indicated, only significant pre-post results are reported ($ps < .05$). POMS-SF and self-stereotype ratings were made on 0- to 4-point scales, IDPS on −3 to +3 scales, and empathy (warmth) on a 0–100 scale. POMS-SF = Profile of Mood States—Short Form; IDPS = Interaction with Disabled People Scale.

* $p < .10$.

$F(2, 53) = 5.40, p < .01$. Simple effects showed participants were six times more embarrassed after simulating a mobility impairment, $F(1, 53) = 14.33, p < .000$, and after simulating dyslexia, $F(1, 53) = 20.75, p < .000$. Similarly, feelings of helplessness increased postsimulation, $F(1, 53) = 37.89, p < .000$, with differences contingent on simulation type, $F(2, 53) = 7.34, p < .01$. Helplessness scores more than doubled among those who simulated dyslexia, $F(1, 53) = 9.54, p < .01$, and increased fourfold among those who simulated mobility impairment, $F(1, 53) = 27.64, p < .000$.

Changes in disability attitudes. In terms of attitudes toward interacting with disabled people, only one subscale of the IDPS approached significance. Following the simulations, participants tended to feel more vulnerable about disability, $F(1, 53) = 2.90, p < .09$; that is, they became more aware of the possibility they themselves could have a disability someday. After the simulation,

participants also expressed more empathetic concern (warmth) toward people with disabilities than before, $F(1, 53) = 16.11, p < .000$. Across outcomes, no other main effects or interactions were significant.² Of participants who provided qualitative feedback, 44% reported the simulations made them think they understood what it means to be disabled; only 12% criticized the simulations as inauthentic.

² Since 30% ($n = 18$) of participants indicated experiencing some type of disabling condition themselves, we also examined whether pre–post test scores varied as a function of participants' disability status. Only two main effects of disability status effects were observed: Compared to disabled participants, nondisabled participants felt more active and more attractive overall. No significant interactions with disability status emerged. However, in these analyses, results for the increase in perceived vulnerability to disability were significant, $F(1, 58) = 4.74, p < .03$.

Consistent with predictions, following participation in one of three disability simulations, people experienced more anxiety, especially when simulating mobility and learning disabilities. However, they were less fatigued—particularly when simulating hearing loss, trying to decipher an oral communication while wearing ear plugs. Hostility also increased for those who read a text backward to simulate dyslexia. Overall, simulating disabilities led to increased feelings of confusion and frustration, embarrassment, and helplessness—traits often associated with disability stereotypes. Increased feelings of embarrassment and helplessness were especially pronounced among those who simulated mobility and learning disabilities. Although most of the attitudinal measures were not reliably affected, following the simulations, participants reported feeling warmer toward people with disabilities. **This finding suggests that under certain conditions, simulations might contribute to empathetic concern and positive behavioral intentions toward improving access for disabled people as a group. To examine this possibility, a second study was conducted to replicate and extend these findings. This second study also explored whether the effects of simulating disability depended on the frequency with which participants interacted with disabled people.**

Experiment 2

To examine the impact of the simulations on mood, stereotypic descriptions, attitudes, and behavioral intentions as a function of interpersonal contact, a 2 (contact: less than once per month, more than once per month) \times 2 (pre-post score) mixed-model ANOVA was performed separately for each dependent variable.

Changes in mood. As shown in Table 1, after completing the three disability simulations, participants were more confused, $F(1, 48) = 24.43, p < .000$, less active, $F(1, 48) = 42.28, p < .000$, and more hostile, $F(1, 48) = 4.33, p < .05$, compared to baseline. After the simulations, participants also felt more depressed, $F(1, 48) = 5.48, p < .02$, and this effect depended on frequency of contact, $F(1, 48) = 4.58, p < .04$. Specifically, **depression increased reliably only for those who interacted with disabled people less than once per month, $F(1, 48) = 10.45, p < .01$. Similarly, changes in anxiety depended on frequency of contact, $F(1, 48) = 4.39, p < .04$; only those who infrequently interacted with disabled people showed increased levels of anxiety, $F(1, 48) = 7.45, p < .01$.**

Changes in self-stereotypes. Results from the self-ascribed disability stereotypes showed that **after engaging in disability simulations, participants felt more helpless, $F(1, 48) = 8.17, p < .01$, less competent, $F(1, 48) = 15.40, p < .000$, more embarrassed, $F(1, 48) = 15.31, p < .000$, and more guilty, $F(1, 48) = 5.97, p < .02$, compared to baseline. Changes in guilt depended on frequency of contact, $F(1, 48) = 4.27, p < .05$; guilt reliably increased only for those interacting with disabled people less than once per month, $F(1, 48) = 10.59, p < .01$. Frustration levels also **interacted with contact, $F(1, 48) = 4.95, p < .03$. Again, only those with less contact showed reliable increases in frustration, $F(1, 48) = 5.80, p < .02$.****

Changes in disability attitudes and behavioral intentions. Consistent with Study 1, following the simulations, participants **felt more vulnerable about becoming disabled themselves, $F(1, 48) = 13.93, p < .01$. Furthermore after simulating disability, participants expressed more discomfort about interacting, $F(1,$**

48) = 4.38, $p < .05$, and more pity toward people with disabilities, $F(1, 48) = 4.38, p < .05$. Replicating Experiment 1, ratings of warmth toward people with disabilities increased post simulation, $F(1, 48) = 7.75, p < .01$. However, the simulation activities did not translate into a greater willingness to volunteer to improve campus accessibility ($F < 1$). On average, participants were willing to volunteer for one interview with disabled students before ($M = 22.31$ min) and after ($M = 19.21$ min) the simulations. Across outcomes, no other main effects or interactions were significant.³ However, participants' open-ended comments about the experience were instructive: "It was horrible" (106). "It made it hard to imagine ever living with a disability" (216). "You feel like you are stupid" (109). "I felt incapable [sic]" (122). Yet, some remained convinced that these activities allowed them "to experience what they go through" (123).

Extending Study 1, a combination of disability simulations increased negative moods producing more confusion, depression, anger, and a less active orientation. Consistent with this idea, simulations of disability left people feeling more stereotypically disabled themselves: more helpless, less competent, and more embarrassed and guilty. In fact, guilt, frustration and anxiety increased most among those who interacted with disabled people the least. Study 2 also found that a combination of disability simulations actually worsened attitudes about interacting with disabled people in the future. **After completing all three simulation activities, people expressed more pity and discomfort about meeting someone with a disability, and felt more vulnerable about becoming disabled themselves.** Although empathetic concern (warmth) toward disabled people increased, willingness to volunteer to increase campus access did not.

General Discussion

Advancing the limited research on the impact of simulating physical, cognitive, and sensory impairments for emotional reactions, self-stereotypes, attitudes, and behavioral intentions, the present investigation documents several negative consequences of these popular interventions. For the first time, across disabled and nondisabled participants in field and laboratory experiments, simulating disabilities increased negative emotions and self-ascribed disability stereotypes while heightening feelings of empathetic concern (warmth) toward disabled people as a group. Both experiments left people feeling more confused, anxious, embarrassed, helpless, and more vulnerable to becoming disabled themselves. In both studies simulations failed to improve attitudes about interacting with disabled people. In fact, in Experiment 2, interaction attitudes worsened, and people were not more willing to interview disabled students for a campus accessibility project. Replicating previous psychiatric simulation studies (Ando et al., 2011), and in line with meta-analyses (Flower et al., 2007), the utility of disability simulations was not supported—they led to more harm, undermining the goal of improved understanding.

Negative outcomes were most pronounced when participants simulated physical impairments and reading disabilities (Experiment 1), and for those who had less familiarity with disabled people (Experiment 2). Although our field experiment showed less

³ Disability status effects were not replicated in Experiment 2, nor did disability status moderate any results.

evidence of attitude change, negative attitudes and self-stereotypes clearly emerged in the lab. Under these more controlled conditions, not only did people feel more vulnerable about becoming disabled themselves, they also expressed more pity, more interaction discomfort, and felt less competent after the simulations than before. Other research corroborates that pity is a likely response to noncompetitive groups like disabled people stereotyped as both warm and incompetent (Cuddy et al., 2008). Sometimes expressions of warmth may reflect empathetic concern, but may also disguise paternalistic intentions, and the imposition of unwanted helping and control over those stereotyped as legitimate dependents like children, elderly people, and disabled people (Nario-Redmond, 2017). Future work is needed to disentangle these ambivalent reactions.

As demonstrated in the perspective taking literature, imagining oneself in the position of another can result in distress and self-stereotyping when the self-other divide becomes blurred, especially when the situation is threatening (Batson, Early, & Salvarani, 1997; Galinsky et al., 2008). Disability is a permeable group membership that anyone can join and many will—at least temporarily. If simulating impairments heightens one's perceived vulnerability to disability—not to mention perceived helplessness and incompetence—feelings of alarm, a desire to distance, and avoidance of help may follow. We found evidence for all of these reactions: emotional distress, the taking on of disability stereotypes, increased interaction discomfort, and little interest in helping to improve access on campus. Recall that when simulating impairments, participants are not taking the perspective of a disabled person as much as they are imagining themselves as having a new disability. Under these imagine-self conditions, more self-oriented empathy and egotistical concerns trigger personal distress and undermine altruistic responding as Batson's extensive research program clearly demonstrates (Batson, Early, & Salvarani, 1997; Batson, Polycarpou, et al., 1997). However, in contrast to previous imagine-self manipulations (Batson et al., 2003), we found that generosity in the form of volunteer time was not increased, even though our participants were arguably in the position of having an unearned privilege. That is, the self-focused experience of simulating disability did not encourage support for more equitable outcomes as it did in previous studies where participants focused on how they would want to be treated in a similar situation. Future research should examine how shifting the focus to the disabling and discriminatory aspects of society might alter these results (Barney, 2012). Perspective-taking research could also examine how perceptions of environmental accessibility depend on whether resources are presented as constrained (funds are limited or allocated only to specific groups) or unconstrained (accommodations are universal or not at the expense of others). Several lines of inquiry suggest that when people imagine—not themselves, but how others in need feel—empathetic responding and altruistic motivation is maximized while threats to self are minimized (Batson, 2010).

Some of the limitations of this research relate to our pre-post design which does not support strong causal inferences or the internal validity of a randomized control group design. Our first experiment also took advantage of campus-wide disability awareness programming; yet student participants were still randomly assigned to the simulation stations. Despite participating in only one brief simulation, this field experiment was powerful enough to

reliably impact several mood indices, self-stereotyping measures, and ratings of empathetic concern. More control over the simulation activities was achieved in Experiment 2, which utilized three simulations but did not control for order. Completing all three simulations consecutively provided for a strong manipulation, similar to most educational interventions. Unlike Experiment 1, however, there was no way to determine if any of the specific simulations had unique effects. Nevertheless, these studies make an important contribution documenting the negative effects of disability simulations, which have received little empirical attention since so often disability awareness activities are conducted without an evaluative component (Flower et al., 2007).

There is much potential for future research to establish the parameters of alternative forms of perspective taking as they relate to disability. As we demonstrated, intervention impacts are sometimes more pronounced in different contexts and depend on participant characteristics. For example, in our second study, those with more frequent interpersonal contact with disabled people did not experience increased negative affect the way other participants did. Studies of psychiatric simulations have found similar caveats where reduced empathy was observed only among those with low levels of initial empathy (Bunn & Terpstra, 2009), or attitude improvements were limited to those with prior negative attitudes (Galletly & Burton, 2011). Other individual differences related to contagion fears, death anxiety and body image may also moderate effects in addition to target stereotypicality. Similarly, inclusive settings that produce more accurate representations of disability are likely to reveal different results compared to segregated contexts.

One of the pioneers of rehabilitation psychology, Beatrice Wright (1980) warned that experiences that promote fear, aversion, and guilt often fail to contribute to constructive perspectives about disability. Evidence indicates that disability simulations are producing these exact outcomes, which should prompt educators and practitioners to consider their goals. If the goal is to establish how an acquired physical impairment can be frustrating to a new wheelchair user or how sudden onset blindness can be scary, then disability simulations may do the trick.

We suggest an alternative goal would be to increase awareness of architectural barriers, discriminatory public policy, and curricular restrictions for people with disabilities. Instead of simulating a spinal cord injury, students could be instructed to test mobility equipment to identify environmental barriers and ableist reactions (Pivik et al., 2002). Instead of pretending to be blind, students could evaluate the clarity of Web-based audio descriptions, the decipherability of text to speech software, or the time it takes to hail a cab or rent an apartment (see also Blaser, 2003; Lalvani & Broderick, 2013; Silverman, 2015). More importantly, if the goal is to understand the creative solutions people have discovered while navigating inaccessible spaces and civil rights violations, we recommend communicating with people living and working with various impairments. Disability rights activists have created blogs specifically devoted to challenging traditional simulations, and promoting disability as a positive cultural identity (Hitselberger, 2016; Ladau, 2016). Others suggest infusing disability into training programs as a facet of human diversity, similar to other social group memberships like race, gender, and sexuality, or inviting speakers to dialog, and shadowing members of the disability community (Asch & McCarthy, 2003). Some of the most effective

interventions use multiple approaches to disrupt stereotypes, expose discrimination, and arrange for equal-status contact with disabled people over several weeks (Lindsay & Edwards, 2013). There is also an emerging literature on ableism (Campbell, 2009; Nario-Redmond, 2017) that should be uniformly included in the multicultural training of undergraduate and graduate students alike.

Educators and rehabilitation professionals have a responsibility to provide students and clients with contemporary, accurate representations of disability informed by best practices such as exposure to first-hand accounts of varied disability experiences (Wood, 2014). Let us stop perpetuating dated, artificial, and degrading simulations that diminish those living with disability. Practitioners would not consider appropriating the identities of religious, ethnic, or sexual minority groups even if motivated to better understand their circumstances. Since the 1990s, researchers have repeatedly called for the cessation of traditional disability simulations based on scant evidence for their effectiveness (French, 1996; Herbert, 2000). In 2007, an analysis evaluating simulation studies conducted between 1969 and 1996 recommended discontinuation of the “questionable practice,” noting that “disability simulation is an ineffective practice among adults” (Flower et al., 2007, p. 77). Seven years later, a review of disability awareness interventions for children and youth from 1980 to 2011 also concluded that the evidence failed to support the effectiveness of disability simulations (Lindsay & Edwards, 2013). Our studies reaffirm these recommendations with evidence establishing the detrimental impacts of disability simulation for emotional well-being, self-stereotypes, and interaction attitudes. It is our hope that this call for reform is in progress, and that future interventions aim toward increasing the participation and equality of people who experience disability.

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