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# Reducing mental illness stigma: What types of images are most effective?

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## ABSTRACT

Public stigma against mental illness is a barrier to treatment and recovery. Research into the design of anti-stigma messages has focused heavily on text; there is limited information on what types of images are most persuasive in eliciting anti-stigma outcomes. This is important to study because the type of image used to depict an illness can influence how the illness is perceived, which in turn can affect how people with the illness are treated. Through an online experiment with 162 American adults, this study investigated whether mental illness narratives about depression illustrated with photographs are more effective than those illustrated with cartoons at reducing stigma. It was found that the illustrated narratives, whether with photo or cartoon, produced more anti-stigma effects than the text-only narrative (control). Further, the photographic narrative was more effective than the cartoon narrative in eliciting closeness to the story protagonist and willingness to donate to mental health services. The study's findings indicate that images should be used in anti-stigma messages on depression; further, regarding image type, photographs should be considered over cartoons as they are more effective in eliciting certain anti-stigma outcomes.

## IMPLICATIONS FOR PRACTICE

This study suggests that images have strong anti-stigma effects and that

photographs are sometimes more persuasive than cartoons. These findings can inform best-practice guidelines for designing anti-stigma messages, created and disseminated by organisations such as the United States' National Alliance on Mental Illness and Mental Health America.

Images in these messages should be selected carefully as they can influence how people with mental illness are perceived and treated.

## **KEYWORDS**

Mental illness; stigma; narrative; photograph; cartoon; images

## **Introduction**

Public stigma against mental illness is a social construct that triggers negative affective and cognitive reactions, such as fear and responsibility attributions, respectively, against people with these disorders; this results in individual and structural discrimination, which in turn severely hampers treatment and recovery (Link & Phelan, 2001, 2013). Anti-stigma strategies include mediated contact with individuals with mental illness via narratives and reducing individual responsibility by highlighting the socio-environmental determinants (not individual determinants) that contribute to the cause and successful treatment of these disorders (e.g. Niederdeppe, Bu, Borah, Kindig, & Robert, 2008; Oliver, Dillard, Bae, & Tamul, 2012). Thus far, anti-stigma message design has focussed heavily on text-based messages; there is limited information on what types of images are most persuasive in eliciting anti-stigma outcomes. Images commonly seen in anti-stigma materials are photographs and cartoons. For example, the United States' largest grassroots mental health organisation, the National Alliance on Mental Illness (2020), uses photographs in its 'StigmaFree' campaign materials. Cartoons, which have long been used in public health messages (Schneider, 2014), can be found in Mental Health America's #mentalillnessfeelslike campaign (Strutner, 2016), in news stories on mental health issues (e.g. Zucker & Alexander-Tanner, 2017), and various graphic novels/comics on mental illness (e.g. Forney, 2012). However,

it is not known how such images of varying realism, from concrete at the realistic end (e.g. photographs) to abstract (e.g. cartoons) at the distilled end (Medley & Haddad, 2011), influence anti-stigma outcomes. This is important to study because the type of image used to depict an illness can influence how the illness is perceived, which in turn can affect how people with the illness are treated (Williams, 2012).

Informed by the stigma communication model (Smith, 2007), narrative persuasion (e.g. Green & Brock, 2000; Hinyard & Kreuter, 2007), the social determinants of health (e.g. Niederdeppe et al., 2008), and the realism continuum in illustrations (Dwyer, 1972, 1979; McCloud, 1993, Medley & Haddad, 2011), this study extends the literature on the design of anti-stigma messages by investigating, via a randomised online experiment, whether mental illness narratives about depression illustrated with photographs are more effective than those illustrated with cartoons at reducing stigma. Depression was chosen as it is a common mental disorder and a leading cause of disability worldwide, according to the World Health Organization (2020).

### ***Narratives, images and anti-stigma effects***

A narrative format was used for the anti-stigma messages designed for this study as they have been found to be more effective than non-narratives at inducing identification with and compassion towards stigmatised individuals (Chang, 2008; Tal-Or & Cohen, 2010). Narratives are also associated with favourable behavioural intentions towards stigmatised groups, like support for health policy (Niederdeppe, Heley, & Barry, 2015), decreased social distancing intention (Caputo & Rouner, 2011), and increased helping intention, like donating money (Oliver et al., 2012). Further, to shift attributions of responsibility for both the cause and treatment of mental illness away from individuals and towards society, and thereby reduce stigma (e.g. Bos, Pryor, Reeder, & Stutterheim, 2013; Link & Phelan, 2013), the social determinants of mental illness (Fisher & Baum, 2010) were made salient in these narratives. Attribution of responsibility to social forces (instead of individual factors) elicits more sympathy towards depressed individuals (Lee et al., 2019).

We expected anti-stigma effects to be greater for the illustrated than the non-illustrated (control) narratives, given the pictorial superiority effect (Nelson, Reed, & Walling, 1976) and research that has found beneficial effects of images, such as improving recall (Houts, Doak, Doak, & Loscalzo, 2006), increasing attention (Hall et al., 2015), enhancing understanding of complicated material (Kim et al., 2013), and improving perceptions of disease severity and efficacy (Chang, 2013).

Based on the literature reviewed above, we hypothesised that participants in the illustrated conditions (compared to the non-illustrated condition/ control) will report more identification (Hypothesis 1a (H1a)) and closeness (H1b) with the protagonist and less pity (H1c) and prejudicial feelings (H1d) towards the protagonist. We also hypothesised that identification and closeness with the protagonist will be positively associated with mental health policy support (H2a) and donation behaviour (H2b) and negatively associated with personal responsibility attributions (H2c), social distancing intention (H2d), and coercion-segregation intention (H2e). Further, we predicted that pity and prejudicial feelings towards the protagonist will be positively associated with personal responsibility attributions (H3a), social distancing intention (H3b), and coercion-segregation intention (H3c) and negatively associated with mental health policy support (H3d) and donation behaviour (H3e).

Further, given that messages with images are more likely to be shared on social media (Strekalova & Krieger, 2017; Vos & Sutton, 2016), we proposed that participants will be more likely to disseminate the illustrated narratives than the non-illustrated narrative (control) (H4).

### ***Photographs versus cartoons***

Narratives in this study were illustrated with images of varied realism, specifically, photographs (concrete, detailed) or cartoons (abstract, simplistic). Research indicates that both photos and cartoons influence cognition, emotion and behaviour, sometimes in similar ways. For example, while photos increase the perceived credibility of a story as readers believe that they offer authentic, true accounts of events (Lowrey, 1998), they do not significantly increase the credibility of a

news story compared to other types of images (Gruber & Dickerson, 2012). Also, photographs of victims foster emotional connection and empathy (Konstantinidou, 2008), and photos of sad subjects are associated with sympathetic reactions and willingness to donate to charitable organisations (Baberini, Coleman, Slovic, & Västfjäll, 2015). With regard to mental illness, photographs depicting recovery rather than suffering are more likely to elicit help-seeking behaviour (Sontag, 2018). Further, depression fotonovelas are more effective at reducing stigma towards antidepressant use and receiving mental health care than text-only pamphlets (Unger, Cabassa, Molina, Contreras, & Baron, 2013).

Cartoons have long been used in health education (e.g. Delp & Jones, 1996). Abstract illustrations like cartoons promote learning of complex concepts better than realistic illustrations because they focus attention on relevant aspects of a problem and do not contain distracting information (Mason, Pluchino, Tornatora, & Ariasi, 2013). Cartoons also enhance learning by integrating text and images (Mayer, 2003). Further, while realistically drawn characters 'objectify' the characters and emphasise 'their other-ness from the reader', simply drawn characters, as in cartoons, 'assist in reader identification' (McCloud, 1993, p. 44). Cartoons also make visible abstract phenomena: Thought bubbles in cartoons portray the world within an individual (Jee & Anggoro, 2012; McCloud, 1993), and visual metaphors convey intangible concepts. Cartoons use personification, which helps readers relate to characters in a narrative and become emotionally attached to them (Alesandrini, 1984; McNicol, 2014).

Against the backdrop of this prior work, and given the lack of clear evidence regarding the persuasive influence of photographs over cartoons or vice versa, we proposed the following research question (RQ1): Will there be a significant difference between the depression narratives with photos versus those with cartoons with regard to perceived story credibility (RQ1a) as well as identification (RQ1b), closeness (RQ1c), pity (RQ1d), and prejudicial feelings (RQ1e) towards the story protagonist?

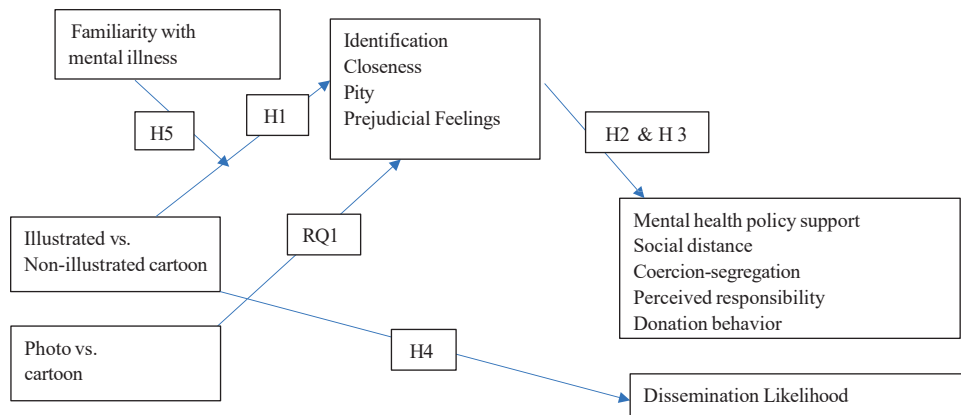


Figure 1. Conceptual model of relationships between variables proposed in the hypotheses and research questions.

### ***Personal experience with mental illness***

Research has found that people who have experienced contact with individuals with a mental illness are less likely to harbour stigmatising attitudes towards them (Holmes, Corrigan, Williams, Canar, & Kubiak, 1999). Based on this, we proposed that participants who have familiarity with mental illness will be more likely to identify with (H5a) and feel close to the story’s protagonist (H5b) and have less pity (H5c) and prejudicial feelings (H5d) for the protagonist than those without mental illness familiarity.

Figure 1 presents a conceptual diagram of the relationships between the variables described in the hypotheses and research questions.

### **Method**

The study used a 3 (image: photograph, cartoon, no image/control) x 1 (disease type: depression) between-subjects design. Participants ( $n = 162$ ), recruited via the Amazon Mechanical Turk website, were randomly assigned to read online a fictional news narrative on depression with (1) text only (control), or (2) text with photos, or (3) text with cartoons. The study was approved as exempt research by the institutional review board (IRB project number: 2006656) of the University of Missouri, Columbia, Missouri, United States. Informed consent was obtained from all participants. Participants were 79% white, 54.3% male, 19

to 59-years-old ( $M = 33.44$ ,  $SD = 8.75$ ). Other sample characteristics were as follows: 42.6% had a college degree; 50% had never been married; 42.6% identified as Democrat, 39.5% as Independent, and 15.4% as Republican; and 56.2% of the sample had a household income between \$25,000 and \$75,000. The average study completion time was 11.35 min.

### ***Stimuli***

In all three conditions, the text was identical and consisted of a fictional news narrative (800–1000 words; modelled on published stories on mental illness) on depression that described the symptoms, diagnosis, and treatment of the protagonist (Eliza Smith).

The narrative was illustrated with photographs or cartoons. The photographs, all black and white, were taken by a photojournalist on the campus of a midwestern university in the United States. Two undergraduate female students at this midwestern university and the author served as models for story characters. (The students signed a photo release consent form authorising the use of images in research studies, publications, and presentations.) The image of an MRI scan showing differences in activity levels between a brain with and without depression, was based on an image obtained with permission from the Mayo Foundation for Medical Education and Research, all rights reserved.

The cartoons were operationalised as follows: similar to the photographs but simplistic, devoid of detail, and depicting the inner emotions/thoughts of the story characters through visual metaphors and personification. The cartoons were based on the photographs in the corresponding photo version of the story and were created by a graphic designer. To ensure that the cartoons were similar to their corresponding photographs from which they were derived, a sample of MTurk adults was presented with pairs of images, and then asked to rate (on a scale of 1–5; 1, strongly disagree; 5, strongly agree) nine statements on image similarity (e.g. ‘The photograph and cartoon visually resemble each other’; ‘The cartoon shows what the person is feeling or thinking’). Most participants agreed that the images were visually similar ( $M = 3.99$ ,  $SD = 0.41$ ), of the same size ( $M = 4.36$ ,  $SD = 0.37$ ),



depicted the same event ( $M = 4.02$ ,  $SD = 0.43$ ), and that the placement of people in both images was similar ( $M = 4.14$ ,  $SD = 0.52$ ). Further, most participants agreed that the cartoons ( $M = 4.0$ ,  $SD = 0.62$ ) showed what the person was thinking/feeling whereas the photographs did not ( $M = 2.54$ ,  $SD = 0.56$ ). This difference was significant ( $t(86) = 11.51$ ,  $p < 0.01$ ). See Supplementary material for the stimuli.

### ***Dependent variables***

#### **Message credibility**

Based on Appelman and Sundar (2016), message credibility was measured by asking participants to rate (1, strongly disagree; 7, strongly agree) how well the following adjectives described the story content: 'accurate, authentic, and reliable' ( $\alpha \geq 0.83$ ).

#### **Identification**

Drawing on Tal-Or and Cohen (2010), identification was measured by asking participants to rate five items (1, strongly disagree; 7, strongly agree) such as: 'I understand the events in the story the way Eliza understood them' ( $\alpha \geq 0.87$ ).

#### **Prejudicial feelings**

Drawing on Ramasubramanian (2010), participants' prejudicial feelings were assessed by asking them to what extent the following adjectives described their feelings towards the story's protagonist: 'discomfort, nervousness, disgust, dislike, fear, and anger' (1, strongly disagree; 7, strongly agree) ( $\alpha \geq 0.88$ ).

#### **Closeness**

Drawing on Oliver et al. (2013), participants were asked to what extent the following adjectives described their feelings towards the story's protagonist: 'closeness, caring, connection, compassion' (1, strongly disagree; 7, strongly agree) ( $\alpha \geq 0.83$ ).

#### **Pity**

Drawing on Oliver et al. (2013), participants were asked to what extent the following adjectives described their feelings towards the story's protagonist: pity, 'sympathy, sorry for, worried for' (1, strongly disagree; 7, strongly agree) ( $\alpha \geq 0.74$ ).

### ***Personal responsibility beliefs***

Drawing on Corrigan, Markowitz, Watson, Rowan, and Kubiak (2003), participants' personal responsibility beliefs regarding mental illness were measured by asking them to rate three items such as: 'I think people with depression have themselves to blame for their illness (1, strongly disagree; 7, strongly agree)' ( $\alpha \geq 0.75$ ).

### ***Social distance***

Drawing on Link, Cullen, Frank, and Wozniak (1987), social distancing intention was assessed by asking participants to rate seven items such as: 'If you were a landlord, would you rent out an apartment to someone with depression?' (1, strongly unwilling; 7, strongly willing). Higher values indicate *lower* social distancing behaviour ( $\alpha \geq 0.89$ ).

### ***Coercion-segregation***

Drawing on Corrigan et al. (2003), coercion-segregation towards the story's protagonist was assessed by asking participants to rate four items such as 'I think Eliza poses a risk to her neighbors unless she is hospitalized' ( $\alpha \geq 0.95$ ).

### ***Mental-health policy support***

Drawing on Barry, McGinty, Pescosolido, and Goldman (2014), this variable was measured by asking participants to rate four items such as: 'Do you favor or oppose requiring insurance companies to offer benefits for the treatment of mental illness that are equivalent to benefits for other medical services?' (1, strongly oppose; 7, strongly favor) ( $\alpha \geq 0.83$ ).

### **Dissemination likelihood**

Drawing on Smith (2012), participants' likelihood of sharing the message was assessed by asking participants the following three questions: 'How likely would you be to share this message with: family, close friends, colleagues/classmates/ coworkers' (1, not likely; 5, very likely; 6, not applicable) ( $\alpha \geq 0.92$ ).

### **Donation**

As a behavioural measure, participants were asked the following questions: 'Are you willing to donate some portion of your MTurk earnings from this study to fund mental health services?' (1, yes; 2, no) 'If yes, how much (range, \$0.1 to \$2)'. Regardless of how they responded to this question, no money was actually deducted from participants' compensation (\$2.00).

**Table 1.** ANOVA results.

Variable	Text M (SD)	Photo M (SD)	Cartoon M (SD)	$F_{(df)}$	$\eta^2$	Post-hoc
Credibility (M = 6.02, SD = 0.87)	5.72 (0.97)	6.14 (0.85)	6.19 (0.72)	4.94 (2, 159)*	0.06	t vs. p, t vs. c
Identification (M = 5.21, SD = 1.17)	4.87 (1.34)	5.52 (1.01)	5.25 (1.06)	4.25 (2, 158)*	0.05	t vs. p
Prejudicial feelings (M = 1.78, SD = 1.13)	2.0 (1.25)	1.51 (0.95)	1.8 (1.13)	2.07 (2, 149)	0.03	n.s.
Closeness (M = 5.07, SD = 1.33)	4.61 (1.55)	5.66 (1.08)	5.0 (1.12)	9.55 (2, 159) <sup>†</sup>	0.11	t vs. p, p vs. c
Pity (M = 4.94, SD = 1.30)	4.61 (1.57)	5.20 (1.08)	5.00 (1.15)	2.88 (2, 159)	0.04	n.s.
Personal responsibility beliefs (M = 2.49, SD = 1.23)	2.69 (1.21)	2.25 (1.20)	2.53 (1.27)	1.77 (2, 159)	0.02	n.s.
Social distance (M = 5.48, SD = 1.13)	5.28 (1.29)	5.56 (1.09)	5.61 (0.97)	1.38 (2, 159)	0.02	n.s.
Coercion segregation (M = 1.74, SD = 1.26)	1.82 (1.28)	1.81 (1.41)	1.59 (1.06)	0.60 (2, 159)	0.01	n.s.
Mental health policy support (M = 5.62, SD = 1.15)	5.33 (1.22)	5.84 (1.05)	5.68 (1.15)	2.75 (2, 159)	0.03	n.s.
Dissemination likelihood (M = 3.33, SD = 1.34)	3.07 (1.32)	3.53 (1.42)	3.4 (1.26)	1.65 (2, 159)	0.02	n.s.
Donation behaviour (M = 1.78, SD = 0.42)	1.8 (0.41)	1.85 (0.36)	1.7 (0.47)	2.05 (2, 159)	0.13	n.s.

<sup>†</sup>Denotes ANOVAs with a statistically significant Levene's test for homogeneity of variance.

\* $p < 0.05$ .

### **Familiarity with mental illness**

Drawing on Holmes et al. (1999), the index for this variable (which was measured before stimulus exposure) was the rank score of the situation that described participants' closest degree of contact with persons with mental illness (e.g. 'I have a relative who has a mental illness' (score: 10)). Because the variable reflected a bimodal distribution, we used a median split: Scores below 9 were coded as not living with someone with a mental illness; scores above 9 as living with someone with a

mental illness (henceforth, 'lived with mental illness' and 'lived without mental illness', respectively).

### ***Open-ended questions***

In the illustrated conditions, participants were asked to list at least 3 thoughts about the images in the story they had just read.

### **Results**

There was a significant difference between the three groups (photo, cartoon, and text (control)) with regard to perceptions of message credibility. Participants who saw the photo ( $M = 6.14$ ,  $SD = 0.85$ ) or cartoon narrative ( $M = 6.19$ ,  $SD = 0.72$ ) reported more credibility than those who saw the text-only version ( $M = 5.72$ ,  $SD = 0.97$ ) ( $F(2,159) = 4.94$ ,  $p = 0.008$ ) (RQ1a). Tukey's post-hoc analyses revealed significant differences in perceived credibility between the text and photo ( $p = 0.03$ ) and text and cartoon narratives ( $p = 0.013$ ) (RQ1a). However, there was no significant difference in perceived credibility between the photo and cartoon narratives ( $p = 0.96$ ). (RQ1a). See Table 1 for ANOVA results.

To test H1–H5 and to investigate RQ1b–RQ1e, we set up a structural equation model using M-Plus ver 6.1 (Muthén & Muthén, 2011). We first controlled for the shared associations between all of the outcome variables. (See Table 2 for the zero-order correlations between the variables). In the first model, we tested the influence of the experimental manipulation by modelling the non-illustrated vs. illustrated and photo vs. cartoon contrasts on all of the outcomes simultaneously. H4 was not supported: There was no significant difference between the illustrated and non-illustrated narrative conditions with regard to message dissemination likelihood. However, there were two not hypothesised, but notable effects. First, mental health policy scores were significantly higher among those presented with an illustrated narrative as opposed to the non-illustrated narrative (control) ( $b = 0.57$ ,  $SE = 0.26$ ,  $z = 2.18$ ,  $p < 0.05$ ). Moreover, donate scores were significantly higher among those presented with the photographic narrative as opposed to the cartoon narrative ( $b = 0.08$ ,  $SE = 0.04$ ,  $z = 1.99$ ,  $p < 0.05$ ).

In the full model, we tested for the effects of the experimental manipulation on the potential mediators (identification, closeness, pity and prejudicial feelings). Identification and closeness scores were significantly higher among those presented with an illustrated narrative as opposed to the non-illustrated narrative (control) (Identification:  $b = 0.93$ ,  $SE = 0.35$ ,  $z = 2.64$ ,  $p < 0.05$ ; Closeness:  $b = 0.94$ ,  $SE = 0.31$ ,  $z = 3.02$ ,  $p < 0.05$ ). Thus, both H1a and H1b were supported. H1c, however, was contradicted: Pity scores were significantly higher (instead of lower) among those presented with an illustrated narrative as opposed to non-illustrated narrative (control) ( $b = 0.65$ ,  $SE = 0.32$ ,  $z = 2.07$ ,  $p < 0.05$ ). There was no significant difference in prejudicial feelings between those presented with an illustrated narrative and the control (text-only); thus, H1d was not supported.

**Table 2.** Correlation matrix.

	1	2	3	4	5	6	7	8	9	10
1. Identification		0.68**	0.34**	-0.17*	0.44**	0.16*	0.31**	-0.16*	-0.20**	-0.04
2. Closeness	0.68**		0.56**	-0.26**	0.39**	0.27**	0.24**	-0.17*	-0.20*	-0.11
3. Pity	0.34**	0.56**		-0.02	0.21**	0.00	0.09	-0.07	-0.10	-0.15
4. Prejudicial feelings	-0.17*	-0.26**	-0.02		-0.32**	-0.48**	-0.13	0.42**	0.06	0.51**
5. Mental health policy support	0.44**	0.39**	0.21**	-0.32**		0.37**	0.37**	-0.35**	-0.19*	-0.32**
6. Social distance	0.16*	0.27**	0.00	-0.48**	0.37**		0.10	-0.50**	-0.22**	-0.34**
7. Dissemination likelihood	0.31**	0.24**	0.09	-0.13	0.37**	0.10		-0.10	-0.18*	-0.14
8. Perceived responsibility	-0.16*	-0.17*	-0.07	0.42**	-0.35**	-0.50**	-0.10		0.05	0.43**
9. Donation behaviour	-0.20**	-0.20*	-0.10	0.06	-0.19*	-0.22**	-0.18*	0.05		0.03
10. Coercion segregation	-0.04	-0.11	-0.15	0.51**	-0.32**	-0.34**	-0.14	0.43**	0.03	

\*Correlation is significant at the 0.05 level (2-tailed); \*\*correlation is significant at the 0.01 level (2-tailed).

There was no significant difference in identification or pity or prejudicial feelings between those presented with a photographic narrative versus a cartoon narrative (RQ1b, RQ1d, RQ1e). However, closeness scores were significantly higher among those presented with a photographic narrative as opposed to a cartoon narrative ( $b = 1.39$ ,  $SE = 0.42$ ,  $z = 3.32$ ,  $p < 0.05$ ) (RQ1c).

We simultaneously examined the effects of the mediators on the outcomes. Identification was positively associated with mental health policy support ( $b = 0.29$ ,  $SE = 0.07$ ,  $z = 4.18$ ,  $p < 0.05$ ); H2a was partially supported. Identification and closeness were not associated with donation behaviour; thus, H2b was not supported. Closeness was significantly associated with lowered social distancing intention (higher values on social distancing indicate lower social distancing intention) ( $b = 0.29$ ,  $SE = 0.13$ ,  $z = 2.19$ ,  $p < 0.05$ ); thus, H2d was partially supported. Identification and closeness were not negatively associated with personal responsibility attributions or coercion-segregation; thus, H2c and H2e were

not supported. A non-hypothesised finding was that identification was positively associated with message dissemination likelihood ( $b=0.21$ ,  $SE = 0.05$ ,  $z = 4.62$ ,  $p < 0.05$ ).

Prejudicial feelings but not pity were significantly positively associated with personal responsibility attribution ( $b=0.21$ ,  $SE = 0.05$ ,  $z = 4.62$ ,  $p < 0.05$ ); thus, H3a was partially supported. Pity and prejudicial feelings were negatively related with social distancing intention (higher values indicate lower social distancing behaviour) (pity:  $b = -0.25$ ,  $SE = 0.10$ ,  $z = -2.10$ ,  $p < 0.05$ ; prejudicial feelings:  $b = -0.50$ ,  $SE = 0.10$ ,  $z = -4.47$ ,  $p < 0.05$ ); H3b was supported. Pity or prejudicial feelings were not associated with coercion-segregation; thus, H3c was not supported. Prejudicial feelings, but not pity, was negatively associated with mental health policy support. Thus H3d was partially supported ( $b = -0.15$ ,  $SE = 0.05$ ,  $z = -3.19$ ,  $p < 0.05$ ). Pity and prejudicial feelings were not associated with donation behaviour; thus, H3e was not supported.

Given that the dependent variable of coercion segregation was not significantly different across conditions nor significantly associated with any of the mediators, it was dropped from the subsequent analyses.

We tested for the indirect effect of the experimental manipulation on mental health policy support, social distancing intention, dissemination likelihood, personal responsibility attribution, and donation behaviour via identification, closeness, pity, and prejudicial feelings (Figure 2). Nonsignificant paths were trimmed from the model for parsimony. Two significant indirect effects were observed: There was a significant difference with regard to mental health policy scores as well as message dissemination likelihood between those that received the illustrated narrative versus those that received the non-illustrated narrative (control) and this effect was indirectly through identification (mental health policy: indirect effect = 0.09,  $SE = 0.04$ ,  $z = 2.24$ ,  $p < 0.05$ ; message dissemination likelihood: indirect effect = 0.08,  $SE = 0.03$ ,  $z = 2.31$ ,  $p < 0.05$ ).

To test H5, we split the model as a function of whether the participants were familiar with mental illness or not. This allowed us to constrain each individual path in the model across both groups to be identical. It's worth noting that we also ran

independent samples *t*-tests to compare differences for all of the study variables among subjects who had lived with or without someone with a mental illness (see Table 3 for zero-order correlations). One difference, that was not hypothesised, emerged: With regard to social distancing behaviour, individuals who lived with someone with a mental illness ( $M = 5.71$ ,  $SD = 1.11$ ) exhibited significantly lower social distancing behaviour than those who had not lived with someone with a mental illness ( $M = 5.17$ ,  $SD = 1.08$ ;  $t(153) = -2.97$ ,  $p < 0.05$ ).

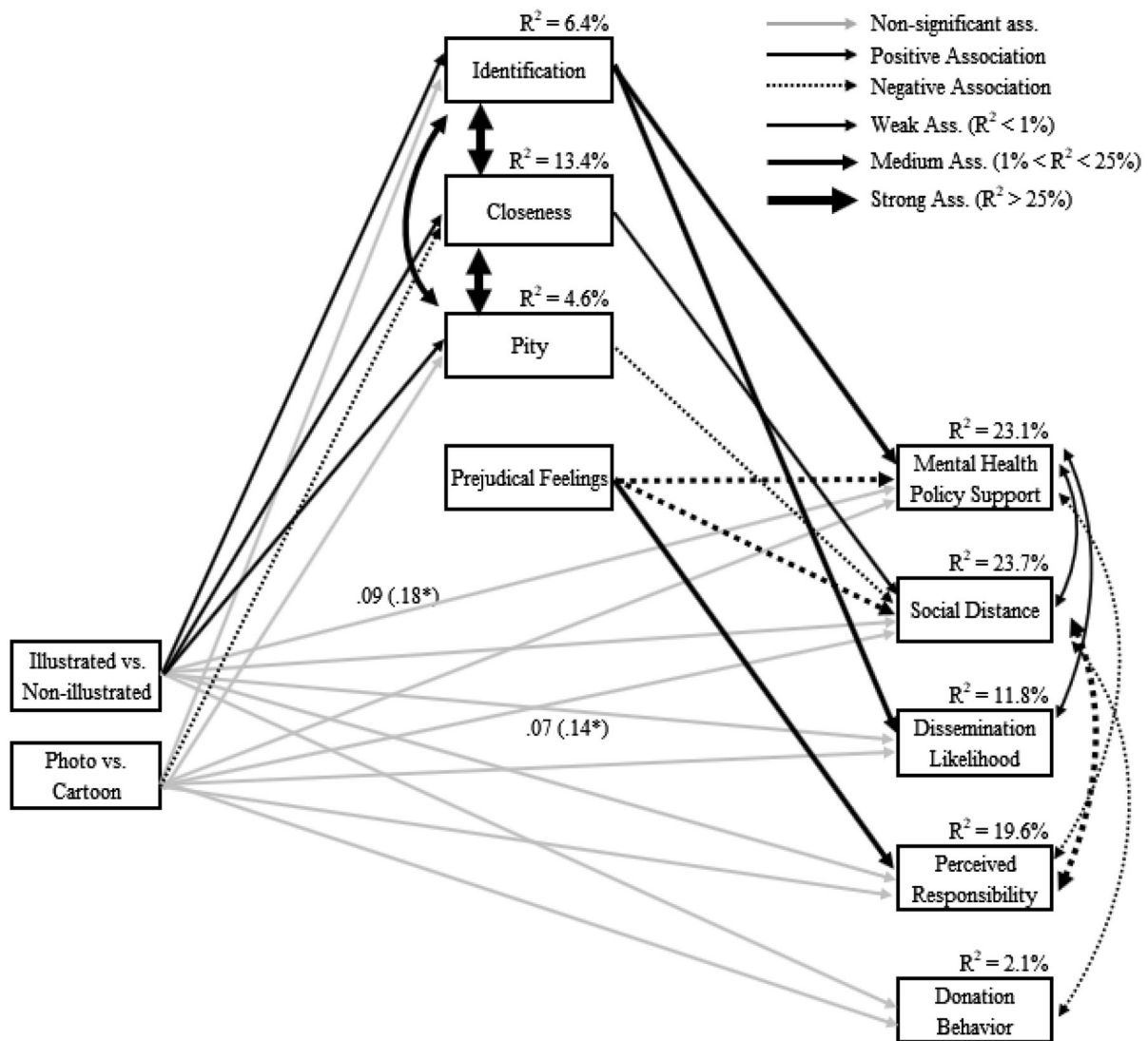
The multi-group comparison model only differentiates between the paths that significantly worsened the model fit (as tested by a significant increase in the  $\chi^2$  statistic). There were three effects that significantly worsened the model when they were constrained to be the same across groups. Namely, among subjects who had lived with someone with a mental illness, those exposed to the illustrated narratives reported significantly more identification ( $b = 1.61$ ,  $SE = 0.43$ ,  $z = 3.76$ ,  $p < 0.05$ ), closeness ( $b = 1.56$ ,  $SE = 0.43$ ,  $z = 3.61$ ,  $p < 0.05$ ), and pity ( $b = 1.38$ ,  $SE = 0.44$ ,  $z = 3.16$ ,  $p < 0.05$ ) than those exposed to the non-illustrated narrative/control, where the effects were not significant; thus, H5a, H5b, and H5c were supported.

A textual comparison of the open-ended responses indicated that participants in the photo condition were more than twice as likely to describe the photos as eliciting closeness (by using words such as ‘humanizing’, ‘touching’ and ‘empathetic’ than as educational (by using words such as ‘learning’, ‘focus attention’). In the cartoon condition, cartoons were described as both explanatory and as eliciting empathy.

**Table 3.** Correlation matrix for living without mental illness condition (above the diagonal) and with mental illness (below the diagonal).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	1.
1. Identification		0.79**	0.37**	-0.13	0.40**	0.21	0.27*	-0.21	-0.18	0.06
2. Closeness	0.66**		0.66**	-0.21	0.45**	0.34**	0.26*	-0.27*	-0.24	-0.02
3. Pity	0.38**	0.51**		<0.01	0.28*	0.09	0.10	-0.13	-0.13	-0.02
4. Prejudicial feelings	-0.24*	-0.28**	0.03		-0.44**	-0.57**	-0.18	0.39**	0.19	0.72**
7. Mental health policy support	0.46**	0.37**	0.20	-0.21		0.50**	0.23	-0.35**	-0.12	-0.32**
8. Social distance	0.08	0.21	-0.07	-0.47**	0.31**		0.05	-0.53**	-0.27*	-0.29*
9. Dissemination likelihood	0.36**	0.27*	0.15	-0.17	0.47**	0.16		-0.03	-0.17	-0.07
10. Perceived responsibility	-0.13	-0.15	-0.09	0.53**	-0.35**	-0.54**	-0.13		0.07	0.39**
11. Donation behaviour	-0.23*	-0.17	-0.09	0.06	-0.26*	-0.24*	-0.20	0.08		0.13
12. Coercion segregation	-0.11	-0.15	-0.19	0.42**	-0.33**	-0.38**	-0.22*	0.48**	0.04	

\*Correlation is significant at the 0.05 level (2-tailed); \*\*correlation is significant at the 0.01 level (2-tailed).



$\chi^2_{(21)} = 29.25, p > .05, CFI = .98, RMSEA = .05, SRMR = .07$

Figure 2. Model of the association between the manipulation and all dependent variables, including the indirect effects of the mediators. Values in parentheses reflect the direct association without the mediators included in the model.

## Discussion

Given that mental illness stigma hampers treatment, and the limited focus in anti-stigma message design on images (despite their potential to influence disease perception and treatment (Williams, 2012)), we investigated what type of images – cartoons or photographs – were most effective at reducing stigma.

Overall, image type did not elicit differential effects, except in the following cases: Those presented with a photographic narrative compared to a cartoon narrative reported more closeness with the protagonist and a greater willingness to



donate to mental health services. Participants' open-ended responses appear to echo these results: Those in the photo condition were more likely to indicate that the photos helped them identify with and feel compassion for the protagonist. This is noteworthy as stereotypical pictorial depictions of mental illness, for example, 'wild, unkempt hair; tattered clothing', have often acted as a 'symbolic boundary' between those with and without mental illness, thereby providing reassurance that those with mental illness are different from ourselves (Cross, 2004, p. 199). The anti-stigma photographs in this study did the opposite: They helped the participants see the protagonist, and by extension, those with depression, not as others, but as themselves.

Overall, images, whether photo or cartoon, produced more anti-stigma effects than the text-only narrative control. Participants exposed to illustrated narratives reported more identification, closeness, and pity. They also reported more support for mental health policy and were more likely to disseminate the message; these effects were mediated via identification with the protagonist. This finding supports previous research that shows that those who identify with individuals with mental illness are more likely to support government spending for mental health (McSween, 2002) and that messages with images are more likely to be shared (Strekalova & Krieger, 2017). Further, those exposed to an illustrated narrative perceived the message to be more credible. Even among those who had familiarity with mental illness, exposure to the illustrated narrative resulted in significantly more identification, closeness, and pity than exposure to the text-only narrative. Taken together, images produced relatively stronger effects than text alone, as per previous research (Gibson & Zillmann, 2000).

The findings contribute to research on illness iconography, stigma communication, and narrative persuasion. The findings distinctly suggest that images enhance the persuasive potential of anti-stigma illness narratives compared to text-only narratives. Further, anti-stigma effects vary by image type: A photographic narrative on depression was perceived as humanising and evoked more closeness than a cartoon narrative, which in turn led to pro-social behaviour, specifically, more likelihood to donate to mental health causes.

## **Limitations and future research**

Since we focussed on only one type of mental illness, namely, depression, the findings have limited generalisability. Future studies should examine the anti-stigma effects of illustrated narratives about other types of mental illness. Also, further research is needed to determine under which boundary conditions do images of varying realism exert anti-stigma effects.

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No potential conflict of interest was reported by the author(s).

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