Revisiting stigma attributions and reactions to stigma:   
Replication and extensions of Weiner et al. (1988)

(Version: 2)

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Gilad Feldman guided and led the replication efforts in the course PSYC7308 Dissertation in Psychology. Gilad supervised each step in the project, conducted the pre-registrations, and ran data collection

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|  |  |  |
| --- | --- | --- |
| **Role** | **Kwan Yin Gladys Yeung** | **Gilad Feldman** |
| Conceptualization | V | V |
| Pre-registration | V |  |
| Data curation |  | V |
| Formal analysis | V |  |
| Funding acquisition |  | V |
| Investigation | V |  |
| Pre-registration peer review / verification |  | V |
| Data analysis peer review / verification |  | V |
| Methodology | V |  |
| Project administration |  | V |
| Resources |  |  |
| Software | V |  |
| Supervision |  | V |
| Validation |  | V |
| Visualization | V |  |
| Writing-original draft | V |  |
| Writing-review and editing |  | V |

# Abstract

[IMPORTANT:   
Method and results were written using a randomized dataset produced by Qualtrics to simulate what these sections will look like after data collection. These will be updated following the data collection. For the purpose of the simulation, we wrote things in the past tense, but no pre-registration or data collection took place yet.]

Weiner et al. (1988) found that compared to mental-behavioral stigmas, physically-based stigmas were perceived as less controllable, more stable (irreversible) and were therefore associated with more pity and liking, less anger, and more willingness to help. We conducted a pre-registered replication and extension of Experiment 2 by Weiner et al. (1988) with an American online Amazon Mechanical Turk sample (*N* = 800). Our replication [failed to find/found] support for the original findings on the associations between stigma origin (i.e., mental-behavioral or physically-based), stability, emotional reactions (i.e., sympathy, liking, and anger), and willingness to help [summary effect sizes + CIs will be added here]. Extending the replication, we tested the model for four new stigmas prevalent in the last decade and reassessed the original’s categorizations of stigmas sources. Overall, participants’ categorizations of stigmas by source [matched/did not match] with the original’s, and we [found/failed to find] support for the relationship between stigma source and the attribution-affect-help judgment model. Materials, data, and code are available on the OSF: <https://osf.io/gwcbt/>.

*Keywords:* Attribution-affect-help judgment model, judgment and decision making, registered replication, controllability, stability, stigma

# PCIRR-Study Design Table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Question | Hypothesis | Sampling plan | Analysis plan | Interpretation given different outcomes | Theory that could be shown wrong by the outcomes |
| How is stigma source associated with perceived controllability and stability, emotional reactions, and willingness to help? | Compared to mental-behavioral stigmas, physically-based stigmas were perceived as less controllable, more stable (irreversible), and were therefore associated with more sympathy, less anger, and more willingness to help. | We aimed to recruit 800 participants, several times larger than the required sample size suggested by the power analysis based on the target article (240). | We followed the same data analysis methods as the original study and added extensions and exploratory analyses to explore new directions. | Based on the criteria used by Lebel et al. (2019), we examine the replicability of findings from Weiner et al. (1988) and support for our extensions. | The attribution-  affect-help judgment model |
|

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# Revisiting stigma attributions and reactions to stigma: Replication and extensions of Weiner et al. (1988)

## Background

Would people rather donate to blind people or people with obesity? Why do people extend help to some stigmatized groups but not to others? Blindness and obesity seem to be perceived differently and have differing associated stigmas, impacting people’s reactions towards these groups and the willingness to help them.

Public stigmas are negative social reactions to perceived deviations from the norm (Jones et al., 1984) and are connotative of negative outcomes, or undesirable, debilitating conditions (Goffman, 1963; Weiner et al., 1988). Many factors influence helping behavior towards others in need, and one of the major determinants is the perceived cause of the need for help (Weiner, 1986). Weiner et al. (1988) examined how observers’ attributions regarding the causes of stigmatized characteristics were associated with their perceptions regarding stigma controllability, their affective reactions, and their subsequent help-giving tendencies. Weiner et al. (1988) also investigated how perceptions of stigma causes were associated with observers’ perceived stability of a stigma, or expectations regarding whether individuals could recover from their condition. They found that stigmas were commonly perceived to have somatic (physical) origins, compared to stigmas perceived as having mental-behavioral origins, were thought of as more onset-uncontrollable and stable, and elicited more pity and liking, less anger, and more inclinations to help. This paradigm was later summarized as the attribution-affect-help judgment model (Weiner, 1995).

In Weiner et al. (1988), the list of physically-based stigmas included attributes typically thought to be “determined” by genetic and environmental forces beyond personal control, such as blindness and Alzheimer’s disease. Their list of mental-behavioral stigmas included conditions typically associated with deviant acts that arise from an individual’s intentions, such as obesity, which is commonly thought to be caused by laziness (Jones & Davis, 1965; Maselli & Altrocchi, 1969; DeJong, 1980).

We conducted a close replication of Experiment 2 in Weiner et al. (1988) with two goals. Our first goal was to conduct an independent close replication regarding the influences of stigma attributions on affective reactions and help-giving tendencies. The second goal was to extend the replication by testing the robustness of the attribution-affect-help judgment model by using more comprehensive analyses and extending to testing new stigmas.

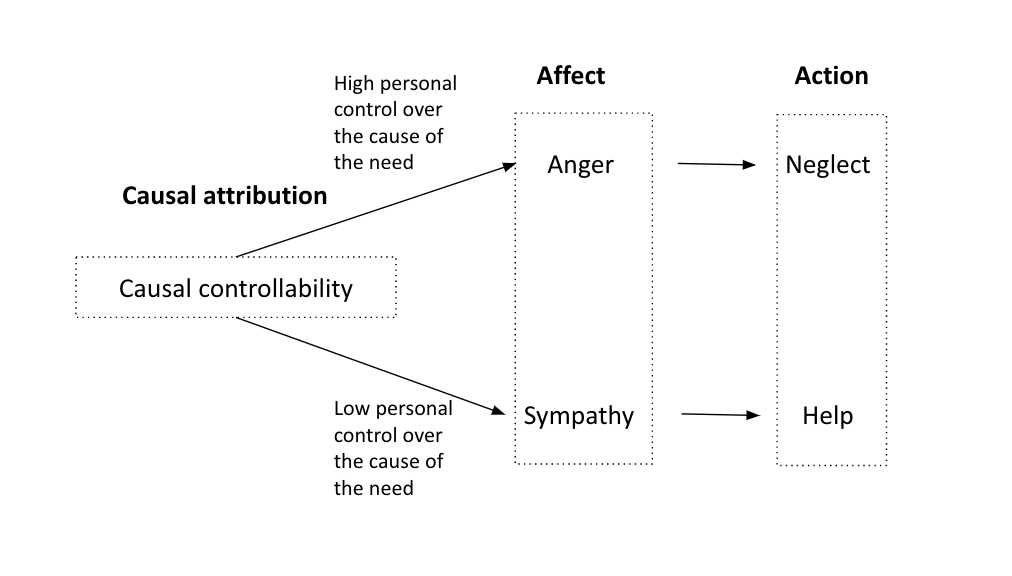
We begin by introducing the literature on the attribution-affect-help judgment model and the chosen article for replication. We then review the target article and introduce their hypotheses and study design, followed by our extensions.

## Attribution-Affect-Help Judgment Model

Attribution theory posits that people attribute causes to observed events or behavior, and the perceived causality of an outcome induces various affective reactions and behaviors (Weiner, 1986). Early studies by Barnes et al. (1979), Weiner (1980), and Brophy and Rohrkemper (1981) first investigated help-giving behavior through the lens of attribution theory. These studies demonstrated that causes perceived as controllable, compared to causes perceived as uncontrollable, led to less helping towards the individual in need. Barnes et al. (1979) further demonstrated that help-giving behavior increased when the perceived cause for help was thought to be stable.

Weiner (1986) proposed that perceived controllability is associated with affective reactions of pity and anger, which are associated with helping behavior. As the conceptualization of pity has changed since Weiner et al. (1988), and the literature has moved from discussing sympathy rather than pity, we used “sympathy” instead of “pity” in descriptions of our current replication and in our survey materials. Stability is often implicated in pity but not in sympathy, as seen from observers’ reactions to individuals with AIDS: pity is often a reaction to the terminal quality of AIDS, whereas sympathy is typically elicited by the perceived onset uncontrollability of the condition (Weiner, 1988, p.126). Moreover, pity is now characterized as a condescending form of feeling sorry towards people perceived as pathetic or responsible for their misery (Geller, 2006). On the other hand, sympathy is viewed as an expression of concern or sorrow towards distress in an individual’s life (Clark, 2010) and is more directly related to help-giving sentiments.

Thus, when an individual in need is perceived to be in control of their plight, observers tend to feel less sympathetic and angrier towards these individuals and expect them to take responsibility for helping themselves out of the perceived self-inflicted predicament. On the contrary, observers tend to sympathize and want to help those who cannot control the causes leading to their misfortune. We summarized the motivational sequence in Figure 1.   
 Follow-up studies arrived at similar conclusions, including conceptual replications (Cronan et al., 2016; Dijker & Koomen, 2003; Menec & Perry, 1998; Rush, 1998) and research focusing on specific sources of stigmas, such as obesity (Puhl et al., 2005), substance abuse (van Boekel et al., 2013; Brener et al., 2010; Strauser et al., 2009), and Alzheimer’s disease (Werner, 2005). A meta-analysis on help-giving behavior summarized support for the relationship between attributions, emotions, and help-giving judgments (Rudolph et al., 2004).



*Figure 1.* The attribution-affect-help judgment model (p. 197; Weiner, 1986)

## Choice of study for replication: Weiner et al. (1988)

We chose the article by Weiner et al. (1988) for replication based on several factors: impact, topic importance, absence of direct replications, and the potential for adding extensions to test the robustness of the phenomenon. First, the article has had much impact on scholarly research in social cognition, and judgment and decision-making. At the time of writing (June 2022), the article had more than 2400 citations according to Google Scholar, including prominent empirical studies and review articles of the associations between perceived controllability and affective reactions towards stigmas (Crocker & Major, 1989; Fiske et al., 2002; Goetz et al., 2010). A meta-analytic review by Rudolph et al. (2004) summarized 39 helping studies and showed general support for the theorized model and findings. Consistent with the theorized model and findings in Weiner et al. (1988), later studies showed that mental health or psychiatric disabilities are more heavily stigmatized than physical or other health conditions (Angermeyer, 2006; Corrigan et al., 2000; Thornicroft, 2006). To the best of our knowledge, there currently are no published independent direct pre-registered replications of the target article.

In addition to reassessing replicability and phenomenon robustness, our current study also aimed to reproduce the original article’s materials and address possible study design issues. We summarized the main reproducibility issues and our decisions to address them in Table 1. To illustrate, one of the issues we identified involved the scale of measurement. The original article stated that ratings for the dependent variables were made on a 9-point scale (meaning 0 to 8 or 1 to 9). However, some mean values for the original ratings on the ten stigmas were less than 1 and more than 8: mean ratings for the perceived responsibility and assistance on blindness in Experiment 1 were 0.9 and 8.5, respectively, in Table 1 (p.740). In Experiment 2, the mean ratings on perceived responsibility and pity for AIDS were 0.6 and 8.2, respectively, as shown in Table 5 (p. 746). Such indicated either a reporting error or that the original study used a 10-point scale that ranged from 0 to 9. We reached out to the authors to try and obtain the original materials, yet we received the reply that the exact materials have unfortunately been lost to time.

The original study had practical implications for healthcare and social welfare. Weiner et al. (1988) noted that associations between the perceived controllability of stigma onset and help-giving tendencies might lead to difficulties in soliciting public funding and support for mental health or behavioral issues and stigmatized populations. Several studies demonstrated that the perceived causality of stigmas was associated with fundraising outcomes (Berkowitz, 1975), patients’ treatment participation and adherence (Corrigan, 2004), and clinicians’ attitudes towards patients (Boekel et al., 2013). As the coverage and prevalence of the stigmas included in Weiner et al. (1988) may have changed since publication, revisiting the study allowed us to examine current public attitudes and social support for stigmatized individuals.

We aimed to revisit the classic phenomenon to examine the reproducibility and replicability of the findings with independent replications. Following the recent growing recognition of the importance of reproducibility and replicability in psychological science (Open Science Collaboration, 2012), we embarked on a well-powered, pre-registered close replication of Weiner et al. (1988).

Table 1

*Summary of methodological issues in the original with our design decisions*

|  |  |  |
| --- | --- | --- |
| Issue | Description | Our design decisions |
| Scale of measurement | The original article mentioned that ratings for the dependent variables were made on a 9-point scale (meaning 0 to 8 or 1 to 9). However, mean values for ratings on the ten stigmas in Experiment 1 (Table 1, p. 740) and Experiment 2 (Table 5, p. 746) were less than 1 and more than 8. This may indicate either a reporting error or that the original study used a 10-point scale ranging from 0 to 9. | We followed the text as is and used a 9-point scale from 0 to 8 on all ratings. |
| Nature of stigma | We identified one stigma in the original list - “child abuse” - described differently from the others. Individuals suffering from the other nine stigmas in the original article were commonly described as victims. However, “child abuse” was about the person who also perpetrated abuse rather than only its victim.   We discuss this in more detail in the methods section. | We added an exploratory analysis excluding the child abuse stigma item. |
| Randomization | The original article chose two fixed stigma display orders out of all possible stigma display combinations, thereby contrasting specific stigmas and not fully addressing order.  We discuss this in more detail in the methods section. | We randomized the display order of the stigmas. |
| Comparison between the control and experimental condition in Experiment 2 | The design in Experiment 2 manipulated controllability information in three conditions: 1) neutral control condition with no information on stigma onset controllability, 2) stigma controllability information and 3) stigma uncontrollability information to examine causal relationships between perceived controllability and affective reactions, along with help-giving behavior.  However, the researchers only contrasted the two information conditions (i.e., conditions #2 and #3) in testing associations between variables within the attribution-affect-help judgment model.  We discuss this in more detail in the methods section. | We added an exploratory analysis that compares differences between the three conditions: neutral, controllability, and uncontrollability. |

**Replication target’s experimental design, hypotheses, and findings**

Weiner et al. (1988) conducted two experiments to investigate the associations between perceptions of stigma origin (i.e., physical or mental-behavioral) and perceived controllability, affective reactions, and helping intent for stigmatized individuals. Experiment 2 tested for the same core hypotheses as Experiment 1, adding one hypothesis to test for the presumed causal relations between perceived controllability and the control-related variables (i.e., affective reactions and help-giving judgment). Our replications focused on the core hypotheses relating to the base theory. We did not seek to test associations with the instrumentality of intervention techniques, i.e., the usefulness of different methods in improving the life satisfaction of stigmatized individuals.

### Experiment 1: Baseline

In Experiment 1, Weiner et al. (1988) recruited 59 American college students and asked them to rate ten stigmas on the following dimensions: the perceived controllability of stigma onset (indexed by responsibility and blame), affective reactions of liking, pity, and anger towards individuals with a particular stigma, the perceived stability of the stigmas (indexed by changeability) and the perceived instrumentality of five intervention techniques (technical job training, professional job training, welfare, medical treatment, and psychotherapy).

Weiner et al. (1988) categorized the ten stigmas into physical or mental-behavioral in origin, with five stigmas per category. Physical stigmas included Alzheimer’s disease, blindness, cancer, heart disease, paraplegia, and Vietnam War syndrome. Mental behavioral stigmas included acquired immune deficiency syndrome (AIDS), child abuse, drug abuse, and obesity.

### Experiment 2: Controllability information manipulations

In Experiment 2, Weiner et al. (1988) aimed to examine the causality of the associations in Experiment 1 and manipulated information regarding the controllability of the stigmatized condition (*N* = 320).

Participants were American and Canadian college students, and they were randomly allocated to one of three conditions. Participants randomly assigned to the no information control condition (*n* = 112) answered questionnaires identical to that used in Experiment 1. Participants randomly assigned to one of the two information conditions (*n* = 208) received questionnaires indicating that stigma onset was either controllable or uncontrollable.

### Effect sizes of original findings

We summarized the original findings in Experiments 1 and 2 in Table 2 and Table 3. The authors reported *F* values from ANOVA analyses and Pearson’s *r* from correlation analyses. We calculated the partial eta-squared, Cohen’s *f* from the ANOVA analyses and constructed confidence intervals for the correlation coefficients. We also reported the standardized regression coefficients from the multiple regression analyses in the original article.

Table 2

*Target article’s Experiment 1: Summary of core findings and effect sizes*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Hypothesis** | **Reported statistics** | | | | **Calculated effect sizes [90% CIs]** | | **Findings** |
| **ANOVA analyses** | | | | | |
| *F* | | *df* | *p* | *η*2*p* | *f* |
| 1 | Respon-  sibility | 240.94 | 1, 58 | <.0001 | .81  [.71, .87] | 2.04  [1.58, 2.56] | Higher perceived onset controllability for mental-behavioral stigmas |
| Blame | 348.26 | 1, 58 | <.001 | .86  [.79, .90] | 2.45  [1.91, 3.06] |
| 2a |  | 358.53 | 1, 58 | <.0001 | .86  [.79, .91] | 2.49  [1.94, 3.10] | Less liking towards mental-behavioral stigmas |
| 2b |  | 120.54 | 1, 58 | <.0001 | .68  [.54, .77] | 1.44 [1.08, 1.84] | Less pity towards mental-behavioral stigmas |
| 2c |  | 404.72 | 1, 58 | <.0001 | .87  [.81, .92] | 2.64 [2.07, 3.29] | More anger towards mental-behavioral stigmas |
| 2d |  | 129.97 | 1, 58 | <.0001 | .69  [.56, .78] | 1.50  [1.13, 1.91] | Less assistance towards mental-behavioral stigmas |
| 2e |  | 90.62 | 1, 58 | <.0001 | .61 [.46, .72] | 1.25  [0.92, 1.62] | Less donations for mental-behavioral stigmas |
| 5 |  | 106.01 | 1, 58 | <.0001 | .65  [.50, .75] | 1.35 [1.01, 1.74] | Higher perceived stability for physically based stigmas |
|  | **Correlation analyses** | | | ***p*** | **Calculated effect sizes [95% CIs]** | | **Findings** |
| 3 | (i) and (ii): *r* = .59 (i) and (iii): *r* = .50  (i) and (iv): *r* = .38 (ii) and (iii): *r =* .66  (ii) and (iv): *r =* .38  (iii) and (iv): *r =* .65 | | | <.01 | (i) and (ii): *r* = .59 [.39, .74]  (i) and (iii): *r* = .50 [.28, .67] (i) and (iv): *r* = .38 [.14, .58] (ii) and (iii): *r =* .66 [.49, .78]  (ii) and (iv): *r =* .38  [.14, .58]  (iii) and (iv): *r =* .65 [.47, .78] | | Positive correlation between physical stigmas, perceived uncontrollability, positive affective reactions, and help-giving tendencies |
| 4 | **Multiple regression analyses** | | | *p* |  | | Correlation between positive affective reactions and help-giving tendencies was the strongest |
| (i) and (iv): 𝛽 = .12  (ii) and (iv): 𝛽 = .14 (iii) and (iv): 𝛽 = .68 | | | <.01 |

*Note.* (i) Physical stigmas; (ii) perceived onset uncontrollability; (iii) positive affective reactions; (iv) help-giving tendencies.

Table 3

*Target article’s Experiment 2: Summary of core findings and effect sizes*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Hypothesis** | **Reported statistics** | | | **Effect sizes [90% CIs] and findings** | | |
| **ANOVA analyses** | | |
| *F* | *df* | *p* | *η*2*p* | *f* | **Findings** |
| 1 | >105 | 1, 110 | <.0001 | .49  [.37, .59] | 0.98  [0.76, 1.2] | Higher perceived onset controllability for mental-behavioral stigmas |
| 2a | Less liking towards mental-behavioral stigmas |
| 2b | Less pity towards mental-behavioral stigmas |
| 2c | More anger towards mental-behavioral stigmas |
| 2d | Less assistance towards mental-behavioral stigmas |
| 2e | Less donations for mental-behavioral stigmas |
| 5 | >50 | 1, 110 | <.0001 | .31  [.19, .43] | 0.67  [0.49, 0.87] | Higher perceived stability for physically based stigmas |
| 6 | >15 | 1, 206 | <.0001 | .07  [.02, .13] | 0.27  [0.15, 0.39] | Perceived controllability results in different affective reactions and helping |
| **Hypothesis** | **Correlations** | | ***p*** | **Calculated 95% Confidence Intervals** | | **Findings** |
| 3 | (i) and (ii): *r =* .47 (i) and (iii): *r =* .44  (i) and (iv): *r =* .24  (ii) and (iii): *r =* .44  (ii) and (iv): *r =*.39  (iii) and (iv): .61 | | <.01 | (i) and (ii): *r =* .47 [.31, .60]  (i) and (iii): *r =* .44 [.28, .58]  (i) and (iv): *r =* .24 (.06, .41]  (ii) and (iii): *r =*.44  [.28, .58]  (ii) and (iv): *r =*.39  [.22, .54]  (iii) and (iv): *r =*.61  [.48, .71] | | Positive correlation between physical stigmas, perceived uncontrollability, positive affective reactions, and help-giving tendencies |
| 4 | **Multiple regression** | | ***p*** |  | | Correlation between positive affective reactions and help-giving tendencies was the strongest |
| (i) and (iv): 𝛽 = .10 (ii) and (iv): 𝛽 = .19 (iii) and (iv): 𝛽 = .57 | | <.01 |

*Note.* (i) Physical stigmas; perceived onset uncontrollability; (ii) positive affective reactions; (iii) help-giving tendencies.

## Extensions

### Participants’ categorizations of stigmas

To test for the robustness of the original findings, we aimed to extend the replication study by adding a dependent variable measuring the participants’ categorizations of the stigmas’ origin. In the original study, the hypotheses revolved around classifying stigmas by source, yet such categorizations were solely based on the researchers’ classifications. Participants might categorize the stigmas differently. For example, some may perceive obesity to be caused by a lack of will. Others may be aware that obesity is a complicated medical condition caused by the interplay of genetic, environmental, and metabolic factors (Upadhyay et al., 2018). Thus, we thought it imperative to also assess participants’ physical versus mental-behavioral origin classifications to ensure these match with the researchers’ assumptions.

### Four new current stigmas

To test for the robustness of the phenomenon and its applicability to the current context, we aimed to extend the replication by examining other current stigmas not included in the target article. In Weiner et al. (1988), stigmas were selected based on their media coverage and general prevalence in the population at that time.

Since the original article’s publication, the coverage and prevalence of different physiological and psychological conditions have changed considerably. To illustrate, there was an increase in newspaper coverage of Alzheimer’s disease between 1988 and 1997 (Adelman & Verbrugge, 2000) and a decrease in the death rates from heart disease between 2000 to 2012 (Mozaffarian et al., 2015). In terms of psychological disorders, the volume of news coverage of mental illness appears to trend downward from 1995 to 2014 (McGinty et al., 2016). At the same time, there have been increasingly more public figures disclosing their stories of mental disorders. People have also been more open to admitting their psychotherapy experiences (Hinshaw, 2009, p. ix).

Therefore, we added four prevalent and well-recognized stigmas among the US American population in the last decade to the original list. We selected diabetes and stroke, both of which we perceived somatic in origin, and major depressive disorder and anxiety disorder for stigmas we perceived to be mostly mental-behavioral in origin. As indicated by national reports and surveys, diabetes, stroke, major depressive disorder, and anxiety disorder were conditions of high prevalence in the US American population in the last decade that were not part of the original ten stigmas (Heron, 2015; Heron, 2021; Muskin, 2021; Substance Abuse and Mental Health Services Administration, 2021, p. 31 - 32, Torres, 2020).

## Exploratory directions

### Comparison between ratings in the control and experimental condition

Weiner et al. (1988)’s Experiment 2 reporting analyzed the two experimental conditions separately from their analyses of the control condition which repeated Experiment 1. We sought to explore an improvement of the analyses and reporting by supplementing the original study’s analyses by contrasting the three conditions against one another in one model. This would allow for additional insights to further understand participants’ assumptions regarding controllability when no controllability information is provided.

### Comparing the effects of controllability information between physically-based and mental-behavioral stigmas

We planned to explore if perceptions towards a particular category of stigma were more alterable under the influence of the controllability information. (1988) found that information portraying stigmas as controllable had a greater effect on judgments of physically-based stigmas. On the other hand, information portraying stigmas as uncontrollable had a greater effect on judgments of mental-behavioral stigmas. Thus, information inconsistent with the typical belief system most influenced observers’ perceptions of stigmas in Weiner et al. (1988). However, the original study did not compare the effects of controllability information on physically-based stigmas versus the effects of uncontrollability information on mental-behavioral stigmas. We aimed to first explore if judgments towards physically-based stigmas were more alterable by controllability information and whether judgments towards mental-behavioral stigmas were more alterable when uncontrollability information was presented. We then investigated if perceptions of a particular category of stigma were more alterable than the other.

**Comparing individual stigmas**

We planned to compare which conditions were most-least stigmatized by assessing which stigma was perceived as the most onset-controllable, elicited the most negative affective reactions and was the least help-giving intent (and vice versa). We also planned to assess which stigmas were most-least influenced by controllability information. (1988) did not specifically assess which stigmas were most-least influenced by components within the attribution-affect-help judgment model. However, the authors did note that “attributions for Alzheimer’s disease, Vietnam War syndrome and child abuse were subject to relatively minor change.” (p. 747) Thus, we aimed to first compare individual stigmas in the control condition, followed by comparing if perceptions on a particular stigma were more alterable than the other.

### Perceived stability and controllability

We planned to explore the role of perceived stability in perceived controllability and affective reactions, along with helping behavior. Weiner et al. (1988) found that AIDS, categorized as a mental-behavioral stigma, elicited high ratings of pity, tendencies towards charitable donations, and perceived stability. These findings did not support the original hypotheses. It is possible that perceptions of AIDS as a terminal (and hence stable) illness might have led to higher ratings of pity and help-giving, compared to other onset-controllable stigmas that were perceived to be unstable. Weiner (1986) demonstrated that stable affiliations elicit greater pity than unstable conditions. Thus, we aimed to explore associations between perceived stability, perceived controllability, affective reactions (specifically sympathy), and helping behavior.

### Rethinking the “child abuse” stigma item

During our analysis of the original stigmas, we noticed one outlier. The described stigma regarding “child abuse” differed from other stigmas in that individuals suffering from the other stigmas were commonly described as the victims. However, “child abuse” was about the person who also perpetrated the abuse rather than only its victim. Such is indicated by the controllability information description in Weiner et al. (1988): “5. Child abuse - Had been an abused child, experiencing severe stress and near a nervous breakdown; intentionally abused own child” (p.742). Weiner et al. (1988) also mentioned that “child abuse cannot be transformed from a sin into a sickness” (p. 747). Thus, child abuse seems to be a puzzling choice given the factors of focus (such as sympathy and help). In aggregated scores, this item has the potential of skewing the findings. Therefore, if we failed to find support for the predictions, we aimed to supplement the main analysis with an additional analysis excluding the child abuse stigma item.

### Changes in stigma perceptions

Given possible changes since the 1980s regarding stigmas included in the original article, we revisited perceptions regarding the stigmas. We summarized our predictions on possible changes in perceptions regarding the original ten stigmas in Table 4, yet we consider this direction exploratory.

*Replication: Summary of predictions regarding target article’s stigmas in the current replication*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Condition | Stigmas in Weiner et al. (1988) | | Relevant hypotheses and Descriptions | | |
| 1. The findings on the stigma(s) in the current replication will be similar to the original’s and support the original hypotheses. | -Alzheimer’s disease  -Blindness  -Cancer  -Paraplegia  -Child abuse  -Drug abuse  -Obesity | | All original hypotheses: **H1 - H6** (see Table 3)**.** | | |
| 2. The findings on the stigma(s) in the current replication will be similar to the original findings. However, original hypotheses on the stigma(s) will be disconfirmed again in the current replication. | -AIDS  -PTSD | | **H1** (see Table 3)**:** Stigmas having a mental-behavioral origin are perceived as more onset-controllable than stigmas having a somatic genesis.  PTSD, which was categorized as a mental-behavioral stigma, received high ratings on perceived uncontrollability in the original study, contradicting the hypothesis.  **H2a, 2c, 2d** (see Table 3)**:** Compared to physically based stigmas, mental-behavioral stigmas elicit less pity, assistance, charitable donations, and more anger from others.  In the original study, AIDS and PTSD received high ratings of pity and tendencies toward help-giving behavior. Such original findings contradicted the original hypotheses. AIDS and PTSD will receive similar ratings in terms of sympathy and tendencies towards help-giving behavior in the current replication. | | |
| 3. The categorization of the stigma(s) in the current replication will be different from that in the original. | -Heart disease | | **H1** (see Table 3)**:** Stigmas having a mental-behavioral origin are perceived as more onset-controllable than stigmas having a somatic genesis.  Americans may perceive heart disease to be a mental-behavioral stigma nowadays (Waters et al., 2014). Thus, heart disease, categorized as a physically-based stigma (following the original’s categorization), will be perceived as more onset-controllable in the current replication.  Such current perceptions of heart disease will contradict the original conceptualization of heart disease and the original findings, which indicated that heart disease received low ratings on perceived controllability. The conceptualization of heart disease as a mental-behavioral stigma, leading to higher ratings on perceived controllability, confirms the original hypothesis, but does not match the original’s categorization of heart disease. | | |

## Overview of replication and extension

We summarized the replication and extension hypotheses in Table 5. Weiner et al. (1988) empirical work consisted of two experiments In the current replication, we focused on Experiment 2, which manipulated stigma onset controllability in a between-subject design (no-information versus controllability information versus uncontrollability information). Participants then rated and categorized fourteen stigmas (ten replication, four extension) on the following factors: perceived stability, perceived controllability, liking, sympathy, anger, helping, and physical versus mental-behavioral.

*Summary of replication and extension hypotheses*

|  |  |
| --- | --- |
| **Extension Hypotheses** (assessing original’s baseline physical versus mental-behavioral categorization) | |
| 1a - g | (a) Alzheimer’s disease, (b) blindness, (c) cancer, (d) heart disease, (e) paraplegia,  (f) diabetes and (g) stroke are perceived as physically based stigmas. |
| 2a - g | (a) Post-traumatic stress disorder (PTSD), (b) acquired immune deficiency syndrome (AIDS), (c) child abuse, (d) drug addiction, (e) obesity, (f) major depressive disorder (MDD) and (g) anxiety disorder are perceived as mental-behavioral stigmas. |
| **Replication Hypotheses** | |
| 3 | Compared to physically based stigmas, mental-behavioral stigmas are perceived to be less stable. |
| 4 | Compared to physically based stigmas, mental-behavioral stigmas are perceived to be more onset-controllable. |
| 5a | Compared to physically based stigmas, mental-behavioral stigmas elicit less sympathy. |
| 5b | Compared to physically based stigmas, mental-behavioral stigmas elicit more anger. |
| 5c | Compared to physically based stigmas, mental-behavioral stigmas elicit less liking. |
| 5d | Compared to physically based stigmas, mental-behavioral stigmas elicit less charitable donations. |
| 5e | Compared to physically based stigmas, mental-behavioral stigmas elicit less assistance. |
| 6 | Physical stigmas, perceived onset uncontrollability, positive affective reactions, and help-giving tendencies are positively correlated. |
| 7 | Among the positive correlations between physical stigmas, perceived onset uncontrollability, positive affective reactions, and help-giving tendencies, the correlation between positive affective reactions and help-giving is the strongest. |
| 8 | Higher perceived controllability of a stigma leads to increased anger and decreased liking and sympathy towards the stigmatized individual, and decreased tendencies to provide personal assistance and donations. |

**Pre-registration and open-science**

We pre-registered the experiment on the Open Science Framework (OSF), and data collection was launched later that week. Pre-registrations, power analyses, and all materials used in these experiments are available in the supplementary materials. We provided all materials, data, code, and pre-registration on the OSF: <https://osf.io/gwcbt/> . We provided additional open science details and disclosures in the supplementary materials under the “Open Science disclosures” sub-section.

All measures, manipulations, and exclusions conducted for this investigation are reported, all studies were pre-registered, and data collection was completed before any analyses.

# Method

[IMPORTANT:   
Method and results were written using a randomized dataset produced by Qualtrics to simulate what these sections will look like after data collection. These will be updated following the data collection. For the purpose of the simulation, we wrote things in past tense, but no pre-registration or data collection took place yet.]

## Power analysis

To ensure that the current replication sample has sufficient power, we calculated effect sizes and power based on the statistics reported in the target article. We conducted our power analysis using the smallest effect size to identify the largest required sample size. Based on the statistics reported in the original, we calculated effect sizes of *η*2*p* = .07, *f* = 0.27, resulting in a required sample size of 240 participants (α = .05, one-tailed, power = .95). In the supplementary materials, we provided further information regarding these calculations in the “Power analysis” subsection.

Given that the original effects might be overestimated, we used the suggested Simonsohn (2015) rule of thumb, even if meant for other designs, and multiplied 240 by 2.5, resulting in 600 participants. Accounting for possible exclusions and the integrated design, and allowing for the potential of additional analyses, we aimed for a larger total sample of 800 participants. A sensitivity analysis indicated that a sample of 798 (rounded up to 800) would allow the detection of *f* = 0.14 (groups = 3, df = 1) and *d* = 0.29 (independent samples with 266 participants in each condition; both 95% power, alpha = 5%, one-tail), effects much weaker than any of the effects reported in the target article.

[Sidenote: The sensitivity analysis will be updated after data collection is completed.]

The target sample is more than double the combined sample size of Experiments 1 and 2 in the target article. To demonstrate what the results would look like after data collection, we simulated a dataset of 800 participants using Qualtrics, which we will later update with the real data.

## Participants

We recruited participants from Amazon Mechanical Turk using the CloudResearch/Turkprime platform (Litman et al., 2016). Based on our extensive experience in running similar replications on MTurk, we employed the following CloudResearch options: Duplicate IP Block. Duplicate Geocode Block, Suspicious Geocode Block, Verify Worker Country Location, Enhanced Privacy, CloudResearch Approved Participants, Block Low Quality Participants, etc., to ensure high-quality data collection. We will also employ the [Qualtrics fraud and spam prevention measures](https://www.qualtrics.com/support/survey-platform/survey-module/survey-checker/fraud-detection/): reCAPTCHA, prevent multiple submissions, prevent ballot stuffing, bot detection, security scan monitor, relevantID, etc.

Assignment pay was based on the federal wage of 7.25USD/hour, per minute, so for example, 1 USD would be paid per participant for a survey that takes 5 to 8 minutes to complete. We first pretested survey duration with 30 participants to ensure our time run estimate was accurate and then adjusted pay as needed. The data of the 30 participants will not be analyzed separately from the rest of the sample other than to assess survey completion duration and needed pay adjustments. If the survey duration was longer than expected, pretest participants would be paid a bonus as a pay adjustment.

We simulated a total of 800 participants (*Mage* = 50.9, *SD* = 28.8; 212 males, 188 females, 199 other, 201 did not disclose). In the simulation, the no-information condition comprised 267 participants. The stigma controllability condition and the stigma uncontrollability condition comprised 266 and 267 participants, respectively. We provided a comparison of the target article samples of three studies and the replication sample in Table 6.

Table 6

*Differences and similarities between original study and replication*

|  |  |  |
| --- | --- | --- |
|  | Experiment 2 in Weiner et al. (1988) | Replication and extension |
| Sample size | No-information condition: 112   Controllability & uncontrollability conditions: 208 | No information condition: 267   Controllability information condition: 266  Uncontrollability information condition: 267 | |
| Geographic origin | United States and Canada | United States | |
| Gender | 149 male and female students at UCLA and 171 male and female students at the University of Manitoba, Canda | 212 males, 188 females, 199 other, 201 did not disclose | |
| Median age (years) | Not reported | 51 | |
| Average age (years) | Not reported | 50.9 | |
| Standard deviation age (years) | Not reported | 28.8 | |
| Age range (years) | Not reported | 0 - 100 | |
| Medium (location) | Not reported | Computer (online) | |
| Compensation | Not reported | Nominal payment | |
| Year | 1988 or before | 2022 | |

## Design and procedure

We set up the survey online using Qualtrics, and participants were first asked to complete the consent form and pass verifications checks. Our experimental design manipulated controllability information with three outcomes: 1) neutral control condition with no information on stigma onset controllability, 2) stigma controllability information, and 3) stigma uncontrollability information. Participants were randomly assigned to one of the three conditions. The order of dependent variables was consistent across all stigmas, but the display order of the stigmas was randomized. Participants rated the following 14 stigmas: Alzheimer’s disease, blindness, cancer, heart disease, paraplegia, diabetes, stroke, post-traumatic stress disorder (PTSD), acquired immune deficiency syndrome (AIDS), child abuse, drug addiction, obesity, major depressive disorder (MDD), and anxiety disorder. Table 7 provides a summary of the replication and extension experimental design.

Participants rated each of the stigmas separately on several factors, and in the two information conditions, they were also presented with information on the stigmas before making the ratings. Overall, each participant made 126 ratings (9 questions for each of the 14 stigmas). At the end of the experiment, participants answered several funneling questions, provided their demographic information, and were debriefed.

To ensure attentiveness, we first introduced participants with an attention check asking them to indicate which stigma they were currently rating. Participants then responded to eight questions per stigma: 1) perceived **stability** (changeability), 2) perceived onset controllability for a stigma: **responsibility** and **blame**, 3) three questions on affective reactions towards perceived stigma onset controllability: **sympathy**, **anger**, **liking**, 4) two questions on help-giving tendencies: **charitable donation** and **assistance**. Questions on categorizing the fourteen stigmas by source were grouped and presented after participants had responded to the above eight questions per stigma. The presenting order of the fourteen questions were randomized. Such arrangement was to ensure the robustness of the manipulation in verifying if perceived sources of stigmas influence perceptions of stigmas, as hypothesized in Weiner et al. (1988). If the manipulation was presented before the above eight questions, it might reinforce participants’ pre-existing beliefs that influence their perceptions of stigmas, and such being salient would nullify the experimental manipulation. Except for perceived stigma origin, all dependent variables were on a 9-point scale anchored at the extremes (e.g., 0 - *Not responsible at all*; 8 - *Entirely responsible*).

[*For review: The Qualtrics survey .QSF file and an exported DOCX file are provided on the OSF folder. A preview link of the Qualtrics survey is provided on:* [*https://hku.au1.qualtrics.com/jfe/preview/SV\_ewH3OnmSMCVRhMq?Q\_CHL=preview&Q\_SurveyVersionID=current*](https://hku.au1.qualtrics.com/jfe/preview/SV_ewH3OnmSMCVRhMq?Q_CHL=preview&Q_SurveyVersionID=current)]

Table 7

*Replication and extension experimental design*

|  |  |  |  |
| --- | --- | --- | --- |
| **IV: Controllability information**  **(3 between)** | **No controllability information condition (Control)** | **Controllability information condition** | **Uncontrollability information condition** |
| **IV1: Stigma origin - Physical versus mental-behavioral (2 between-subject)** | Dependent variables are presented for the following stigmas, categorization by the original.  Physical origin stigmas:  Original list: Alzheimer’s disease, blindness, cancer, heart disease, paraplegia  Added as extensions: Diabetes, stroke  Mental-behavioral stigmas: Original list: Post-traumatic stress disorder (PTSD), Acquired immune deficiency syndrome (AIDS), child abuse, drug abuse, obesity Added as extensions: Major depressive disorder (MDD), anxiety disorder | | |
| Dependent variables | Replication DV: (Hypothesis 3)  Ratings perceived stigma stability (changeability)  (0 = *Not changeable at all*; 8 = *Very changeable*) | | |
|  | Replication DV: (Hypothesis 4)  Ratings perceived responsibility  (0 = *Not at all responsible*; 8 = *Entirely responsible*)  Ratings perceived blame  (0 = *Not to blame at all*; 8 = *Entirely to blame*) | | |
|  | Replication DV: (Hypothesis 5a)  Sympathy felt towards individuals with a particular stigma  (0 = *Do not feel sympathetic at all*; 8 = *Feel very sympathetic*) | | |
|  | Replication DV: (Hypothesis 5b)  Anger felt towards individuals with a particular stigma (0 = *No anger*; 8 = *A great deal of anger*) | | |
|  | Replication DV: (Hypothesis 5c) Liking felt towards individuals with a particular stigma  (0 = *Do not like at all*; 8 = *Like very much*) | | |
|  | Replication DV: (Hypothesis 5d)  Willingness to provide charitable donations for individuals with a particular stigma  (0 = *No donations at all*; 8 = *A great deal of donations*) | | |
|  | Replication DV: (Hypothesis 5e)  Willingness to provide assistance for US Americans with a particular stigma. (0 = *Totally unwilling to assist*; 8 = *Willing to assist*) | | |
|  | Extension DV: (Hypothesis 1a - g; Hypothesis 2a - g)  Participant’s categorization of stigma origin:  (*Physical* or *mental-behavioral*) | | |

## Deviations from the original

We made several adjustments to the original’s method and design to adapt the study to an online Qualtrics data collection. We further simplified the questionnaire format and improved the study design.

In the original study’s Experiment 2, the authors manipulated controllability information and created three outcomes: i) neutral control condition with no information on stigma onset controllability, ii) stigma controllability information and iii) stigma uncontrollability information. Thus, researchers could conduct a between-subject comparison and contrast the three conditions against one another in testing the effects of controllability information on the participants’ perceptions of stigmas.   
 However, the original study balanced the controllability/uncontrollability conditions by evenly mixing controllability and uncontrollability stigma information in the two information conditions. This meant that in practice, participants were randomly assigned to one of the following three conditions: 1) neutral control condition, 2) seven stigmas described as controllable and the other seven described as uncontrollable, and 3) the stigmas described in #2 as controllable described as uncontrollable and vice versa. Such created a within-subjects design in which participants in the experimental condition were exposed to two outcomes from manipulation, i.e., stigma controllability information and stigma uncontrollability information. Stigma ratings in the control condition were therefore analyzed separately from the two experimental conditions with controllability information. In sum, there was no true comparison between the control condition and experimental conditions, as the display of the stigmas in each condition did not reflect the between-subjects design created from manipulating controllability information.   
 Building on constructive peer-reviewer’s feedback, we improved the experimental design per reviewer feedback to test for the causal effects of controllability information on perceptions of stigmas. In our study, the IV controllability information was truly between-subjects (i.e., participants either received no information, they received information that depicted all conditions as onset controllable, or information that depicted all conditions as onset uncontrollable).

The authors of the target article generated twelve varying questionnaire formats based on three order factors: 1) stigma display order, 2) dependent variable display order, and 3) balancing the controllability and uncontrollability information manipulation for stigmas. They concluded no support for display order to have any impact on the results. This meant that there was no true randomization of stigma display order, and using the original’s experimental design in controllability information display resulted in specific stigmas to be contrasted against specific others regarding controllability information (see summary in Table 1). We conducted a full randomization of the stigmas’ display order and fixed the order of the dependent variables to be consistent across all stigmas for all participants.

We made changes to the questionnaire to address study design issues and verify the original study's robustness. We summarized these modifications in Table 1. To illustrate, one of the design issues was that the target’s description of the scales did not match the reported findings. Specifically, the original study indicated a 9-point scale, which did not match the reported statistics, and we decided to follow the description. In addition, in our instructions, we added a specific clarification instructing participants that ratings should be made in consideration of other US Americans with a particular condition, as perceived stigma onset controllability could vary across different countries and cultures. We also specified that controllability ratings pertained to onset-controllability, as the original study did not specify to participants whether the judgments pertained to onset-controllability or offset-controllability.

Lastly, we made changes to the wording. “Sympathy” was used in our survey to replace “pity” as the former was more relevant to the current context. We also changed the wording of different stigma labels. As “Vietnam War syndrome” seemed to be outdated, we changed the stigma label to “Post-traumatic stress disorder (PTSD),” which we thought was more generalizable and fitting for current times. In addition, we used the terms “individuals/people with obesity” and “individuals/people with AIDS” to not perpetuate stigma in research.

## Evaluation criteria for replication findings

We aimed to compare the replication effects with the original effects in the target article using the criteria set by LeBel et al. (2019) (see section “Replication evaluation” in the supplementary).

## Replication closeness evaluation

We provided details on the classification of the replications using the criteria by LeBel et al. (2018) criteria in Table 8 below (also see section “Replication evaluation” in the supplementary). We summarized the replication as a close replication.

Table 8

*Classification of the replication, based on LeBel et al. (2018)*

|  |  |  |
| --- | --- | --- |
| **Design facet** | **Replication** | **Details of deviation** |
| Effect/hypothesis | Same |  |
| IV construct | Same |  |
| DV construct | Same |  |
| IV operationalization | Same |  |
| DV operationalization | Similar | The original study used a 10-point scale (0 to 9) for some of the variables. In our replication, we used a 9-point scale that ranged from 0 to 8 across all items to keep them consistent. |
| Population (e.g., age) | Similar | The original study recruited college students from UCLA in the United States and the University of Manitoba in Canada in return for class credit in introductory psychology. We sampled US American respondents. |
| IV stimuli | Similar | We included the ten stigmas from the original list and added four that were prevalent in the current context as an extension. We also updated the stigma labels for relevance to the current context. |
| DV stimuli | Similar | Kept the same dependent variables stimuli, yet fixed order of display. As an extension, we also asked participants to categorize stigma as either physical or mental-behavioral in origin. Lastly, we add to the instructions to reference US Americans with a particular stigma to address possible cultural concerns. |
| Procedural details | Different | We adopted a between-subjects design in which participants either received 1) no controllability information, 2) information that depicted all conditions as onset controllable, or 3) information that depicted all conditions as onset uncontrollable. The original study used a within-subjects design by evenly mixing controllability and uncontrollability stigma information in the two experimental conditions. |
| Physical settings | Different | Our replication collected data online, and participants completed the survey individually. Participants in the original study completed pen-and-paper questionnaires in group settings. |
| Contextual variables | Different | The original study was conducted in the 1980s, whereas we conducted our replication study in 2022. |
| Replication classification | A close replication |  |

## Data analysis strategy

### Replication: As in the original

Following Weiner et al. (1988), we first focused on the no information (control) condition (*N* = 267) and conducted one-way repeated measures ANOVAs to compare the ten physically-based versus mental-behavioral stigmas used in the target article on perceived stability and controllability, affective reactions, and help-giving judgment. We then conducted correlation and multiple regression analyses to test the relationships between stigma source and those dependent variables in the control condition across all stigmas.

### Replication: Improvement from the original

We used two-way between-subjects ANOVAs to compare the controllability condition (*N =* 266) versus uncontrollability information (*N =* 267) for physically-based stigmas versus mental-behavioral stigmas, on perceived controllability, affective reactions, and help-giving judgment.

### Extensions: Four newly added stigmas

We repeated the above analyses for the four newly added extension stigmas - diabetes, stroke, major depressive disorder, and anxiety disorder.

### Exploratory analyses

The target article conducted separate analyses for the control neutral condition and the contrast between the two information conditions. As supplementary exploratory analyses, we ran the three conditions together in the same ANOVA model. Such allowed us to compare the participants’ perceptions of controllability across the control and experimental conditions. We could also further compare the effects of the manipulation between physically-based and mental-behavioral stigmas across conditions.

We further aimed to evaluate which conditions were the most-least stigmatized, as informed by the extremities in the ratings and the stability of ratings across conditions. In addition, we aimed to explore correlations between perceived stability, perceived controllability, affective reactions, and helping behavior.

Given that “child abuse” is an outlier item, we planned to rerun the same analyses without this item if we failed to find support for the predicted hypotheses.

### Exclusions

Our reporting will focus on the full sample of participants who completed the study. We predetermined exclusions that we will examine in one additional joint analysis in case we fail to find support for our predictions. Our exclusion criteria is as follows: 1) low proficiency of English (self-report < 5, on a 1-7 scale), 2) self-reporting not being serious about filling in the survey (self-report < 4, on a 1-5 scale), 3) self-reporting to have seen or done the survey before. In such a case, we will report and compare both the pre and post exclusion findings and summarize the differences.

# Results

[IMPORTANT:   
Method and results were written using a randomized dataset produced by Qualtrics to simulate what these sections will look like after data collection. These will be updated following the data collection. For the purpose of the simulation, we wrote things in past tense, but no pre-registration or data collection took place yet.]

[Note about tables: Code and outputs based on simulated random noise data are provided on the OSF. We added the tables below as placeholders to give readers an idea of what the results section would look like following data collection. We only filled several examples, but mostly left the tables empty, given that the random noise numbers are meaningless.]

## Extension: Measuring participants’ categorizations of stigma by source

We examined whether the categorization used by the target article matches that of our sample. We summarized descriptive statistics for the categorizations of stigmas in Table 9.

Table 9

*Summary of participants’ responses matching researchers’ categorization of stigmas in the control (no info) condition*

|  |  |
| --- | --- |
| **Physically-based stigmas** | Counts of participants’ responses matching researchers’ categorization *(N = 267)* |
| Alzheimer’s disease |  |
| Blindness |  |
| Cancer |  |
| Heart disease |  |
| Paraplegia |  |
| Diabetes |  |
| Stroke |  |
| **Mental-behavioral stigmas** | |
| Post-traumatic stress disorder (PTSD) |  |
| Acquired immune deficiency syndrome (AIDS) |  |
| Child abuse |  |
| Drug abuse |  |
| Obesity |  |
| Major Depressive Disorder (MDD) |  |
| Anxiety Disorder |  |

We summarized descriptive statistics of all measures across the three conditions in Table 10.

Table 10

*Mean ratings and standard deviations of the ratings on stigmas in all conditions*

| **Stigma** | **Condition** | **Changeability** | **Responsibility** | **Blame** | **Sympathy** | **Anger** | **Like** | **Donate** | **Assist** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Alzheimer’s disease | ni | 4.04 (2.57) | 4.03 (4.99) | 4.21 (2.58) | 3.93(2.75) | 4.05 (2.54) | 4.03(2.64) | 3.93(2.64) | 4.10 (2.50) |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Blindness | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Cancer | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Heart disease | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Paraplegia | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Diabetes | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Stroke | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Post- traumatic stress disorder (PTSD) | ni*)* |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Acquired immune deficiency syndrome (AIDS) | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Child abuse | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Drug abuse | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Obesity | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Major depressive disorder (MDD) | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |
| Anxiety disorder | ni |  |  |  |  |  |  |  |  |
| ci |  |  |  |  |  |  |  |  |
| uci |  |  |  |  |  |  |  |  |

*Note.* ni = no information condition (*N = 267)*; ci = controllable information condition (*N = 266)*; uci = uncontrollable information condition (*N = 267)*. Reported values are in the format *Mean* (*SD*).

## 

Results from one-way repeated measures ANOVAs testing H3, H4, and H5a-e are summarized in Table 11. Results from correlation and multiple regression analyses testing for H6 and H7 are summarized in Table 12. Results from two-way between-subjects ANOVAs testing for H8 are summarized in Table 13. All analyses outlined above included participants’ ratings on the four newly added stigmas: diabetes, stroke, major depressive disorder (MDD),

*Summary of ANOVA test results in the control (no info) condition*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Control (i.e., no info) condition: One-way repeated measures ANOVA** | | | | | | | | |
| Within subjects effects: Contrast between perceptions on physically based and mental-behavioral stigmas  *(N = 267)* | | | | | | | | |
| Hypothesis | | Sum of Squares | | df | Mean Square | *F* | *p* | Interpretation |
| 3 | Mental-behavioral stigmas are perceived to be less stable | 1 | | 1 | 1.06 | 0.16 | 0.69 |  |
| 4 | Mental-behavioral origin stigmas are perceived as more onset-controllable | Responsibility |  |  |  |  |  |  |
| Blame |  |  |  |  |  |  |
| 5a | Mental-behavioral stigmas elicit less sympathy |  | |  |  |  |  |  |
| 5b | Mental-behavioral stigmas elicit more anger from observers |  | |  |  |  |  |  |
| 5c | Mental-behavioral stigmas elicit less liking |  | |  |  |  |  |  |
| 5d | Mental-behavioral stigmas elicit less charitable donations |  | |  |  |  |  |  |
| 5e | Mental-behavioral stigmas elicit less assistance |  | |  |  |  |  |  |

Table 12

*Summary of correlation and regression analyses in the control (no info) condition*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Control (i.e., no info) condition: Correlation and regression analyses** | | | | | | | |
| **Correlation** | | | | | | | |
| Hypothesis | | *r* and CI, 95% CI [LL, UL] | | | | | |
| Variable | 1 | 2 | 3 | 4 | Interpretation |
| 6 | Physical stigmas, perceived onset uncontrollability, positive affective reactions, and help-giving tendencies are positively correlated. | 1. Physical stigmas | - |  |  |  |  |
| 2.Uncontrollability | -.03 | - |  |  |  |
| 3. Positive affect | .06 | -.02 | - |  |
| 4. Help-giving tendencies | 0 | 0 | -.02 | - |
| **Regression** | | | | | | | |
| Hypothesis | | Predictor | 𝛽 | 𝛽  95% CI  [LL, UL] | Fit |  | Interpretation |
| 7 | Help-giving tendencies is most associated with positive affect | (Intercept) | 8.05 | 7.86, 8.24 |  |  |  |
| Physical stigmas | -0.02 | -0.25, 0.22 |  |  |
| Perceived uncontrollability | 0 | -0.03, 0.03 |  |  |
| Positive affect | -0.01 | -0.04, 0.01 |  |  |
|  | | | *R*2 *=* 0  *F*(3, 3734) = 0.33 |  |

*Note: 𝛽* indicates the standardized regression weights.

Table 13

*Summary of ANOVA test results in the experimental conditions*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Experimental condition (controllability info vs. uncontrollability info): Two-way ANOVA** | | | | | | | | | | |
| Between subjects effects: Contrast between perceptions on physically based and mental-behavioral stigmas  *(N = 533)* | | | | | | | | | | |
| Hypothesis 8 | | | |  | Sum of Squares | Df | Mean Square | *F* | *p* | Interpretation |
|  | Mental-behavioral stigmas are perceived to be less stable | | | Stigma source | 19 | 1 | 19.45 | 2.90 |  |  |
|  |  | | | Controllability information | 0 | 1 | 0.35 | 0.05 |  |  |
|  |  | | | Stigma source\*  Controllability information | 8 | 1 | 8.49 | 1.26 |  |  |
|  | Mental-behavioral origin stigmas are perceived as more onset-controllable | Responsibility | | Stigma source |  |  |  |  |  |  |
|  | |  |  | Controllability information |  |  |  |  |  |  |
|  | |  |  | Stigma source\*  Controllability information |  |  |  |  |  |  |
|  |  | Blame | | Stigma source |  |  |  |  |  |  |
|  | |  |  | Controllability information |  |  |  |  |  |  |
|  | |  |  | Stigma source\*  Controllability information |  |  |  |  |  |  |
|  | Mental-behavioral stigmas elicit less sympathy | | | Stigma source |  |  |  |  |  |  |
|  |  | | | Controllability information |  |  |  |  |  |  |
|  |  | | | Stigma source\*  Controllability information |  |  |  |  |  |  |
|  | Mental-behavioral stigmas elicit more anger from observers | | | Stigma source |  |  |  |  |  |  |
|  |  | | | Controllability information |  |  |  |  |  |  |
|  |  | | | Stigma source\*  Controllability information |  |  |  |  |  |  |
|  | Mental-behavioral stigmas elicit less liking | | | Stigma source |  |  |  |  |  |  |
|  |  | | | Controllability information |  |  |  |  |  |  |
|  |  | | | Stigma source\*  Controllability information |  |  |  |  |  |  |
|  | Mental-behavioral stigmas elicit less charitable donations | | | Stigma source |  |  |  |  |  |  |
|  |  | | | Controllability information |  |  |  |  |  |  |
|  |  | | | Stigma source\*  Controllability information |  |  |  |  |  |  |
|  | Mental-behavioral stigmas elicit less assistance | | | Stigma source |  |  |  |  |  |  |
|  |  | | | Controllability information |  |  |  |  |  |  |
|  |  | | | Stigma source\*  Controllability information |  |  |  |  |  |  |

## Exploratory analyses

All results of exploratory analyses will be added after data collection. Table 14 provides a summary of the correlations between all dependent variables in all conditions, based on the aggregated ratings on all stigmas.

## Comparing replication to original findings [This section will be completed in Stage 2 following data collection.]

We compared the results of the replication to the original findings based on LeBel et al. (2019) outcome interpretation criteria - 1) signal / no signal, 2) consistency / inconsistency, 3) larger / smaller / opposite effect, by comparing replication effect confidence intervals to the original effect size.

Table 14

*Summary of correlations between all variables in all conditions*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Condition | Changeability | Responsibility | Blame | Sym-pathy | Anger | Like | Donate | Assist |
| Changeability | ni | - |  |  |  |  |  |  |  |
| ci | - |  |  |  |  |  |  |  |
| uci | - |  |  |  |  |  |  |  |
| Responsibility | ni | .23 | - |  |  |  |  |  |  |
| ci | -.10 | - |  |  |  |  |  |  |
| uci | .00 | - |  |  |  |  |  |  |
| Blame | ni |  |  | - |  |  |  |  |  |
| ci |  |  | - |  |  |  |  |  |
| uci |  |  | - |  |  |  |  |  |
| Sympathy | ni |  |  |  | - |  |  |  |  |
| ci |  |  |  | - |  |  |  |  |
| uci |  |  |  | - |  |  |  |  |
| Anger | ni |  |  |  |  | - |  |  |  |
| ci |  |  |  |  | - |  |  |  |
| uci |  |  |  |  | - |  |  |  |
| Like | ni |  |  |  |  |  | - |  |  |
| ci |  |  |  |  |  | - |  |  |
| uci |  |  |  |  |  | - |  |  |
| Donate | ni |  |  |  |  |  |  | - |  |
| ci |  |  |  |  |  |  | - |  |
| uci |  |  |  |  |  |  | - |  |
| Assist | ni |  |  |  |  |  |  |  | - |
| ci |  |  |  |  |  |  |  | - |
| uci |  |  |  |  |  |  |  | - |

*Note.* ni = no information condition (*N = 267)*; ci = controllable information condition (*N = 267)*; uci = uncontrollable information condition (*N = 267)*.

# Discussion

[Discussion will be completed in Stage 2 following data collection]

**Limitations** Weiner et al. (1988) defined stigma as “a mark or sign for perceived conditions of deviations from the norm” (Jones et al., 1984). A bearer of stigma is viewed as “generally limited or undesirable” (Goffman, 1963), and the target article summarized stigmas to “represent negative outcomes or unwanted effects.” We followed the original’s conceptualization, which primarily portrayed stigmas as conditions undesirable or limiting in society. However, there may be other ways to conceptualize stigmas, including connotating stigma with discrimination and marginalization. The current study may be better understood as “an attributional analysis of reactions to socially undesirable conditions.”

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