THE INFLUENCE OF VISUAL CUES ON CONSUMER DONATIONS

by

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DISSERTATION ABSTRACT

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This dissertation explores how visual cues, such as a victim's image or the color used in a donation appeal, can influence consumers' donation intention. The first main chapter, "Less is More: The Benefit of Using Blurry Versus High-Resolution Victim Images in Donation Appeals," discusses the unusual and unexpected backfire effect of using high-resolution victim images in appeals. More specifically, using a higher quality image can bring about less desirable outcomes compared with those of a moderately blurred image. A further analysis of this effect revealed that donors' perception of dissimilarities between themselves and victims moderates the image blurriness effect. In addition, donors' perceived dissimilarities between donors and victims create longer image processing time and enhance donors' cause involvement. The results further show that the stronger involvement created by a moderate image blurriness serves as a mediator and leads to more willingness to donate.

The second main chapter, "Red Versus Blue: How Color Can Make Consumers More Sensitive to Mass Suffering," examines the use of color (i.e., red vs. blue) to present numeric information about victims in donation appeals. The color can potentially influence consumers' sensitivity to victim statistics and thus affect donation intention. In particular, evidence was found that, when a congruence exists between message framing

(i.e., prevention focused vs. promotion focused) and color (i.e., red vs. blue), individuals

become more sensitive to the number of victims when making donation decisions.

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CHAPTER I

INTRODUCTION

This dissertation focuses on how visual cues such as victims' images or color schemes used in donation appeals influence consumers' donation intention. Past research has explored the effectiveness of using these images in appeals or the ways that the background color of appeals affects consumers' donation decisions. The current study, however, concentrated on how previously unexplored visual cues—image resolution and color of numeric information—influence consumers' donation intention.

The next chapter, "Less is More: The Benefit of Using Blurry Versus High-Resolution Victim Images in Donation Appeals," presents the counterintuitive results of high-resolution victim images in donation appeals. More specifically, when charitable causes are relatively serious (e.g., supporting children in danger of dying) and victims' images in donation appeals appear to express negative emotions, using high-resolution images of the victims can backfire. Their impact can reduce consumers' donation intention compared to when the victims' images are moderately blurred.

Two competing hypotheses were developed to elucidate this effect's mechanism. The first was that using high-resolution victim images creates an emotional burden for potential donors and thus they are reluctant to process the donation appeals in question more deliberately, which leads to lower donation intention. The second hypothesis assumed that the more concrete nature of high-resolution images highlights dissimilarities

between the donors and victims, so donors are less willing to process these donation appeals thoughtfully and make donations.

A series of experiments and a field study confirmed the predicted effect and facilitated the testing of the two competing hypotheses. Donors' perceptions of dissimilarities between themselves and the victims (i.e., differences in gender and/or ethnicity) influence the way these donors interpret high-resolution victim images. In addition, a moderate level of image blurriness contributes to donors' higher cause involvement, resulting in increased donation intention.

The next chapter, "Red Versus Blue: How Color Can Make Consumers More Sensitive to Mass Suffering," is about how red and blue can best be used to present victim statistics in donation appeals with different types of message framing. Based on the literature on color psychology and message framing in appeals to consumers for donations, the hypothesis was formulated that the congruence between color (i.e., red vs. blue) used to display victim numbers and the message framing (i.e., prevention focused vs. promotion focused) makes consumers more sensitive to the number of victims and increases donation amounts as the number rises. Three studies provided preliminary evidence supporting the hypothesis, especially when the message is framed as prevention focused and the victim statistics are presented in red. The studies' limitations and suggested future research directions are discussed.

CHAPTER II

ESSAY 1 – LESS IS MORE: THE BENEFIT OF USING BLURRY VERSUS HIGH-RESOLUTION IMAGES IN DONATION APPEALS

With technological advances, high-resolution images and videos are now ubiquitous. When we watch a television show or see an image posted on the Internet, it is now possible to discern minute levels of detail. Firms manufacturing electronic devices using display technology put in a significant amount of resources to improve their display technology, believing that the clearer the image is, the better it is. Moreover, professional photographers use high-technology cameras to capture the moments in high-resolution, and in commercial settings, high-resolution images are often used in advertising or packaging.

A high-resolution image can be defined as an image with a high spatial resolution and a high pixel-per-inch (ppi) ratio (e.g., 300 ppi). High spatial resolution images make objects more discernable and create sharpness (Schowengerdt, 2006). Thus, as the resolution increases, the image looks clearer and reflects the details of an object. In the current research, we explore the novel and unexpected effects of using high-resolution images in donation appeals. Specifically, in the consumer donation context, we show that using high-resolution images of victims in a donation appeal can bring about less desirable outcomes. Based on the vividness theory (Kisielius & Sternthal, 1984; Taylor & Thompson, 1982), we predict that using a high-resolution victim image can backfire, and a moderate level of blurriness of a victim image can help potential donors to better engage in a donation appeal.

In the current research, the level of blurriness/clarity is manipulated by the widely used Gaussian Blur Image Processing technique to decrease the spatial resolution. By increasing the standard deviation (SD) of the spatial resolution, the Gaussian blur image processing increases the image blurriness and reduces the image quality (De & Masilamani, 2013). Figure 1 shows an example.

Figure 1. Gaussian Blur Image Processing using Different Levels of Standard Deviation
(adapted from De & Masilamani, 2013, p. 150)
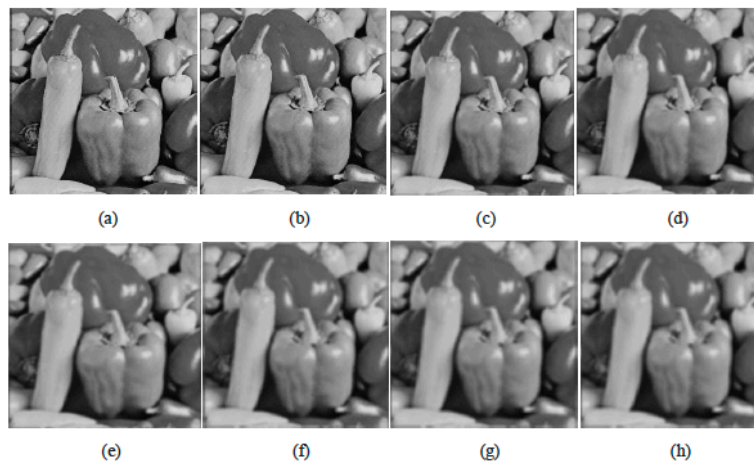
Fig. 1. Peppers image blurred with Gaussian Blur with different standard deviation (a) Original Image (b) sigma =0.4 (c) sigma = 0.8 (d) sigma = 1.2 (e) sigma =1.6 (f) sigma = 2.0 (g) sigma = 2.4 and (h) sigma = 2.8.

From our series of studies, by manipulating the levels of blurriness of victim images used in a donation appeal, we show cases where a moderate level of blurriness (versus high-resolution images) can benefit a charity's fundraising. Specifically, we have developed two competing hypotheses to elucidate this effect's mechanism. The first hypothesis is that using high-resolution victim images could impose an emotional burden to potential donors, who would thus be reluctant to process the donation appeals more deliberately, which would lead to a lower donation intention. In this account, our prediction is that a high similarity between donors and victims would increase the

suggested blurriness-is-better effect as the donors would be more likely to feel an emotional burden when they see the victims as highly similar to them.

The second hypothesis assumes that the more concrete nature of high-resolution images would highlight dissimilarities between donors and victims, so donors would be less willing to process these donation appeals thoughtfully and make donations. If this is true, the dissimilarity between donors and victims would create the blurriness-is-better effect as the moderate level of blurriness would decrease the perception of dissimilarity and lead to a higher engagement in a donation appeal. To test these hypotheses, we examine whether gender and ethnic dissimilarities between donors and victims would influence the blurriness-is-better effect.

In line with these predictions, we also demonstrate that when a victim's image is blurred in contrast to a high-resolution image, donors are more likely to engage in processing the donation appeal and perceive a higher cause involvement. Lastly, we test the boundary condition of our effect, such that our predicted blurriness-is-better effect is manifested only when the charitable cause is dire and severe. Note that our level of blurriness manipulation is minor to avoid impeding the understanding of the message/appeal.

We expect this research to contribute to the literature by showing the positive effect of image blurriness and the negative effect of image clarity as visual cues in a donation appeal. The results also provide practical implications for charities to create effective donation appeals as the blurriness of an image is easy to change using image processing techniques.

Conceptual Background

Use of Victim Images in Donation Appeals

Charities often use a photo of a victim or a donation recipient in their donation appeals, which can have various positive effects. The identifiable victim effect suggests that a single identified victim (versus statistical victims) enhances donors' emotional reactions, such as sympathy, and promotes donation (Jenni & Loewenstein, 1997; Small et al., 2007). Subsequently, the identified intervention effect has shown that a specific description of a charity's intervention increases donors' willingness to donate because it increases their perceived contributions. The authors insist that the identified intervention effect is a broader phenomenon that incorporates the identified victim effect (Cryder et al., 2013). As a result, in the real world, we can easily see donation appeals using an image of a victim or a donation recipient. In addition to the victim image, a donation appeal includes specific information about the patient and describes the charity's effort and intervention to support the patient in order to induce sympathy and increase donors' perceived contributions.

In the consumer donation context, research has revealed that the visual representation of a victim matters for donors' willingness to donate. For example, a victim's emotional expression—sadness in particular—is known to evoke compassion and increases donors' generosity (Small & Verrochi, 2009). Furthermore, research has demonstrated that the visual attractiveness of a victim shown in a donation appeal influences donors' willingness to donate. Fisher and Ma (2014) have examined how the attractiveness of a child presented in a donation appeal could potentially reduce donors'

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willingness to donate due to the "beautiful is good" stereotype. The authors explain that as long as the charitable cause is not serious, donors could perceive a beautiful child shown in a donation appeal as less needy and would thus donate less. In line with these findings, Cryder et al. (2017) have shown that the mode of processing moderates the "charity beauty premium." Specifically, they demonstrate that when donors are asked to make a donation decision intuitively, the "want" desire will make donors donate to a good-looking victim, whereas when they rely on deliberate processing, their "should" desire will make them donate to a more needy, less attractive victim.

While past studies testing the effect of a victim image on a donation appeal have investigated how the emotional expression or attractiveness of a victim presented in a donation appeal influence the donation intention (Cryder, Botti, & Simonyan, 2017; Fisher & Ma, 2014; Small & Verrochi, 2009), we test the novel effects of an image resolution on donation appeals. In particular, we predict that using a high-resolution image of a victim does not always help a charity's fundraising effort. To test this prediction, we explore the negative effect of a vivid image, as well as the positive effect of a less vivid (i.e., blurry) image.

Image Vividness and Blurriness as Visual Cues

The vividness theory (Kisielius & Sternthal, 1984; Taylor & Thompson, 1982) suggests that verbal and visual vividness can increase the persuasiveness of an advertisement and influence individuals' attitudes or judgment about a product or a brand. Especially, the vividness literature shows that compared with a verbal description, since a pictorial representation often contains vivid information about an object, the imagery derived from a concrete image lasts longer in memory because individuals are

more likely to be involved in cognitive elaboration (Edell & Staelin, 1983; Kisielius & Sternthal, 1984; Petrova & Cialdini, 2005). This effect is even stronger among individuals who have high dispositional imagery abilities (Bone & Ellen, 1992; Petrova & Cialdini, 2005). For this reason, the absence of an image versus the presentation of an image has been used as a manipulation of vividness (Edell & Staelin, 1983; Kisielius & Sternthal, 1984).

While the majority of the above-cited research has investigated how the presence (versus absence) of an image has an impact on the evaluation of an advertisement or a product, several studies have manipulated the level of image vividness and measured individuals' evaluation of the advertisement. For instance, Mitchell and Olson (1981) have shown that compared with the no image condition or the abstract image condition, the vivid image condition results in stronger positive attitudes toward an advertisement. Similarly, Babin and Burns (1997) have compared the effectiveness of a vivid image versus an abstract image in terms of eliciting imagery and have found that a vivid image induces higher imagery processing than an abstract image. These findings correspond to the *image-concreteness effect*, showing that as the concreteness of stimuli increases, the more likely will vivid imagery be induced (Paivio, 1969). Indeed, the impact of image concreteness has been explored in the advertising context dealing with fear appeals, such that a vivid image is more persuasive as a communication method as it triggers emotional reactions (Block & Keller, 1997; Sherer & Rogers, 1984).

Compared with the fact that the effects of a vivid image or imagery on an individual's attitude or persuasion have been investigated in a few studies, the research exploring the effects of image blurriness is relatively scarce. Generally, from the

processing fluency perspective, the findings show that image clarity supports perceptual

fluency and increases the recall rate (Reber et al., 2004; Whittlesea et al., 1990). In the

image processing literature, Khan et al. (2011) have shown that the blurriness of an image

decreases the salience of an object and reduces the viewer's attention. Because a blurred

image is less salient and needs further processing, the level of blurriness has been

adjusted in studies to manipulate the viewer's attention and fluency (Gao et al., 2016;

Harley et al., 2004; Labroo & Kim, 2009; Zhang et al., 2017). Thus, the stream of

literature provides information about the negative influence of image blurriness, such that

the perceptual disfluency created by image blurriness in general deters fluent processing

and decreases attention.

However, it is interesting that in social psychology, Sansom-Daly and Forgas

(2010) have found the effect of blurriness on impression formation. They manipulated the

blurriness of a photo of a person's face and asked the participants to rate their

impressions. The findings showed that when perceptual disfluency existed (i.e., the photo

of a person's face was slightly blurred), the effect of valence priming was amplified as

the blurred image generated effortful processing. In detail, when the participants were

exposed to positive priming, the disfluent image showed higher impression ratings,

whereas for the negative priming, the impression rating was significantly lower.

In the domain of goal pursuit research, Labroo and Kim (2009) have introduced

the "instrumentality heuristic," demonstrating that when individuals pursue their goals,

effortful processing caused by low fluency (i.e., a blurred image) can actually be

instrumental for attaining their goals and thus result in higher evaluation or behavioral

intention. Furthermore, Pocheptsova et al. (2010) have demonstrated that when

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consumers use a product on a special occasion, metacognitive difficulty increases the product's uniqueness and attractiveness and thus fosters higher product evaluation. In sum, from the perceptual fluency perspective, the blurriness of visual stimuli that causes disfluency can have either a negative or a positive effect on the evaluation, depending on the context and the situation. Especially, when the object is unfamiliar, research shows that higher perceptual fluency in general is more desirable. However, if individuals have to evaluate a familiar object, high fluency might backfire as they could lose interest and engagement (Labroo & Pocheptsova, 2016).

Based on the past literature, we predict that a vivid image could be daunting in certain situations and could cause a backfire effect on a donation appeal. Because vivid images induce concreteness and last longer in memory, it is possible that potential donors are less likely to evaluate a donation appeal deliberately when a high-resolution victim image is presented than when a moderately blurred victim image is used, especially when the charitable cause is serious or dire. Stated formally, we propose our first hypothesis:

H1: The use of a moderately blurred (versus a high-resolution) victim image can positively influence an individual's willingness to donate.

The main prediction of H1 is that when a victim's high-resolution image is used in a donation appeal, individuals in general could have less intention to process the donation appeal when the charitable cause is severe. Thus, we anticipate that the moderate level of blurriness of an image could make participants spend more time looking at the donation appeal as it is emotionally appealing yet less intimidating. As a result, we expect participants to perceive a charitable cause as more attainable and to show a higher willingness to get involved in it when the victim images are moderately

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blurred compared with the condition where high-resolution victim images are used. Therefore, we make this prediction:

> H2: Individuals' perceived cause involvement can be increased when the victim image is blurred (versus high-resolution) and will mediate the effect shown in H1.

Next, we provide two possible moderators for our suggested effect. First, we predict that the effect is due to individuals' emotional coping. In detail, it is possible that individuals are less likely and less willing to engage in a donation appeal if the emotion triggered by a victim's high-resolution image is too intimidating and hard to cope with. In this case, individuals will less likely process the donation appeal in a deliberate manner, thus resulting in less donation intention, and this tendency will be more prominent if the donor perceives a victim as a member of their in-group (i.e., high similarity). Another possible explanation is that as an high-resolution image depicts concreteness, potential donors are more likely to catch dissimilarities between the victim and themselves and as a result, are less likely to be engaged in the donation appeal, especially when the victim is perceived as a member of out-group (i.e., low dissimilarity) from the donors. Therefore, we propose two contradictory hypotheses, as follows:

> H3a: A high perceived similarity between a donor and a victim can negatively influence the donor's willingness to donate when a high-resolution (versus blurred) victim image is used.
>
> H3b: A low perceived similarity between a donor and a victim can negatively influence the donor's willingness to donate when a high-resolution (versus blurred) victim image is used.

Lastly, for a boundary condition of our suggested effects, we predict that the blurriness-is-better effect will only hold when the charitable cause is relatively dire and serious (i.e., heartbreaking cause, life threatening). If the charitable cause is uplifting (i.e., focusing on improving the lives of victims, not life threatening) and the image of the victim is showing a positive emotion rather than expressing a negative emotion, our predicted blurriness-is-better effect is less likely to occur. Because heartbreaking (versus uplifting) donation appeals can be perceived as more severe and intimidating, we expect the blurriness effect to be more prominent for a heartbreaking cause with the victim's negative emotional expression. Thus, we make the following prediction:

> H4: The type of charitable cause will moderate the effect shown in H1, such that when the charitable cause is heartbreaking (versus uplifting), a blurred image (versus a high-resolution image) will increase (versus decrease) the donor's willingness to donate.

In the next studies, we tested our hypotheses with experiments and a field study. Specifically, in Study 1, we tested the main effect using donation appeals with different degrees of image blurriness. In Study 2, we also investigated the main effect using the same setting as that in Study 1 but with an added control condition without an image of a victim to provide strict comparisons. In Study 3, we conducted a field study to show how the effect would be reflected in real-world donation behaviors. In Study 4, we studied and tested the hypotheses with different victim images than those used in Studies 1–3 to extend the generalizability of the effect and demonstrate mediation of cause involvement. In Study 5, to show a possible underlying mechanism, we directly tracked individuals' eye fixations using an eye-tracking device and showed the initial evidence of the

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blurriness-is-better effect. Lastly, in Study 6, we intended to show the boundary condition of our suggested blurriness-is-better effect.

Study 1

In Study 1, we tested whether including a moderately blurred rather than a high-resolution image of a victim in a donation appeal would be more effective in raising donations (H1). We also explore several donor-related characteristics that could influence the effect of victim image blurriness on donation amount regarding donors' perceived similarity with victim.

Methods

Participants and Design

One hundred and three participants were recruited from an online panel (Amazon Mechanical Turk) and participated in the study for a nominal payment. We removed four participants with duplicate IP addresses and four participants who indicated that they looked up information about the charity on the Internet while participating in the study. Thus, the total sample included 95 participants (37.9% female; ages 19 to 71, $M_{age} = 34.28$, $SD = 10.79$; 80.0% White). The participants were randomly assigned to one of two between-subjects conditions, high-resolution victim image and blurred victim image.

Procedure

Participants were shown one of the two donation appeals (high-resolution vs. blurred) on a computer screen. The charitable cause and the name of the charity used in this study were adapted from Bagozzi and Moore's (1994) past research. In the donation

appeals, we described that a charity named Society for the Prevention of Cruelty to Children supports children who suffer from domestic child abuse. In the donation appeal, an image of a sad-looking White boy was located at the top, and the description of the charitable cause and the name of the charity was placed at the bottom.

The high-resolution image condition presented an image of a sad-looking boy (Caucasian). In order to meet the criteria of a high-resolution image, the selected image was 300 ppi (pixels per inch) with dimensions of 3071×3071 pixels. This image of a boy was taken from a royalty-free stock image website. In the blurred image condition, on the contrary, we used Gaussian Blur Image Processing to make the spatial resolution (e.g., boundaries between objects) of the image less clear. The standard deviation (σ) representing Gaussian blur image processing was 0 for a high-resolution image ($\sigma = 0$) and 8 ($\sigma = 8$) for a blurred image. Note that the image in the blurred condition was still sufficiently discernable to convey the content of the image (see Appendix A).

The dependent measure was the hypothetical donation amount. Participants in both conditions were asked the following questions: "*If you had $30 on you, how much would you donate to the charity*?" Participants were asked to report their donation amount on a slider scale anchored by $0 and $30 at the two ends. As a manipulation check for the manipulation of image blurriness, participants were asked: "*How would you describe the sharpness of the image used in the donation appeal*?" (anchored: 1 = not at all sharp; 7 = very sharp), and "*How would you describe the clarity of the image used in the donation appeal*?" (anchored: 1 = not at all clear; 7 = very clear). Lastly, participants answered several demographic questions and were thanked for their participation.

Results

Manipulation Check

Independent samples *t*-tests showed that participants rated the image in the high-resolution condition as both sharper (M_{HR} = 5.81, SD = 1.28 vs. M_{BL} = 4.38, SD = 1.65; $t(93)$ = 4.72, p < .0001) and clearer (M_{HR} = 6.02, SD = 1.18 vs. M_{BL} = 4.89, SD = 1.45; $t(93)$ = 4.17, p < .0001) than those of the blurred condition. These results suggested that the manipulation of victim image blurriness was effective.

Donation Amount

The independent samples *t*-test found that participants in the blurred image condition donated significantly more money than did those in the high-resolution image condition (M_{HR} = $7.81, SD = 1.11 vs. M_{BL} = $11.70, SD = 1.49; $t(93)$ = 2.10, p = .038); see Figure 2.

Figure 2. Image Blurriness Main Effect from Study 1 (Donation Amount in $)
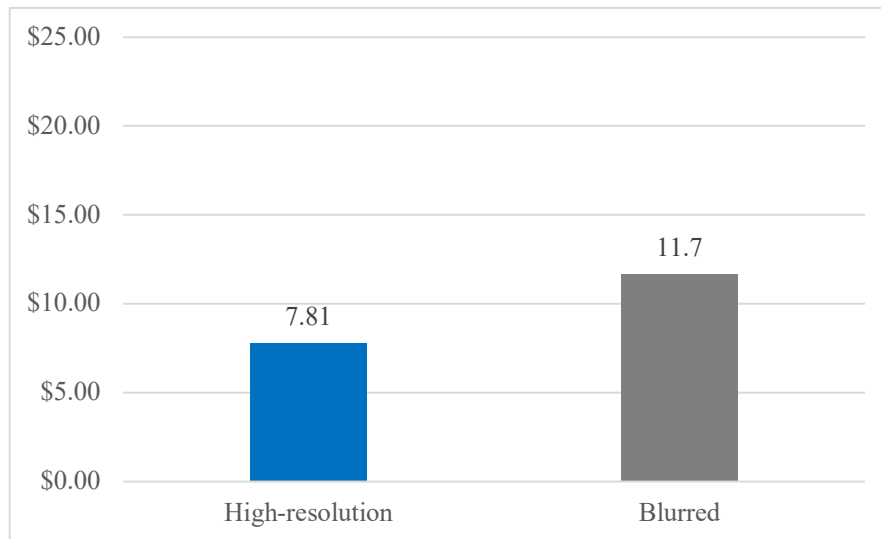
We also ran a one-way ANCOVA with participants' gender, age, ethnic background, education level, and income as covariates. The analysis found a significant main effect of victim image blurriness such that participants in the blurred image condition donated more than did those in the high-resolution image ($F(1, 88) = 4.75$, $p = .032$). Of the covariates, there was only a significant main effect of participants' gender showing that female participants in general donated more than male participants ($F(1, 88) = 12.85$, $p < .001$). No other covariate had any significant effect ($ps > .27$).

Since the vast majority of the participants were White (80.0%), we ran additional analyses by focusing the White participants to see whether the perceived similarity between donor and victim (i.e., ethnic background) influenced the outcome. An independent samples t-test found that participants in the blurred image condition donated significantly more money than those in the high-resolution condition ($M_{HR} = \$6.84$, $SD = 1.05$ vs. $M_{BL} = \$11.76$, $SD = 1.63$; $t(74) = 2.54$, $p = .013$).

To test whether the perceived dissimilarity (i.e., donor-victim gender mismatch) enhances the blurriness-is-better effect, we further conducted a 2 (donor gender: male vs. female) × 2 (victim image blurriness: high-resolution vs. blurred) ANOVA on donation amount. The result revealed a significant main effect of donor gender ($F(1, 72) = 21.74$, $p < .0001$), with female participants donating more money than male participants, a significant main effect of victim image blurriness ($F(1, 72) = 11.56$, $p < .01$), and a significant donor gender × victim image blurriness two-way interaction ($F(1, 72) = 4.75$, $p = .032$). The two-way interaction showed that female participants donated significantly more money in the blurred condition than in the high-resolution condition ($M_{HR} = \$9.57$, $SD = 6.11$ vs. $M_{BL} = \$19.29$, $SD = 9.73$; $F(1, 72) = 12.33$, $p < .001$), whereas male

participants donated a similar amount of money regardless of victim image blurriness (M_{HR} = \$5.25, SD = 6.24 vs. M_{BL} = \$7.38, SD = 7.36; $F(1, 72)$ = 1.01, p > .31); see Figure 3.

Figure 3. Gender × Image Blurriness Interaction (Donation Amount in \$)
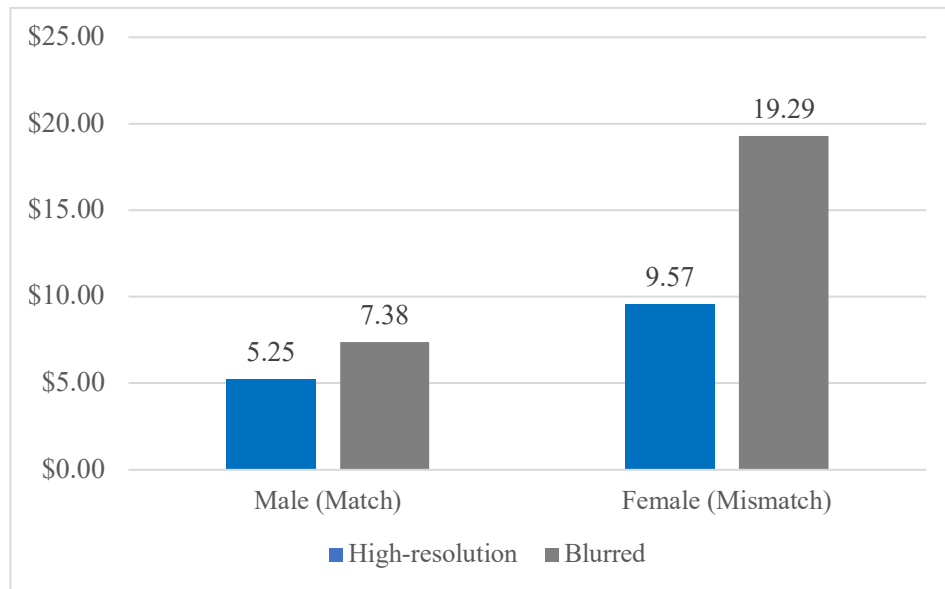
Because there were only a small number of non-White participants in the sample (n = 19), it was difficult to run reliable analyses with the non-White participants. However, the pattern of the results suggested that non-White participants donated a similar amount of money regardless of victim image blurriness (M_{HR} = \$11.50, SD = 3.42 vs. M_{BL} = \$11.44, SD = 3.87).

Discussion

The results of Study 1 provided initial evidence that showing a moderately blurred rather than a high-resolution image of a sad-looking victim in a donation appeal can lead to a higher donation amount. The results also suggest a similarity effect; when there was

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an ethnicity match between donor and victim, participants donated more when the victim image was blurred than when the image was high resolution, thus supporting hypothesis H3a.

On the contrary, when we focused on White participants (i.e., high perceived similarity; donor-victim ethnicity match) and tested the effect of donor-victim gender dissimilarity, the blurriness-is-better effect seems to be stronger among female donors (opposite gender) than among male donors (same gender), thus supporting H3b. Note that in this study, the ethnicity of the victim was also White. In the subsequent studies, we further test this blurriness-is-better effect and examine the conditions under which it is more likely to occur.

Study 2

Study 2 had two objectives. One objective was to replicate the basic findings of Study 1. That is, a moderately blurred image of a victim can bring about increased donation outcomes compared to a high-resolution image of a victim. However, Study 2 extended Study 1 by including a control condition in which the donation appeal does not include any victim image. In this control condition, we included only the description of the charitable cause and the name of the charity. This control condition served as another benchmark for evaluating the blurriness-is-better effect.

Another objective of this study was to explore the possible moderating role of the social distance of the victims (i.e., nationality). In Study 1, the participants who resided in the United States were told that the victims were in the United States. A question is whether this pattern of results held when the participants were told that the victims are in

a foreign country. In addition, we tested whether perceived dissimilarity in ethnic background or gender serves as moderators of the blurriness-is-better effect.

Methods

Participants and Design

A total of 300 online participants were recruited from an online panel (Amazon Mechanical Turk) and participated in the study for a nominal payment. We removed nine data points with duplicate IP addresses and thirty-eight participants who did not pass an attention check. We also excluded four people who had experienced problems while participating in the study (e.g., Internet connection failure) and one participant who did not identify gender information. As a result, the final sample included three hundred and eleven participants (47.6% female; ages 18 to 77, $M_{age} = 37.22$, $SD = 11.77$; 78.8% White).

The design of the study was a 3 (image: high-resolution vs. blurred vs. control) × 2 (victim nationality: US vs. Ukraine) between-subjects design. The donation appeal was similar to that of Study 1, but this time, we manipulated the victim's nationality by mentioning that "Each day in the US (vs. Ukraine), it is estimated that more than 5 children die as a result of child abuse." Also, we added a control condition in which the donation appeal did not include any victim image (i.e., text-only donation appeals).

Procedures

The procedure was similar to that of Study 1. The dependent measure was the donation amount. Participants answered the same donation amount question as used in Study 1. Afterward, participants were asked to rate the aesthetic aspect of the donation

appeal: "The image of the donation appeal is: 1 = Not at all aesthetic, 7 = Very aesthetic."

This was to rule out an alternative explanation that the blurred victim image looked more

aesthetic to the participants than the high-resolution victim image, consequently leading

to a greater donation amount. Participants also answered the same manipulation check

questions for the manipulation of image blurriness as those used in Study 1. Lastly, we

collected participants' demographic information.

Results

Manipulation Check

A 2 (victim image blurriness) × 2 (victim nationality) ANOVA on the composite

score of image clarity rating and sharpness rating ($r = .85$) showed only the significant

main effect of image blurriness ($F(1, 200) = 21.49$, $p < .001$). The main effects of victim

nationality and the victim image blurriness × victim nationality interaction were not

significant ($ps > .12$). As expected, participants rated the high-resolution image as sharper

and clearer ($M_{HR} = 5.87$, $SD = 1.15$) than the blurred image ($M_{BL} = 5.08$, $SD = 1.27$).

Donation Amount

A 3 (image) × 2 (victim nationality) ANCOVA conducted on the donation

amount with gender and age as covariates showed that only the main effect of image

blurriness was significant ($F(2, 303) = 5.44$, $p = .005$). Participants indicated the highest

donation amount in the blurred image condition ($M_{BL} = 13.72$, $SD = 9.94$) followed by

the control condition ($M_{control} = 10.77$, $SD = 8.63$) and the high-resolution condition (M_{HR}

$= 9.63$, $SD = 9.45$). The main effect of victim nationality and the two-way interaction

were not significant ($ps > .23$). Also, none of the covariates showed any significant effect ($ps > .19$).

Figure 4. Image Blurriness Main Effect from Study 2
(Donation Amount in $)
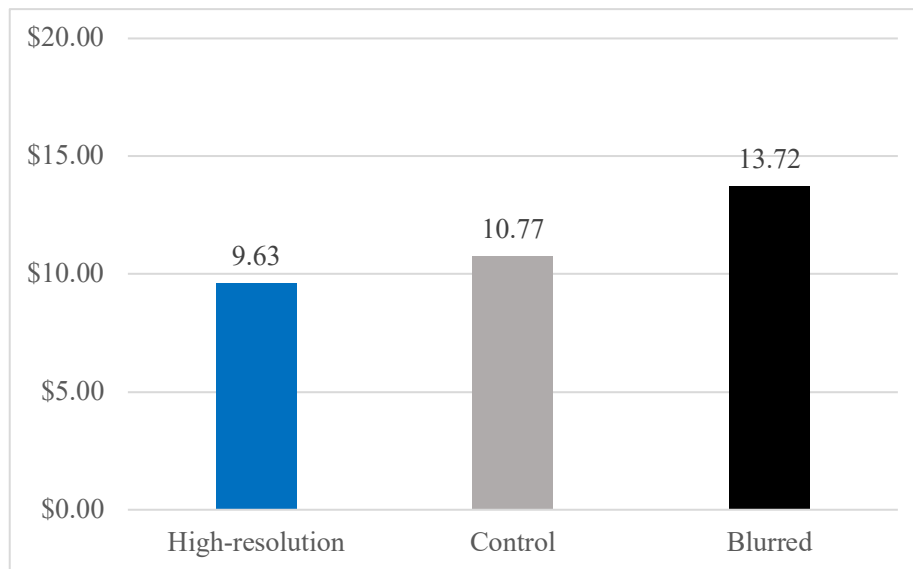
Because there was no significant effect of victim nationality, we collapsed the data across two nationality conditions and conducted a one-way ANOVA on donation amount without any covariates and tested the effect of image blurriness. The results showed a significant main effect of image blurriness ($F(2, 308) = 5.21, p = .006$). The direction was such that when the victim image was blurred, participants donated a higher amount of money ($M = 13.72, SD = 9.94$) than when the image was high-resolution ($M = 9.63, SD = 9.45$) or when there was no victim image ($M = 10.77, SD = 8.63$); see Figure 4. A post-hoc comparison showed that the difference between the blurred image and the control condition was marginally significant ($p = .06$), and the difference between the blurred image and high-resolution image was significant ($p = .005$). The difference between the high-resolution image and the control condition was not significant ($p = .65$).

White Participants: Donor-Victim Ethnicity Match

As in Study 1, since the majority of the participants were white (78.8%), we ran additional analyses focusing on them. We ran a 3 (image) × 2 (victim nationality) ANCOVA on the donation amount with the age and gender as covariates. The analysis found only a marginal main effect of image blurriness ($F(2, 237) = 2.50$, $p = .084$). Participants indicated the highest donation amount in the blurred image condition ($M_{BL} = 12.72$, $SD = 9.91$), followed by the high-resolution condition ($M_{HR} = 10.03$, $SD = 9.30$) and the control condition ($M_{control} = 9.92$, $SD = 8.60$). The main effect of victim nationality and the two-way interaction were not significant ($Fs < 2.54$, $ps > .11$). Also, none of the covariates had any significant effects *($Fs < .75$, $ps > .38$).*

To test whether the perceived dissimilarity influenced the blurriness-is-better effect, we selected the US victim conditions only and conducted a 3 (image) × 2 (donor gender) ANOVA on donation amount. The result found only a significant main effect of victim image blurriness, such that participants indicated the highest donation amount in the blurred image condition ($M_{BL} = 14.70$, $SD = 10.24$) followed by the control condition ($M_{control} = 12.00$, $SD = 8.06$) and the high-resolution condition ($M_{HR} = 10.03$, $SD = 9.30$; $F(2, 149) = 4.58$, $p = .012$). No other effects were significant ($Fs < .56$, $ps > .57$). Importantly, however, the pattern showed that female participants indicated the highest donation amount when the blurred victim image was used ($M_{BL} = 15.60$, $SD = 10.69$) compared with no victim image use ($M_{control} = 10.96$, $SD = 8.77$) and high-resolution image use ($M_{HR} = 9.25$, $SD = 8.35$; $F(2, 149) = 3.41$, $p = .036$). The post-hoc comparison showed that the difference between high-resolution condition and blurred condition was significant ($p = .012$), and the difference between the high-resolution condition and the

control condition was marginally significant ($p = .07$). In terms of male participants, they donated more money when the blurred image of a victim was used ($M_{BL} = 13.80$, $SD = 9.90$) than when the high-resolution image was used ($M_{HR} = 9.29$, $SD = 8.74$), but the difference was marginal ($p = .082$). Other differences were not significant ($ps > .15$); see Figure 5.

Figure 5. US Victims Result in Study 2
(Donation Amount in $)
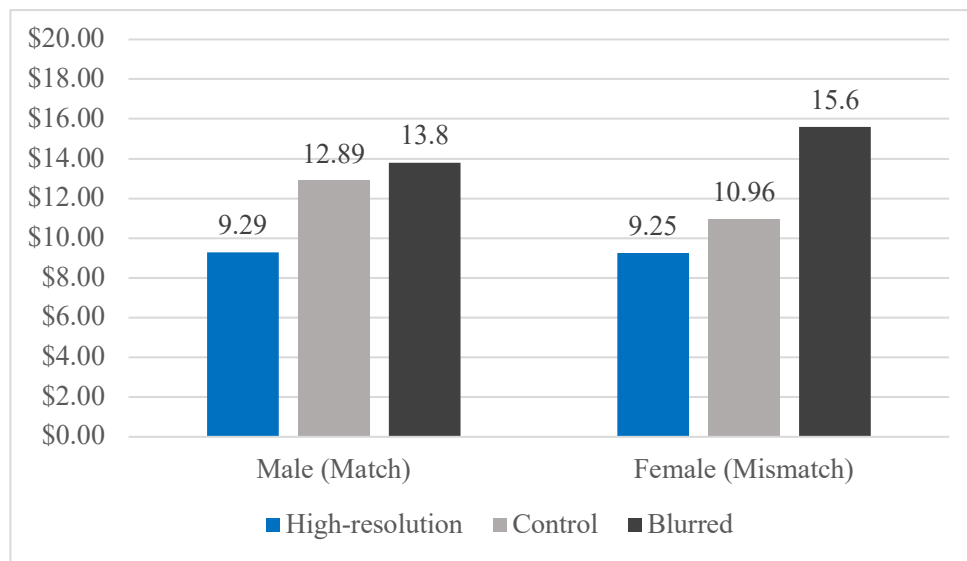
Aesthetics Rating

A 3 (image) × 2 (nationality) ANOVA on the aesthetic rating found neither significant main effects nor interaction effects ($Fs < 2.17$, $ps > .14$). The aesthetics ratings did not differ significantly across the image conditions.

Discussion

The results showed that a moderately blurred image of a victim yielded the highest donation amount compared to the control, which does not have any victim image,

and the high-resolution victim image. Also, we ruled out possibility that the blurred version of the donation appeal is visually more aesthetic and thus caused higher donations. As shown in the results, there was no significant difference in aesthetics ratings between the high-resolution and blurred versions of donation appeal.

Furthermore, we found that the victim's nationality described in the donation appeal did not influence the blurriness-is-better effect. Instead, when the donor and victim ethnicity (i.e., White/Caucasian) and nationality (i.e., the United States) were in match, female participants donated a higher amount of money to the opposite gender victim (gender mismatch; dissimilar) when the victim image was blurred than when it was high resolution. This pattern was also shown in male participants, but the significance was marginal. Thus, in Studies 1 and 2, we showed that when there is a perceived dissimilarity between donor and victim (i.e., gender mismatch), the blurriness-is-better effect was stronger (H3b). In the next study, we generalize our findings in a real-world setting and replicate the findings in previous studies.

Study 3

The main purpose of this study was to examine whether the blurriness-is-better effect can be found when real donations are involved. To test this, we gave participants a bonus for completing a filler task, showed them a donation appeal, and asked them if they would like to donate part of their bonus to help the charitable cause. Another purpose of this study was to further examine the potential moderating role of victim nationality, as in Study 2.

Method

Participants and Design

One hundred and sixty-one Amazon Mechanical Turk workers participated in the study for a nominal payment. Ten participants decided not to participate in the survey after the filler task and thus were removed for future analyses. Also, we removed 3 data points with duplicate IP addresses and 22 participants who indicated that they looked on the Internet for information on the charity, and two participants who did not identify their gender. Thus, the final sample included 124 participants (38.7% female; ages 18 to 76; M_{age} = 35.66; 85.4% White).

The study had a 2 (victim nationality: US vs. Ukrainian) × 2 (victim image blurriness: high-resolution vs. blurred) × 2 (donor gender: male vs. female) mixed design, with the first two factors manipulated between participants and the last factor measured. The visual design of the donation appeals was similar to that of Study 1 and Study 2.

Procedures

Participants were recruited to participate in a seemingly unrelated filler task (i.e., evaluating healthy and unhealthy food products; the order of the food product evaluation tasks was randomized). At the end of the filler survey, after answering several demographic questions, the participants were told that there would be a bonus survey and asked if they would like to participate in this bonus survey for additional monetary compensation ($1).

For the participants who agreed to participate in this bonus survey, a donation appeal was shown, which was identical to that used in Study 1 and Study 2. We used the same charitable cause, victim image, and we manipulated the blurriness of the victim image in the same way. Also, half the participants were told that the victims were in the United States; the other half were told that the victims were in Ukraine. Participants were asked to indicate how much of their $1 bonus they would like to donate to the charitable organization to help the victims, on a slider scale anchored by 0 cents and 100 cents. After that, participants answered several additional questions and were thanked for their participation.

Results

Donation Amount

A 2 (image blurriness) × 2 (victim nationality) × 2 (donor gender) ANOVA on the donation amount found a significant main effect of victim nationality ($F(1,116) =$ 4.56, $p = .035$), a significant victim nationality × victim image blurriness two-way interaction ($F(1,116) = 4.38, p = .038$), a significant donor gender × victim image blurriness two-way interaction ($F(1,116) = 15.09, p = .002$), and a significant three-way interaction ($F(1, 116) = 5.12, p = .026$). No other effects were significant (Fs < 1.15, ps > .28).

We unpacked the three-way interaction by examining the donor gender × victim image blurriness two-way interaction in the US victim and Ukrainian victim conditions separately. In the US victim condition, there was a significant donor gender × victim image blurriness two-way interaction ($F(1, 116) = 7.56, p = .0001$). The male participants

donated significantly more money when the victim image was high-resolution than when it was blurred ($M_{HR} = 54.14$ cents, $SD = 33.22$ vs. $M_{BL} = 14.23$ cents, $SD = 20.97$; $F(1,116) = 16.10$, $p = .0001$). In contrast, female participants donated significantly more money when the victim image was blurred than when it was high-resolution ($M_{HR} = 23.46$ cents, $SD = 35.16$ vs. $M_{BL} = 50.29$ cents, $SD = 31.92$; $F(1,116) = 5.24$, $p = .024$).

In the Ukraine victim condition, there was no significant donor gender × victim image blurriness two-way interaction ($F(1, 116) = 1.87$, $p > .13$). Female participants still donated significantly more money when the victim image was blurred than when it was high-resolution ($M_{HR} = 7.00$ cents, $SD = 13.38$ vs. $M_{BL} = 32.00$ cents, $SD = 27.20$; $F(1, 116) = 4.17$, $p = .043$). Even male participants donated slightly more money when the victim image was blurred than when it was high resolution, but the difference was not significant ($M_{HR} = 24.68$ cents, $SD = 32.09$ vs. $M_{BL} = 32.06$ cents, $SD = 31.52$; $F(1, 116) < 1$, $p > .42$); see Figure 6.

Figure 6. Image Blurriness × Victim Nationality × Donor Gender
Three-way Interaction in Study 3 (Donation Amount in cents)

Ukraine Victims
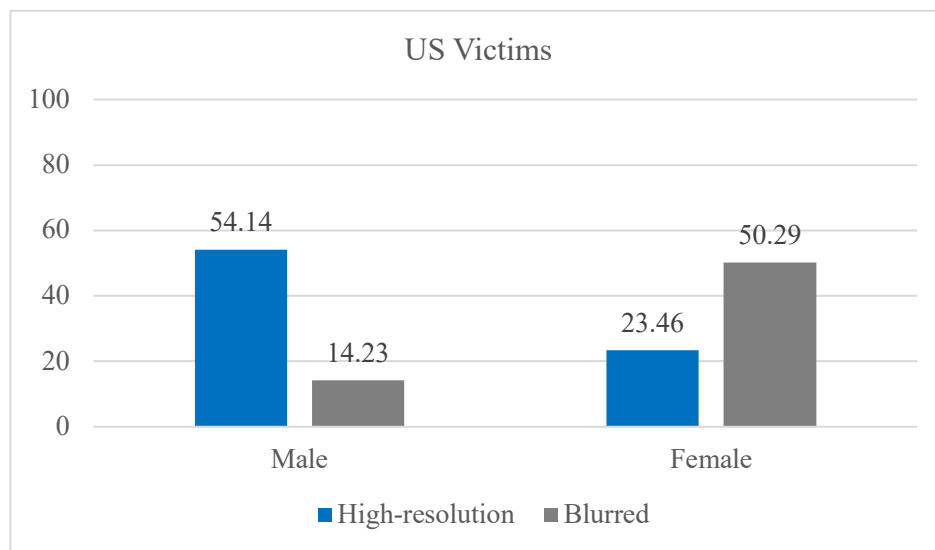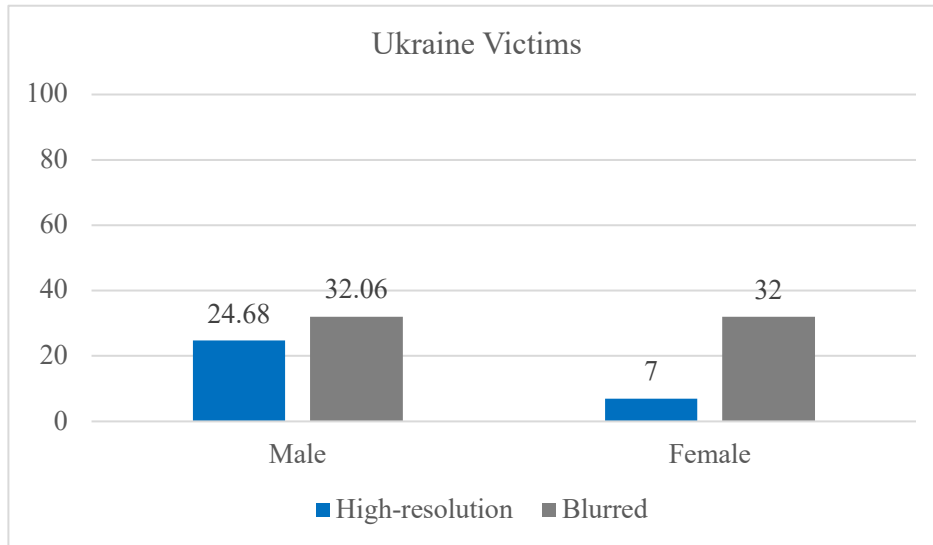
Looked at it another way, among the male participants, there was a significant victim nationality × victim image blurriness two-way interaction ($F(1, 116) = 5.60$, $p = .0013$). When the victim image was high-resolution, they donated significantly less money when the victims were described as from Ukraine ($M = 24.68$ cents, $SD = 32.09$) than when they were described as from the United State ($M = 54.14$ cents, $SD = 33.22$; $F(1, 116) = 8.77$, $p < .004$). When the victim image was blurred, they donated marginally more money when the victims were described as being from Ukraine ($M = 32.06$ cents, $SD = 31.52$) than when they were described as being from the US ($M = 14.23$ cents, $SD = 20.97$; $F(1 , 116) = 3.72$, $p = .056$). Among the female participants, there was also a significant victim nationality × victim image blurriness two-way interaction ($F(1, 116) = 4.56$, $p < .005$), but the pattern was in the opposite direction. When the victim image was high-resolution, the pattern indicated that female participants donated slightly more money when the victims were described as from Ukraine ($M_{US} = 23.46$ cents, $SD = 35.16$ vs. $M_{Ukraine} = 7.00$ cents, $SD = 13.38$; $F(1,116) = 1.68$, $p > .19$), whereas when the victim image was blurred, the female participants donated slightly more money when the

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victims were described as being from the United States (M_{US} = 50.29 cents, SD = 31.92 vs. $M_{Ukraine}$ = 32.00 cents, SD = 27.20; $F(1, 116)$ = 2.66, p > .10).

Additionally, we ran analyses to examine any potential moderating role of donor ethnicity. A 2 (donor ethnicity: White vs. non-White) × 2 (victim country) × 2 (victim image blurriness) ANOVA on donation amount found no significant results (Fs < 1.26, ps > .26), and a 2 (donor ethnicity: White vs. non-White) × 2 (donor gender) × 2 (victim nationality) × 2 (victim image blurriness) ANOVA on donation amount found a significant donor gender × victim image blurriness two-way interaction ($F(1, 108)$ = 5.41, p = .022). No other effects were found to be significant (Fs < 1.26, ps > .26). Importantly, the donor gender × victim country × victim image blurriness three-way interaction was no longer significant ($F(1, 108)$ = 2.46, p > .11).

Donation Decision

We also analyzed the proportion of participants in each condition who made a positive donation (i.e., donation amount > 0 cents). A logistic regression found a significant donor gender × victim image blurriness two-way interaction (B = - 4.75, chi-square = 8.27, p = .004). The three-way interaction was not significant (p > .10) and no other interaction effects were significant. The main effect of victim image blurriness approached significance (B = 2.00, chi-square = 2.74, p = .098). The main effect of donor gender also approached significance (B = 2.00, chi-square = 2.74, p = .098). Among the male participants, more participants donated some money when the victim picture was high-resolution (72.2%) than when it was blurred (57.5%). Among the female participants, however, more donated some money when the victim picture was blurred (85.2%) than when it was high-resolution (47.6%); see Figure 7.

Figure 7. Donation Decision in Study 3 (in percentage)
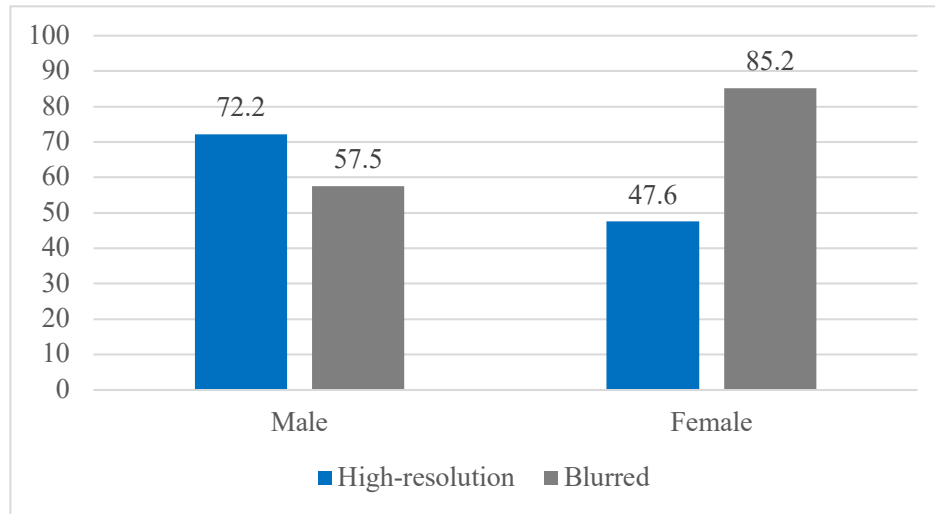
Discussion

Consistent with the findings in Study 1 and Study 2, we found a significant donor gender × victim image blurriness two-way interaction, such that female participants show blurriness-is-better effect and donated more money when the victims were in the United States. Similarly, when we considered donors' decisions to donate, we found that overall, female participants were more likely to donate when the victim image was blurred than when it was high-resolution. Again, note that the victim image used in this study was a sad-looking White/Caucasian boy. The results from Study 1–Study 3 suggest that the perceived dissimilarity in gender (i.e., gender mismatch between a donor and a victim) enhances the blurriness effect when the ethnic background is controlled.

Study 4

In Study 4, we used a victim image and a charitable cause that were different from those used in the previous studies. In Study 1–Study 3, we used the same image of a sad-

looking White/Caucasian boy in a black and white color scheme. In this study, by using a color victim image, we wanted to show that the blurriness-is-better effect also holds for the colored images.

Furthermore, while we used images of a White boy in our previous studies, in this study, we used an image of a Black/African boy. Also, we intentionally recruited participants for form a balanced ethnicity/gender group, allowing us to show that our effect is not limited to situations involving White/Caucasian victims. In addition, we identified a potential mediator, perceived cause involvement in the relationship between victim image blurriness and donation amount when there was a perceived dissimilarity between a donor and a victim (i.e., mismatch in donor-victim gender).

Method

Participants and Design

Two hundred and forty-four participants were recruited from an online panel (Prolific) and participated in the study in exchange for $1. We requested that the participants reside in the United States. We removed two participants with duplicate IP addresses and six participants who indicated that they looked up information about the charity on the Internet while participating in the study. Thus, the final sample included 236 participants (46.2% female; ages 18 to 69, $M_{age} = 34.02$, $SD = 12.46$; 51.7% White or Caucasian American, 48.3% Black or African American). The participants were randomly assigned to one of four conditions in a 2 (victim nationality: US vs. Africa) × 2 (victim image blurriness: high-resolution vs. blurred) between-subjects factorial design.

Procedure

Participants who agreed to participate in our study were shown a donation appeal on the computer screen. The donation appeal consisted of a large photo of a sad-looking Black boy, with a verbal description of the cause right beneath the picture (see Appendix B). In the donation appeal, we described that the charity "Child Cancer Fund" is looking for donors to support children who are diagnosed with cancer. The charitable cause and the logo of the charity were adopted from https://childcancerfund.org/, and the victim image was adopted from a royalty-free stock image website. As in previous studies, we manipulated the sharpness of the victim image using Gaussian Blur Image Processing. In addition, we manipulated the nationality of the victims: half the participants were told that the victims were in the United States, while the other half were told that the victims were in Africa.

The dependent measure was donation amount. Participants were asked to indicate on the same \$0–\$30 slider scale the amount of money they would be willing to donate to the charitable cause. Later, we administered the scale measuring cause involvement. The scale included two items: "*The charitable cause is important to me*" (anchored: 1 = not at all; 7 = very much) and "*The charitable cause is personally relevant to me*" (anchored: 1 = not at all; 7 = very much), and the items were adopted from the past studies (Grau & Folse, 2007; Maheswaran & Meyers-Levy, 1990). At the end, participants answered two image blurriness manipulation check items and demographic questions.

Results

Manipulation Check

Independent samples *t*-tests showed that participants rated the high-resolution victim image as both sharper ($M_{HR} = 5.75$, $SD = 1.26$ vs. $M_{BL} = 3.08$, $SD = 1.65$; $t(234) = 13.892$, $p < .0001$) and clearer than the blurred victim image condition ($M_{HR} = 6.16$, $SD = 1.03$ vs. $M_{BL} = 3.70$, $SD = 1.64$; $t(234) = 13.74$, $p < .0001$). These results suggested that the manipulation of victim image clarity was effective.

We also averaged the ratings for the sharpness and clearness of the victim image ($r = .86$) to create an image sharpness index and submit it to a 2 (victim nationality) × 2 (victim image blurriness) ANOVA. The analysis found a significant main effect only for victim image blurriness ($F(1, 232) = 218.3$, $p < .0001$; other effects, Fs < 1.46, ps > .22). Participants rated the image in the high-resolution image condition as sharper ($M = 5.95$, $SD = 1.04$) than the image in the blurred image condition ($M = 3.39$, $SD = 1.56$). These results again confirmed that the manipulation of victim image blurriness was effective.

Donation Amount

A 2 (victim image blurriness) × 2 (donor gender) × 2 (donor ethnicity) ANOVA on the donation amount found a significant main effect of donor gender ($F(1, 228) = 5.97$, $p = .015$), a significant main effect of donor ethnicity ($F(1, 228) = 4.00$, $p = .047$), and a significant donor gender × victim image blurriness two-way interaction ($F(1, 228) = 7.03$, p < .01). No other effects were significant (ps > .25). In detail, female participants donated more money ($M = \$9.74$, $SD = 8.80$) than did the male participants ($M = \$7.06$, $SD = 7.99$). The Black /African American participants donated more money ($M = \$9.41$, $SD = 8.2$) than did the White/Caucasian participants ($M = \$7.26$, $SD = 7.90$).

Importantly, the donor gender × victim image blurriness two-way interaction showed that the male participants donated significantly more money when the victim

image was high-resolution than when it was blurred (M_{HR} = \$8.66, SD = 9.05 vs. M_{BL} = \$5.54, SD = 6.54; $F(1, 228)$ = 4.24, p = .041), whereas the female participants donated marginally more money when the victim image was blurred than when it was high-resolution (M_{HR} = \$8.41, SD = 8.74 vs. M_{BL} = \$11.05, SD = 8.74; $F(1, 228)$ = 2.96, p = .087). Looked at differently, when the victim image was high-resolution, participants' gender did not influence how much they donated ($F < 1$); in contrast, when the victim image was blurred, the female participants donated significantly more money than did the male participants ($F(1, 228)$ = 13.01, $p < .001$); see Figure 8.

Figure 8. Donor Gender × Image Blurriness Interaction in Study 4
(Donation Amount in $)
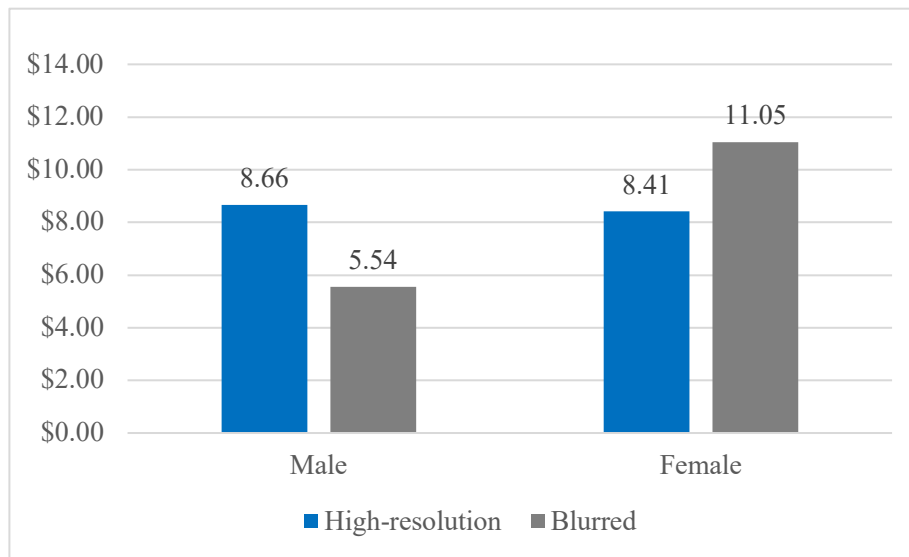
Moderated Mediation: Cause Involvement

As we predicted that the blurriness in victim image will enhance donors' perceived cause involvement (H2), we ran 2 (donor gender) × 2 (victim image blurriness) ANOVA on the composite score of cause involvement (r = .79). The result showed significant main effect of gender such that female participants indicated higher cause

involvement ($M = 4.38$, $SD = 1.58$) than the male participants ($M = 3.80$, $SD = 1.69$; $F(1,$ 232) = 7.26, $p = .008$). Also, 2 (donor gender) × 2 (victim image blurriness) two-way interaction was significant ($F(1, 232) = 4.70$, $p = .031$). For female participants, they indicated higher cause involvement when the image was blurred ($M = 4.75$, $SD = 1.48$) than when the image was high-resolution ($M = 3.99$, $SD = 1.59$; $F(1, 232) = 6.02$, $p =$ .015). On the contrary, male participants did not show a difference across the blurriness conditions ($M_{HR} = 3.88$, $SD = 1.73$ vs. $M_{BL} = 3.72$, $SD = 1.67$; $F(1, 232) = .29$, $p = .59$). Looked at differently, when the image was blurred, female participants showed higher cause involvement ($M = 4.75$, $SD = 1.48$) than male participants ($M = 3.72$, $SD = 1.67$; $F(1, 232) = 12.01$, $p = .001$). However, when the image was high resolution, there was no significant difference between genders ($M_{female} = 3.99$, $SD = 1.59$ vs. $M_{male} = 3.88$, $SD =$ 1.73; $F(1, 232) = .29$, $p = .59$).

To test the effect of perceived cause involvement as a mediator, we conducted a moderated mediation analysis using image blurriness as an independent variable (0 = high-resolution, 1 = blurred), donor gender as a moderator (0 = male, 1 = female), a composite score of perceived cause involvement as a mediator, and donation amount as a dependent variable. Using PROCESS (model 8; Hayes 2017) with 5000 bootstrap samples for bias-corrected bootstrap confidence intervals, the moderated mediation results showed that only when there was a perceived dissimilarity (i.e., a mismatch between donor and victim gender), cause involvement mediated the effect of image blurriness on donation amount ($b = 1.70$, $SE = .68$, 95% CI [.43, 3.12]). When there was no dissimilarity (i.e., the donor-victim gender matched), the mediation was insignificant ($b = -.44$, $SE = .69$, 95% CI [-1.82, .89]); see Figure 9 for the detailed results.

Figure 9. Moderated Mediation Model with Unstandardized b Coefficients (Standard Errors) in Study 4

Index of moderated mediation 95% CI [.2652, 4.1737]
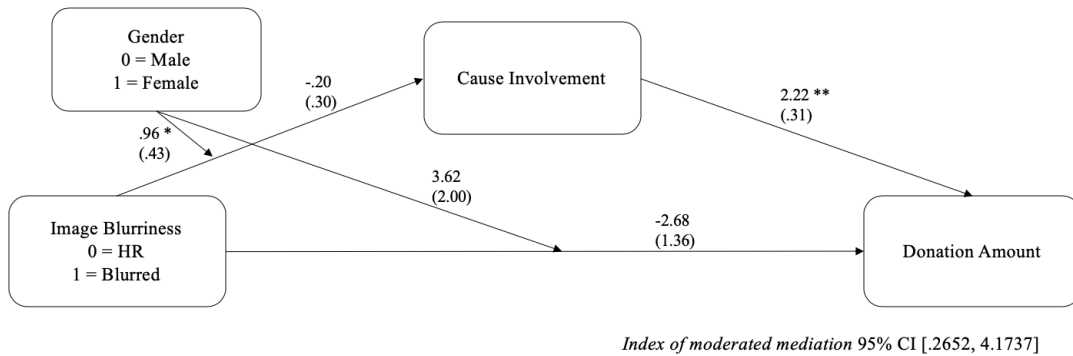
*p < .10, **p < .05

Discussion

From this study, we replicated previous findings of perceived dissimilarity (i.e., the donor-victim gender mismatch) effect. Dissimilarity existed when there was a mismatch between donor and victim gender. The blurriness-is-better effect was strengthened, especially among female participants. Also, we demonstrated that this effect is mediated by participants' perceived cause involvement, which leads to higher donation amounts. Thus, the results overall suggest that the high-resolution image makes participants notice the perceived dissimilarity between themselves and the victims (H3b). However, the perceived dissimilarity in terms of ethnic background did not show any effect.

Study 5

The goal of Study 5 is to directly test whether perceived dissimilarity in gender strengthens the blurriness-is-better effect. In this study, we examined this interaction using counterbalanced gender images of victims.

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In addition, we investigated whether participants indeed process blurred images of a victim more deliberately than when the victim image is high-resolution. To test this, we directly tracked participants' eye fixation on donation appeal to show that amount of time and effort put into processing the blurred victim image is significantly higher than the high-resolution victim image depending on the donor's perceived dissimilarity of a donor and a victim (i.e., donor-victim gender mismatch). Specifically, we predicted that when the victim image is blurred and the perceived dissimilarity exists (i.e., donor-victim gender is in a mismatch), participants will fixate longer to process the donation appeal and show a higher willingness to donate.

Lastly, we tested H2 with a more detailed prediction—only when there is a perceived dissimilarity (i.e., a donor-victim gender mismatch) will participants indicate a higher cause involvement when the victim image is blurred (vs. high resolution) and as a result, show a higher donation amount.

Method

Participants and Design

One hundred undergraduate students were recruited to participate in advertisement evaluation studies for credits. Two data points were removed due to participants' astigmatism, which leads to inaccurate measurement of their eye movement. Thus, the total sample size was ninety-eight (42.9% female; age 19 to 30, $M_{age} = 20.96$, $SD = 1.48$; 56.1% White). The design of the study was a 2 (victim image blurriness: high-resolution vs. blurred) × 2 (victim image gender: male vs. female) × 2 (donor gender:

male vs. female) mixed design, with the first two factors manipulated between participants and the last factor measured.

Procedures

For this study, we made two new donation appeals with ethnicity and gender-balanced images. We used an image of a sad-looking Caucasian American girl and a sad-looking African American boy. As in previous studies, the level of blurriness was manipulated by Gaussian blur image processing ranging from standard deviation levels 2 to 10, depending on the original size of the image. For the charitable cause, we selected and adopted an existing charity, the National Organization for Rare Disorders (https://rarediseases.org/), and described the suffering of children with rare diseases and how the charity helps and supports these children. To analyze participants' eye fixation, the image part and the text part of the donation appeal were selected as a separate Area of Interest (AOI). Appendix C shows the details.
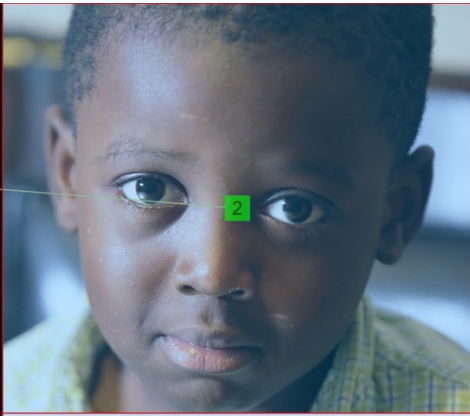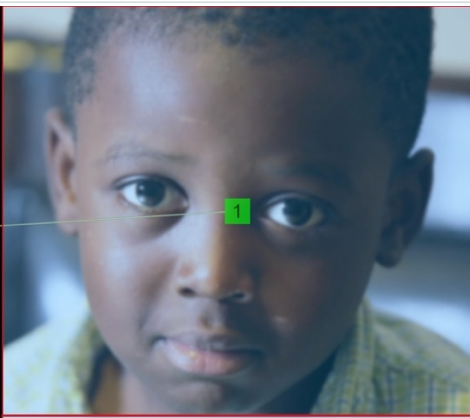
When participants arrived in the lab, the eye-movement calibration process was completed using a Tobii X2-30 eye tracker located on top of the computer screen. This process involved participants following a green dot moving on the screen to properly calibrate their eye movement. Following this, they completed an unrelated eye-tracking study (i.e., food product ad evaluation), and afterwards, they were told that they would view a donation appeal for 30 seconds and be asked to evaluate it. For both the high-resolution and blurred versions of the donation appeals, we exposed participants to a donation appeal for 30 seconds to make sure they processed the appeal for the minimum amount of time before moving on to the next step. After, we measured their willingness

to donate (slider scale: $0–$30), as in previous studies followed by the scale of perceived cause involvement, manipulation check, and demographic questionnaires.

Results

Manipulation Check

A 2 (victim image blurriness) × 2 (victim gender) × 2 (donor gender) ANOVA on the composite score of image clarity ($r = .88$) showed significant main effect of image blurriness ($F(1, 90) = 84.53$, $p < .001$). As expected, participants indicated that the high-resolution image was clearer ($M_{HR} = 5.28$, $SD = 1.29$) than the blurred image ($M_{BL} = 2.86$, $SD = 1.30$). Also, there was a marginally significant main effect of victim gender such that the image of African American boy was indicated as clearer and sharper than the image of the Caucasian American girl ($M_{AA} = 4.34$, $SD = 1.65$ vs. $M_{CA} = 3.86$, $SD = 1.86$; $F(1, 90) = 3.93$, $p = .05$). A marginally significant victim image blurriness × victim gender interaction showed that when the image was blurred, the image of an African American boy was indicated as sharper ($M_{AA} = 3.39$, $SD = 1.19$) than the image of a Caucasian American girl ($M_{CA} = 2.33$, $SD = 1.21$). When the image was high-resolution, there was no significant difference ($M_{AA} = 5.29$, $SD = 1.51$ vs. $M_{CA} = 5.26$, $SD = 1.09$; $F(1, 90) = 3.66$, $p = .059$). No other effects were found to be significant ($ps > .48$).

Donation Amount

A 2 (donor-victim gender match) × 2 (victim image blurriness) ANOVA conducted on the donation amount found only a significant two-way interaction ($F(1, 94) = 4.85$, $p = .03$). No other effects were significant ($Fs < 1.31$, $ps > .25$).

Figure 10. Image Blurriness × Donor-Victim Gender Match Interaction in Study 5
(Donation Amount in $)
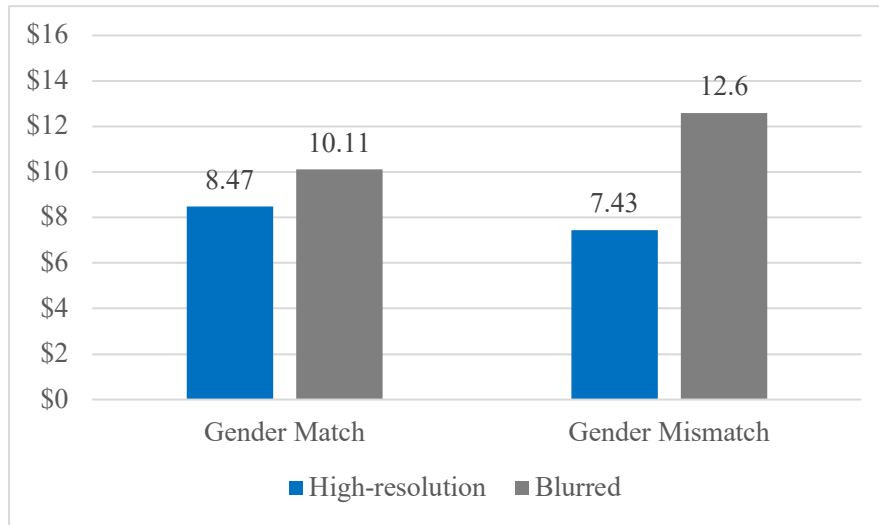
As predicted, when there was a perceived dissimilarity (i.e., donor-victim gender mismatch), participants were more willing to donate when the victim image was blurred (M_{BL} = $12.60, SD = 9.57) than when it was high-resolution (M_{HR} = $7.43, SD = 5.88; $F(1,94)$ = 5.50, p = .021). When there was a similarity (i.e., donor-victim gender match), however, victim image blurriness did not significantly influence their donation amount (M_{HR} = $8.47, SD = 6.34 vs. M_{BL} = $10.11, SD = 7.87; $F(1, 94)$ = .57, p > .45). Looked at differently, when the victim image was blurred, the donation amount was marginally higher when there was a perceived dissimilarity (i.e., donor-victim gender mismatch) rather than when there was similarity (M_{match} = $10.11, SD = 7.87 vs. $M_{mismatch}$ = $12.60, SD = 9.57; $F(1, 94)$ = 3.50, p = .064). However, when the victim image was high resolution, the difference between match and mismatch conditions did not differ significantly (M_{match} = $8.47, SD = 6.34 vs. $M_{mismatch}$ = $7.43, SD = 5.88; $F(1, 94)$ = 1.53, p = .219); see Figure 10.

Average Fixation Duration: Victim Image as AOI

A two-way ANOVA conducted on the average fixation duration (in milliseconds) revealed a significant donor-victim gender match × victim image blurriness two-way interaction ($F(1, 94) = 6.02, p = .016$) and a marginally significant main effect of donor-victim gender match ($F(1, 94) = 2.82, p = .096$). The main effect of victim image blurriness was not significant ($F(1, 94) = .92, p = .33$).

The donor-victim gender match × victim image blurriness two-way interaction pattern was such that when there was a perceived dissimilarity (i.e., donor-victim gender mismatch), participants were fixating more on the blurred victim image ($M_{BL} = 226.60$ms, $SD = 72.55$) than on the high-resolution victim image ($M_{HR} = 176.52$ms, $SD = 64.91$; $F(1, 94) = 8.39, p = .005$). However, when there was a similarity between donor and victim (i.e., donor-victim gender match), victim image blurriness did not influence their fixation duration ($M_{HR} = 187.89, SD = 84.73$ vs. $M_{BL} = 166.0$ms, $SD = 62.85$; $F(1, 94) = 1.13, p > .28$). Looked at differently, when the victim image was blurred, participants fixated on the blurred image more when the dissimilarity existed (i.e., donor-victim gender mismatch) than the similarity (i.e., donor-victim gender match) condition ($M_{match} = 166.00$ms, $SD = 62.85$ vs. $M_{mismatch} = 226.60$ms, $SD = 72.55$; $F(1, 94) = 8.39, p = .005$). On the contrary, when the victim image was high-resolution, perceived dissimilarity (i.e., donor-victim gender match/mismatch) did not significantly influence participants' fixation duration ($M_{match} = 187.89$ms, $SD = 84.73$ vs. $M_{mismatch} = 176.52$ms, $SD = 64.91$; $F(1, 94) = .306, p = .58$); see Figure 11.

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Figure 11. Image Blurriness × Donor-Victim Gender Match Interaction in Study 5
(in milliseconds; victim image as AOI)
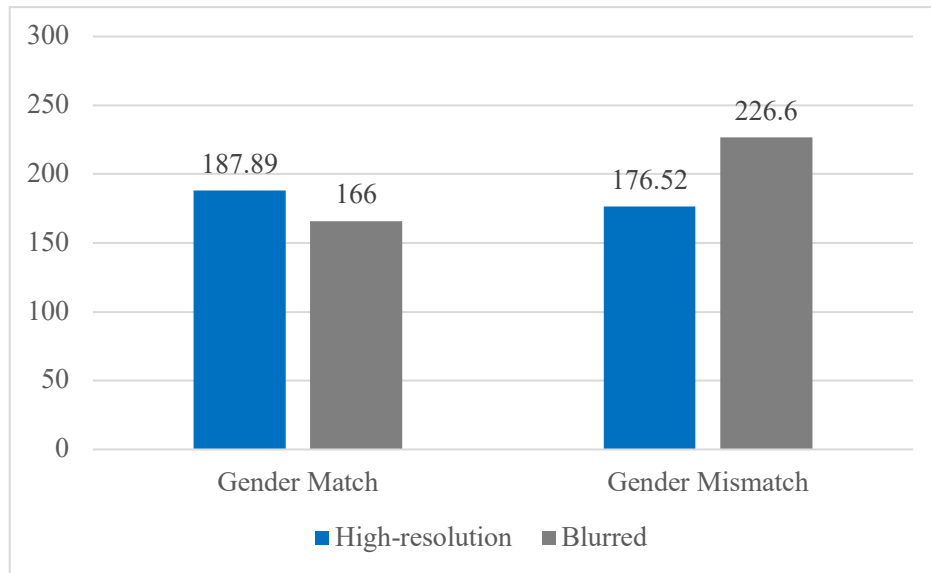
*Average Fixation Duration: Description of the Cause as AOI*

To see whether participants also fixated more on the description of the charitable

cause (i.e., text part of the donation appeal) depending on the victim gender and the

blurriness conditions, we conducted a 2 (donor-victim gender match) × 2 (victim image

blurriness) ANOVA on the participants' average fixation duration of the cause

description (in milliseconds). The results showed no significant main effects or the

interaction effect (Fs < 2.25, ps > .14).

Average Fixation Duration: Victim Image and Description of the Cause as AOIs

To test how participants' average fixation duration differed depending on victim

gender and the blurriness conditions, we additionally ran 2 (donor-victim gender match)

× 2 (victim image blurriness) ANOVA on the average fixation duration of the cause

description and the image. Thus, the dependent variable was the participants' average

fixation duration of the overall donation appeal.

The results showed that there was a marginally significant main effect of donor-victim gender match ($F(1, 94) = 3.55$, $p = 0.63$) and a marginally significant donor-victim gender match × victim image blurriness two-way interaction ($F(1, 94) = 2.88$, $p = .093$). Other effects were not significant. The nature of the interaction was such that when there was a donor-victim gender mismatch (therefore, perceived dissimilarity exists), participants fixated more on the donation appeal when the image is blurred ($M_{BL} =$ 409.20ms, $SD = 79.72$) than when the image was high-resolution ($M_{HR} = 355.87$ms , $SD = 76.92$), and the difference was marginal ($F(1, 94) = 3.68$, $p = .058$). On the contrary, when there was a donor-victim gender match (i.e., perceived similarity), the difference between image blurriness conditions was not significant ($M_{HR} = 352.26$ms, $SD = 121.87$ vs. $M_{BL} = 339.48$ms, $SD = 95.51$; $F(1, 94) = .22$, $p = .64$).

Figure 12. Image Blurriness × Donor-Victim Gender Match Interaction (in milliseconds; victim image and cause description as AOIs)
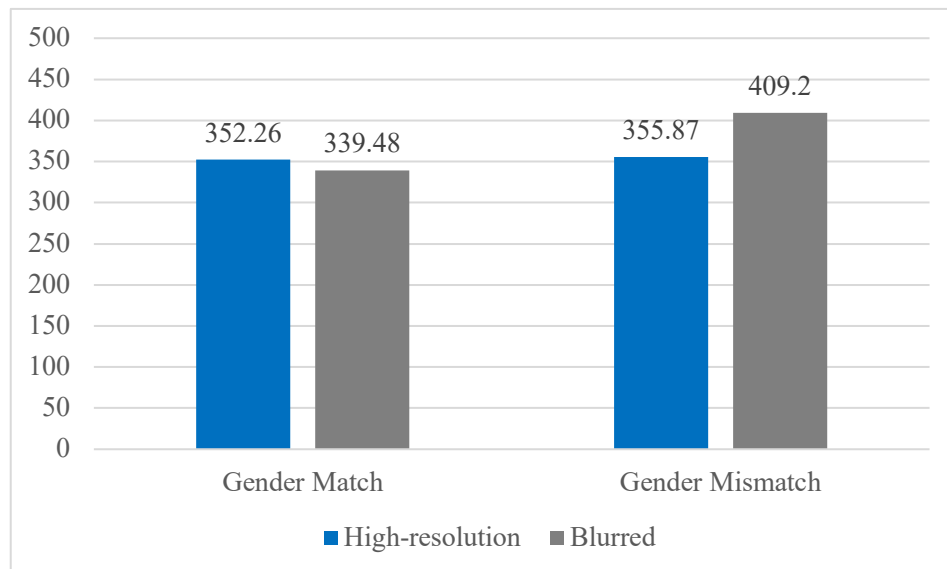
In terms of blurriness conditions, the results showed that when the victim image was blurred, individuals in donor-victim gender mismatch condition fixated more on the

donation appeal ($M_{mismatch}$ =409.20ms, SD = 79.72) than in the donor-victim gender match conditions (M_{match} = 339.48ms, SD = 95.51; $F(1, 94)$ = 6.30, p = .014). However, when the victim image was high-resolution, there was no difference across the donor-victim gender match/mismatch conditions (M_{match} = 352.26ms, SD = 121.87 vs. $M_{mismatch}$ = 355.87ms, SD = 76.92; $F(1, 94)$ = .02, p = .90); see Figure 12.

Total Time Spent: Victim Image as AOI

Another possible measure that tells us about how long participants processed the donation appeal is the total time spent. This measure indicates total fixation time spent in AOI, based on total duration of all respondent fixations. Too see how victim image blurriness and donor-victim dissimilarity jointly influenced total time spent looking at the victim image, we conducted a 2 (donor-victim gender match) × 2 (victim image blurriness) ANOVA on the participants' total time spent looking at the victim image.

The results indicated no significant main effects or the interaction effect (Fs < 1.81, ps > .18). However, the pattern showed that when there was a donor-victim gender mismatch, participants spent more time looking at the victim image when the victim image was blurred (M_{BL} = 2994.04ms, SD = 3183.13) than when the image was high-resolution (M_{HR} = 2028.48ms, SD = 1898.56; $F(1, 94)$ = 2.87, p = .093). No other effects were found to be significant (Fs < 2, ps > .16).

Total Time Spent: Description of the Cause as AOI

To test whether participants' total time spent for the cause description also differs depending on the image blurriness and donor-victim gender match, we also conducted a 2 (donor-victim gender match) × 2 (victim image blurriness) ANOVA on the participants'

total time fixated on the cause description (in milliseconds). The result showed no significant main effects or the interaction effect (Fs < 1.18, ps > .28).

Total Time Spent: Victim Image and Description of the Cause as AOIs

Lastly, we conducted a 2 (donor-victim gender match) × 2 (victim image blurriness) ANOVA on the participants' total time spent looking at the donation appeal. Thus, the dependent variable was the sum of time spent looking at the victim image and time spent looking at the cause description. The results showed that there was no significant main effect or an interaction effect (Fs < 2.17, ps > .14).

Moderated Mediation: Cause Involvement

To test the effect of image blurriness and donor-victim dissimilarity on perceived cause involvement (H2), we first conducted a 2 (donor-victim gender match) × 2 (victim image blurriness) ANOVA on the composite score of cause involvement (r = .64). The result showed only a significant 2 (donor-victim gender match) × 2 (victim image blurriness) two-way interaction ($F(1, 94)$ = 4.78, p = .031). No other effects were found to be significant (Fs < 2.63, ps > .11). The two-way interaction results showed that when there was a donor-victim gender mismatch, cause involvement was higher when the image was blurred (M = 3.62, SD = 1.66) than when the image was high-resolution (M = 2.67, SD = .98; $F(1, 94)$ = 7.12, p = .009). On the contrary, when there was a donor-victim gender match, there was no difference between the blurriness conditions (M_{HR} = 3.44, SD = 1.06 vs. M_{BL} = 3.30, SD = 1.06; $F(1, 232)$ = .16, p = .69). Looking at it another way, when the image was high-resolution, the donor-victim gender mismatch condition showed lower cause involvement (M = 2.67, SD = .98) than the donor-victim

gender match condition ($M = 3.44$, $SD = 1.06$; $F(1, 94) = 4.90$, $p = .029$). When the image was blurred, however, there was no significant difference across the conditions ($M_{match} = 3.30$, $SD = 1.06$ vs. $M_{mismatch} = 3.62$, $SD = 1.66$; $F(1, 94) = .79$, $p = .38$).

We further examined whether perceived cause involvement mediates blurred image to increase donation amount when there was a perceived dissimilarity (i.e., donor-victim gender mismatch). To test this, we ran moderated mediation analysis using image blurriness as an independent variable (0 = High-resolution, 1 = blurred), donor-victim gender match condition as a moderator (0 = match, 1 = mismatch), a composite score of perceived cause involvement as a mediator, and donation amount as a dependent variable. Using PROCESS (model 8; Hayes 2017) with 5000 bootstrap samples for bias-corrected bootstrap confidence intervals, the moderated mediation results showed that only when there was a perceived dissimilarity (i.e., mismatch between donor and victim gender), cause involvement mediated the effect of image blurriness on donation amount ($b = 1.96$, $SE = 1.03$, 95% CI [.25, 4.22]). When there was no perceived dissimilarity (i.e., donor-victim gender was in a match), the mediation was insignificant ($b = -.29$, $SE = .68$, 95% CI [-1.85, .88]). Figure 13 shows the detailed results.

Figure 13. Moderated Mediation Model with Unstandardized b Coefficients (Standard Errors) in Study 5

Index of moderated mediation 95% CI [.1646, 5.3039]
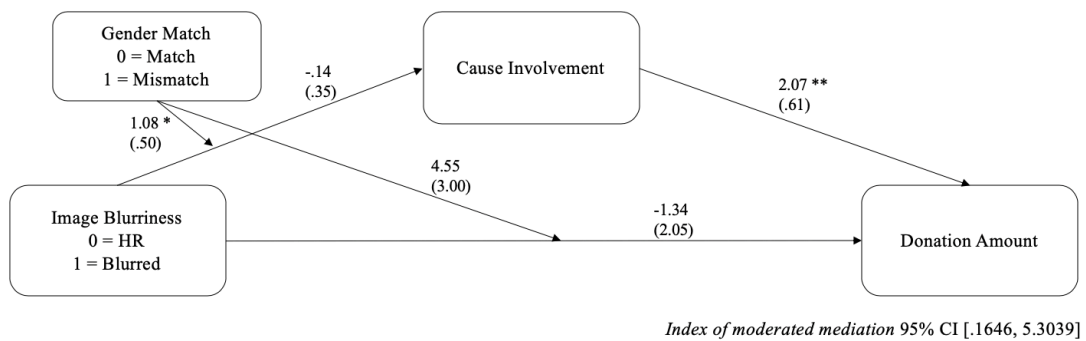
*$p < .10$, **$p < .05$

Perceived Dissimilarity in Ethnicity

Since the two victim images used different ethnicity groups, we ran additional 2 (donor-victim ethnicity: match vs. mismatch) × 2 (victim image blurriness: high-resolution vs. blurred) ANOVA on donation amount and average fixation duration. The results showed that 2 (donor-victim ethnicity match) × 2 (victim image blurriness) ANOVA on donation amount revealed no significant main effects nor interaction (Fs < .96, ps > .33). Similarly, 2 (donor-victim ethnicity match) × 2 (victim image blurriness) ANOVA on average fixation duration revealed no significant main effects or interaction effects (Fs < .78, ps > .37).

Discussion

From this study, we showed that participants donated more money when the victim image was blurred and there was perceived dissimilarity in gender (i.e., donor-victim gender mismatch). The donation amount result is consistent with what we found in the previous studies. That is, when there was a dissimilarity (i.e., mismatch) between the donor's gender and the victim's gender, the blurriness-is-better effect was effective. Furthermore, we also found that participants fixate to the victim image for a significantly longer period when the victim image is blurred than when it is high resolution if there is a perceived dissimilarity (i.e., donor-victim gender mismatch). This pattern was consistent for both average fixation duration and total time spent. Lastly, we showed that when the perceived dissimilarity exists and the victim image is blurred, participants indicate higher cause involvement and are thus willing to donate a higher amount of money.

Study 6

Study 6 had several objectives. A main goal was to identify boundary conditions and to examine the potential moderating role of the nature of the cause, heartbreaking versus uplifting. So far, the studies have focused on the situation where the cause involved is heartbreaking (i.e., child abuse, rare disease). The question is whether the same pattern will hold or will be reversed when the cause involved is uplifting (i.e., focusing on improving victims' lives). In Study 6, we addressed this question by holding the cause itself constant while manipulating the framing of the cause, heartbreaking versus uplifting. We tested the prediction that the blurriness-is-better effect found in previous studies would occur only when the heartbreaking cause (vs. uplifting cause) was presented (H4).

Method

Participants and Design

Two hundred and forty participants recruited from an online panel (Prolific) participated in the study for $1. We removed six participants who indicated that they had looked up information about the charity on the Internet while participating in the study. The final sample included 234 participants (51.3% female; ages 18 to 70, $M_{age} = 34.61$, $SD = 12.43$; 57.3% White, 42.7% non-White [Hispanic or Black/African American]). We requested that the participants reside in the United States and used a quota to counterbalance the ethnic background and gender of the participants. The participants were randomly assigned to one of four conditions in a 2 (type of cause: heartbreaking vs.

uplifting) × 2 (victim image blurriness: high-resolution vs. blurred) between-subject

design.

Procedure

As in the previous studies, participants were shown a donation appeal on a

computer screen. The main part of the appeal was a photo of a White girl. However, we

held the cause itself constant while manipulating its heartbreaking versus uplifting nature.

Also, we used different emotional expressions of this White girl for heartbreaking versus

uplifting charitable causes, respectively. An existing charity named Child Welfare

League of America (https://www.cwla.org/) was used to make donation appeals for this

study. The cause involved helping children and teenagers attend summer camps.

To manipulate framing of the charitable cause (heartbreaking vs. uplifting), in the

heartbreaking cause condition, the verbal description highlighted the negative situations

of the teenagers who wanted to attend summer camps, and the White girl appearing in the

donation appeal expressed a sad emotion. In the uplifting cause condition, on the

contrary, the verbal description highlighted the positive benefits of teenagers attending

summer camps, and the White girl appeared in the donation appeal was smiling (see

Appendix D for the details). Importantly, in this study, the girl appearing in both

conditions (heartbreaking vs. uplifting) was the same girl. To manipulate the blurriness of

the image, Gaussian Blur Image Processing was used.

The dependent measure was donation amount. Participants were asked to indicate

the amount of money they would be willing to donate to the charitable cause on the same

$0–$30 sliding scale. Then, we collected answers to the manipulation check items and

demographic questions.

Results

Manipulation Check

A 2 (type of cause) × 2 (victim image blurriness) ANOVA on the rating of image sharpness found a significant main effect of victim image blurriness ($F(1, 230) = 186.22$, $p < .0001$), a significant main effect of type of cause ($F(1, 230) = 5.19$, $p = .024$), and a significant two-way interaction ($F(1, 230) = 4.62$, $p = .033$). Participants rated the image in the high-resolution victim image condition as sharper than the image in the blurred victim image condition, regardless of whether the cause was heartbreaking ($M_{HR} = 5.85$, $SD = 1.07$ vs. $M_{BL} = 3.83$, $SD = 1.61$; $F(1, 230) = 67.23$, $p < .0001$) or uplifting ($M_{HR} = 5.83$, $SD = 1.19$ vs. $M_{BL} = 3.05$, $SD = 1.44$; $F(1, 230) = 122.66$, $p < .0001$).

A similar 2 × 2 ANOVA on the rating of image clarity found a significant main effect of image blurriness ($F(1, 230) = 138.09$, $p < .0001$), a significant main effect of type of cause ($F(1, 230) = 5.77$, $p = .017$), and a significant two-way interaction ($F(1, 230) = 7.43$, $p < .01$). Participants rated the image in the high-resolution victim image condition as sharper than the image in the blurred victim image condition, regardless of whether the cause was heartbreaking ($M_{HR} = 6.10$, $SD = 1.15$ vs. $M_{BL} = 4.56$, $SD = 1.45$; $F(1, 230) = 41.45$, $p < .0001$) or uplifting ($M_{HR} = 6.16$, $SD = 1.18$ vs. $M_{BL} = 3.68$, SD = 1.42; $F(1, 230) = 103.02$, $p < .0001$).

Donation Amount

A 2 (type of cause) × 2 (victim image blurriness) ANOVA on the donation amount found only a marginal main effect of the framing of the cause ($F(1, 230) = 3.00$, $p = .085$), with donation amount being marginally higher in the heartbreaking cause

condition ($M = \$9.99$, $SD = 8.20$) than in the uplifting cause condition ($M = \$8.11$, $SD = 8.40$). No other effects were found to be significant (*ns*).

Also, 2 (type of cause) × 2 (victim image blurriness) × 2 (donor ethnicity) × 2 (donor gender) ANOVA on the donation amount found a significant main effect of type of cause ($F(1, 218) = 4.20$, $p = .042$), a marginal main effect of donor ethnicity ($F(1, 218) = 3.53$, $p = .062$), a significant donor gender × donor ethnicity two-way interaction ($F(1, 218) = 5.87$, $p = .016$), a significant donor gender × cause framing two-way interaction ($F(1, 218) = 4.77$, $p = .030$), a significant donor ethnicity × framing of cause two-way interaction ($F(1, 218) = 6.15$, $p = .014$) and importantly, a significant donor ethnicity × victim image blurriness × cause framing three-way interaction ($F(1, 218) = 5.20$, $p = .024$).

We unpacked this three-way interaction by examining the donor ethnicity × victim image blurriness two-way interaction in each type of cause condition. In the heartbreaking cause condition, there was a significant donor ethnicity × victim image blurriness two-way interaction ($F(3, 218) = 4.51$, $p < .01$); White participants donated slightly more money when the victim image was blurred than when it was high-resolution ($M_{HR} = \$7.05$, $SD = 5.96$ vs. $M_{BL} = \$9.41$, $SD = 6.68$; $F(1, 218) = 1.72$, $p > .19$), whereas non-White participants donated slightly more money when the victim image was high-resolution than when it was blurred ($M_{HR} = \$14.43$, $SD = 10.43$ vs. $M_{BL} = \$11.04$, $SD = 9.08$; $F(1, 218) = 2.33$, $p > .12$). In the uplifting cause condition, on the contrary, there was no significant donor ethnicity × victim image blurriness two-way interaction ($F < 1$, $p > .51$). The pattern showed that White participants donated slightly less money when the victim image was blurred than when it was high-resolution ($M_{HR} = \$10.03$, $SD = 9.53$

vs. M_{BL} = \$6.90, SD = 7.08; $F(1, 218)$ = 1.96, $p > .16$), and the non-White participants

donated a similar amount of money regardless of whether the victim image was blurred

or high-resolution (M_{HR} = \$7.19, SD = 7.01 vs. M_{BL} = \$8.12, SD = 9.64; $F < 1$); see

Figure 14.

Figure 14. Cause framing × Ethnicity × Victim Image Blurriness Three-way Interaction
in Study 6 (Donation Amount in \$)
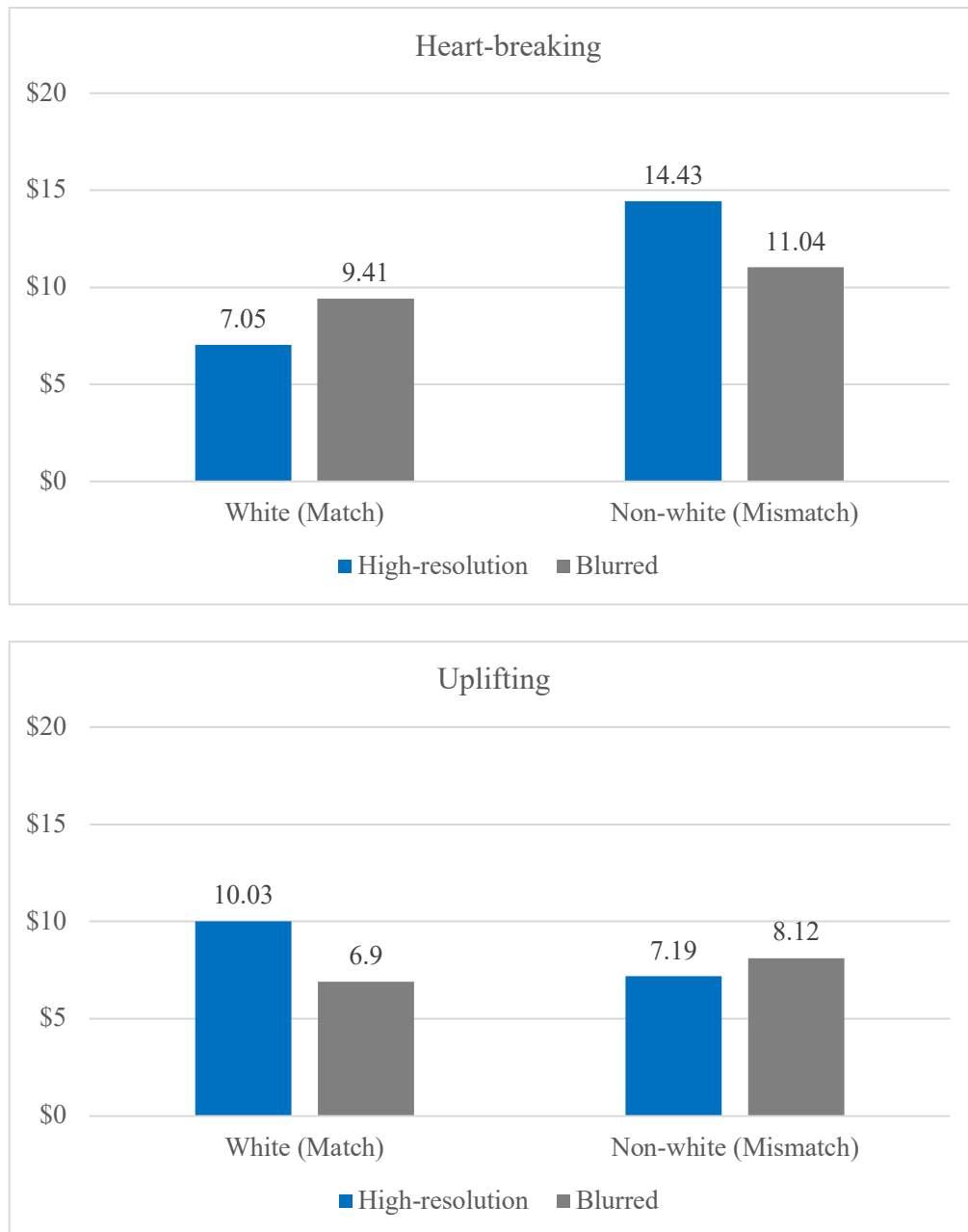
Discussion

In sum, the results from Study 6 were consistent with the prediction that we made in H3a but did not provide evidence for the support of H4, the boundary condition of cause type. Unlike in the previous studies where we identified a blurriness-is-better effect in gender dissimilarity conditions, the pattern showed that when the cause is framed as heartbreaking, perceived similarity in ethnicity (i.e., donor-victim ethnicity match) created the blurriness-is-better effect. However, the results showed only donor ethnicity × victim image blurriness × cause framing three-way interaction and a significant donor ethnicity × victim image blurriness two-way interaction in a heartbreaking cause framing condition. No other effects were found to be significant, and the simple effects were not significant.

One of the potential problems with this study is that while we framed the cause differently (heartbreaking vs. uplifting) to see whether our blurriness-is-better effect holds only for the heartbreaking condition, the charitable cause used in the study, supporting children who want to go to summer camp, was not as severe or dire compared to the charitable causes that we used in previous studies. Further implications and limitations of the current research will be discussed.

General Discussion

Overall, the current research provides counterintuitive results, showing that using high-resolution victim images may not be the best choice for making donation appeals, especially when the charitable cause is relatively serious. From Studies 1–5, we showed that blurry images yielded a higher willingness to donate (H1) and that donors' perceived

cause involvement mediated this effect (H2) when there was a perceived dissimilarity between the donor and the victim (i.e., donor–victim gender mismatch; H3b). On the contrary, Study 6 showed that when the dissimilarity was derived from an ethnicity perception, the donor–victim ethnicity match (similarity) enhanced the blurriness-is-better effect (H3a). Although we found evidence that our predicted blurriness-is-better effect was effective in donation appeals supporting a relatively serious charitable cause (i.e., child abuse, cancer, rare disease), the direct manipulation of the cause framing (heartbreaking versus uplifting) did not support the boundary condition of the cause type (H4).

Before discussing the contributions of the current research, some limitations need to be addressed. First, throughout our studies, we used images with close-up shots of victims, which made it easy for the participants to observe the victims' facial expressions. It was also relatively easy for the participants to perceive the dissimilarity between themselves and the victims. Second, we only used the charitable cause related to children. The reason is that not only is showing a child in need the most frequent strategy used by charities to encourage donation (Fisher & Ma, 2014), but we also believe that supporting vulnerable children is a highly important and urgent matter. Nonetheless, because we only used the cause relevant to children, we do not know whether the effect would hold for non-human subjects or adults. Third, although we manipulated blurriness through the Gaussian blur image processing, the standard deviation (SD) applied for each image used in our studies differed from SD1 to SD10, depending on the size of the image. This was because we used royalty-free images from the photo stock websites and thus had little control over the size of the images. Lastly and most importantly, most of the studies

(Studies 1–5) showed the effect suggested in H3b whereas Study 6 showed the pattern suggested in H3a. Overall, the pattern showed that the perceived dissimilarity derived from the gender influenced the blurriness-is-better effect, consistent with the prediction in H3b, whereas the perceived similarity derived from the ethnic background affected the blurriness-is-better effect, in line with the prediction in H3a. However, the results were not entirely clear when each of the perceived dissimilarities (i.e., gender and ethnicity) stood out. One possible solution to unravel the direction is to prime a donor's gender or ethnic identity to clearly observe how different types of perceived similarities would influence the blurriness-is-better effect.

Despite its limitations, the present research sheds light on the novel effects of using blurred images in donation appeals. Although past research found that using a vivid information could have a positive effect on persuasion through an emotional reaction (Block & Keller 1997; Sherer & Rogers 1984), we demonstrated that having a highly vivid victim image (i.e., a high-resolution image) in a donation appeal could backfire in the donation context. Furthermore, we explored possible explanations for blurriness-is-better effect by proposing two contradictory hypotheses (H3a and H3b) using two alternative accounts: emotional and dissimilarity accounts. From our series of studies, the results showed initial evidence that the type of perceived dissimilarity (i.e., gender or ethnicity) corresponded to different accounts. To test our hypotheses, we used experiments, a field study, and an eye-tracking study to validate and generalize the effect.

From a practical standpoint, the current research provides charitable organizations with guidelines for designing their donation appeals. Since the spatial resolution of an image is relatively easy to change using Gaussian Blur Image Processing, charities can

consider their charitable causes and their beneficiaries' emotional expressions in the images to design effective donation appeals. Furthermore, we show initial evidence that the potential donors' perception of dissimilarity between themselves and the victims influences the blurriness-is-better effect. Lastly, considering that high-resolution images are now prevalent across all media and product designs, future studies can further investigate the conditions when using high-resolution images are less desirable outside the donation context.

CHAPTER III

ESSAY 2 – RED VERSUS BLUE: HOW COLOR CAN MAKE CONSUMERS MORE SENSITIVE TO MASS SUFFERING

Charitable causes respond to diseases or natural disasters that often have a vast number of donation recipients. In 2005, for instance, Hurricane Katrina forced approximately 25,000 evacuees to stay in shelters in the state of Louisiana alone. Katrina caused a total of 1,833 indirect and direct fatalities in five nearby states, making it one of the costliest natural disasters in US history (CNN, 2018). While large-scale disasters and disease require substantial support, research has shown that humans' affective system has a limited capacity and that the perceived value of saving victims marginally decreases as the number of victims increases (Dickert, Sagara, & Slovic, 2011; Fetherstonhaugh et al., 1997).

Drawing upon research on color psychology, we investigate a previously underexplored area in consumer donation: how to increase donors' sensitivity to the victim number and increase donations when the case is relatively severe (i.e., has a high victim number). In particular, we examine whether the congruence of color and message framing in a donation appeal promotes sensitivity to the victim number when people are making a donation decision. Based on the existing literature on color psychology and the message framing effect in donation appeals, we predict that, when the color (red vs. blue) and message framing (promotion vs. prevention) align, individuals will show a greater willingness to donate. In this research, we define *sensitivity* as the extent to which people rely on objective information, such as the number of victims.

Although much research on donation appeals has examined the effect of central cues, such as message framing (Chang & Lee, 2009; 2010), and the role of emotions, such as guilt and empathy (Basil et al., 2006; Bozinoff & Ghingold, 1983; Hibbert et al., 2007), recent studies have shown that peripheral cues, such as color, can also be an influential factor in donation appeal (Choi et al., 2011; Mehta et al., 2011). In the present research, we explore whether the fit between message framing and color can create sensitivity and influence donors' willingness to contribute to the cause. Our research is distinguishable from that of others as we directly manipulate the color of the victim number while past research manipulated the background color of a donation appeal. Because color is relatively easy to change and because blue and red are widely used colors in donation appeals due to their salience, we expect our research to contribute to the effective design of donation appeals. Theoretically, we explore the possibility that the congruence of perceptual cue and the content to be processed can promote information processing and influence consumers' decision making.

Conceptual Background

Psychological Numbing and Mass Suffering

The affective system allows human beings to empathize. Because we have empathy and are able to feel sympathy for victims who are suffering from a cause, we tend to help others altruistically. However, numerous studies have shown that, as the number of victims in need increases, sympathy for the victims tends to decrease because our affective system has a limited capacity (Huber et al., 2011; Slovic et al., 2007). Research on *psychological numbing* shows that, when mass suffering occurs, individuals'

ability to detect individual suffering decreases as the number of victims increases, and this has been documented in the psychophysical literature (Slovic et al., 2007). As a result, people became insensitive to suffering and less likely to appreciate the loss of life as the victim number grows. Past research has also suggested an alternative explanation of the collapse of compassion, showing that individuals are insensitive to mass suffering due to a self-oriented motivation to avoid experiencing overwhelming emotion (Cameron & Payne, 2011). This research shows that, because individuals perceive massive suffering as overwhelming to them, they are motivated to strategically engage in emotional regulation. Either way, insensitivity to the number of victims is problematic because, generally, a high magnitude of suffering implies a more serious situation in which charities must seek greater monetary donations to help people in need.

Research also has examined the relevant factors that could potentially impact how individuals process numerical information representing victims. For instance, Dickert, Kleber, et al. (2011) demonstrated that individuals' ability to process numerical information (i.e., numeracy) and the format of number presentation (i.e., frequency vs. percentage) influence donation decisions. Similarly, Kleber et al. (2013) found that highly numerate individuals are more likely to donate when they perceive that a high proportion of the people in need are being helped whereas less numerate individuals are less likely to consider this proportion. Furthermore, Soyer and Hogarth (2011) showed that, in general, the amount of donation increases with an increasing of number of donation recipients but at a rate that decreased as the number of recipients increased.

Given that the manner in which we present numerical information on victims can affect donation intention, our research examines whether changing a visual element in the

numerical information regarding the victims can influence individuals' processing of victim numbers and their donation decision.

Message Framing and Regulatory Focus

When we make a decision, the self-regulatory system drives us to orient ourselves to a positive end state or compels us to avoid an undesirable end state (Crowe & Higgins, 1997). If the goal is to reach the ideal state based on hope and aspiration, the regulatory orientation is *promotion focused*. By contrast, if the goal is to avoid a negative outcome and the drivers are based on duty and obligation, the regulatory orientation is *prevention focused*. The research on regulatory foci shows how they influence individual decision making. For instance, if there is a fit between the goal (i.e., pursuing a desirable end state or avoiding an undesirable end state) and the means, individuals feel "right" about what they are doing and have amplified value experiences. In other words, if there is a fit between how they pursue their goals and what they want to achieve, it makes individuals feel good about what they are doing and impacts their attitude, judgment, and decision making (Higgins, 2005). It is also known that the regulatory focus can be primed (Kim, 2006; Kirmani & Zhu, 2007) and that it can be an innate individual trait (Carver & White, 1994; Haws et al., 2010; Lockwood et al., 2002).

In advertising, regulatory focus can be embedded in a message and framed. The effect of regulatory focus and message framing on persuasion (i.e., loss vs. gain) has been investigated especially in a public health care and communication context. For instance, Cesario et al. (2004) showed that, because individuals tend to use feeling as information, the feeling of rightness activated by the fit between an individual's regulatory state and the strategic message framing of an advertisement can significantly improve the

advertisement's persuasion. For example, an advertisement for quitting smoking can state either the benefits that smokers will experience when they quit smoking or focus on smoking's negative consequences that can be avoided if they quit smoking. The results showed that, when the regulatory goal and message framing were congruent, the outcomes were more positive (Kim, 2006).

In a consumer donation context, studies show that the fit between the state of a potential donor and the framing of a message can influence the donor's attitude toward a donation appeal and willingness to contribute. For instance, Baek and Reid (2013) showed that promotion-focused message framing corresponds with positive (vs. negative) mood priming, fosters a favorable attitude toward the appeal, and results in a greater willingness to provide support. Furthermore, research shows that the congruence between the visual element of a donation appeal (i.e., the image) and the message framing strategy can impact the effectiveness of the appeal. Recently, Zemack-Rugar and Klucarova-Travani (2018) demonstrated that the fit between the victim image and the message framing in a donation appeal can influence the donation outcome. Specifically, they report that a happy victim image (vs. a sad victim image) is more congruent with promotion-focused (vs. prevention-focused) messaging and increases donation intention through perceived response efficacy. In a similar vein, Chang and Lee (2009) showed that, when the message framing and the image used in a donation appeal are both negative, the effectiveness of the donation appeal is enhanced.

Research has been conducted on how the match between message framing and the visual element can improve the effectiveness of a donation appeal but not on how the fit between the visual element and the message framing can influence the processing of

objective information in the donation appeal. Donation appeals often contain information, such as the fatality rate, number of victims suffering from a condition, and location of the disaster or the disease. In the present research, we explore how the congruence of the visual element and the message framing can influence the processing of numerical information about victims. Specifically, drawing upon the past literature on message framing and the psychology of color, we predict that the fit between color and message framing will make potential donors react sensitively to the objective information shown in the donation appeal (i.e., the victim number). To build our hypothesis, we explore how color psychologically influences human information processing and behavior.

The Effect of Color on Consumer Donation

Until now, little research has been conducted on the effect of color as a peripheral cue and how it influences consumers' donation intention. Choi et al. (2011) explored the interactive effect of background color (warm vs. cool) and message type (heartbreaking vs. uplifting) and found that cool colors (e.g., blue) were more effective when the message was uplifting (i.e., emphasizing hope and the desire to help others) whereas warm colors (e.g., orange) were more effective when the message was heartbreaking (i.e., emphasizing the plight of victims and the obligation to help others). The rationale was that heartbreaking messages induce negative emotions, which made the study's participants perceive cooler temperatures than those who read uplifting messages. Thus, in this case, a donation appeal with a warm background color was more effective because it induced warmth. By contrast, when the participants read a donation appeal with an uplifting message and a cool background color, such as blue, they showed a greater intention to donate as the color induced a positive mood. Overall, the research

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demonstrated that, when the message presented was heartbreaking, donation appeals with warm background colors (e.g., orange) resulted in a greater willingness to donate and that participants also indicated a greater willingness to donate when the message was uplifting and the background color was cool (e.g., blue).

In a similar vein, Mehta et al. (2011) investigated the relationship between color and the type of donation request (time vs. money). Drawing on the theory of embodied cognition and semantic memory, they showed that, when the helping behavior required personal warmth or closeness (i.e., volunteering and donating time to help others), exposure to a warm background color (e.g., yellow) resulted in a greater intention to donate; however, exposure to a cool background color (e.g., light blue) resulted in a greater intention to donate when the participants were asked to provide assistance that required competency (i.e., a monetary donation). As in the explanations provided by Choi et al. (2011), Mehta et al. (2011) showed that the effect was based on individuals' perceptions of temperature induced by colors; exposure to warm (vs. cool) colors caused high (vs. low) temperature perceptions and activated physical warmth (vs. competency), which in turn led the participants to donate time (vs. money).

In summation, research has suggested that the colors used in a donation appeal influence people's perceptions and affect their giving intention. While past research on color and donation appeals have mainly studied the effects of temperature perception influenced by color and how this relates to the type of messaging (i.e., heartbreaking vs. uplifting) or type of donation (time vs. money), the present research takes a different approach and explores whether consumers' sensitivity to objective information differs based on the color used in presenting numerical information.

The primary colors blue and red are widely used because both colors are salient and they contrast with each other. In the psychology literature, numerous studies have shown that blue and red influence psychological functioning and human performance. For example, Soldat et al. (1997) found that, when participants were asked to solve a set of problems printed on either red, white, or blue paper, those assigned to the blue and white groups performed better than those assigned to the red group when their motivation was low. Mehta and Zhu (2009) also showed that red induces *avoidance motivation* whereas blue induces *approach motivation*. When participants were asked to complete one of three anagrams with different target words (target words related to approach motivation vs. avoidance motivation vs. the control group), the participants solving the avoidance motivation anagram performed better when the background was red. By contrast, participants solving the approach motivation anagram performed better when the background was blue.

Based on the findings of past research, we predict that the use of red (vs. blue) in the presentation of a victim number will generate sensitivity when the message is framed as prevention focused (vs. promotion focused). In detail, we propose the following hypothesis:

H1: The match between color and message (cause) framing will promote sensitivity to the victim number when making a donation decision. Thus, when the color (red vs. blue) and message framing (promotion vs. prevention) match, individual willingness to donate will increase as the victim number increases.

We predict that individuals will be more likely to make a contribution when the numerical information is presented in red (vs. blue) and the message is framed as prevention (vs. promotion) as this matches with individuals' semantic associations regarding those colors. Our theory is that, if the donation message is framed in a prevention focus (vs. a promotion focus), the use of red (vs. blue) in the numeric description will produce fluent processing because red (vs. blue) is associated with avoidance (vs. approach) motivation. As a result, the objective of avoiding a negative (vs. achieving a positive) outcome will be salient when red (vs. blue) is used.

To test our hypothesis, we conducted three studies, including a pilot study. In the pilot study, we manipulated only the color of the number to determine the basic effect of color on sensitivity to the victim number. In Study 1, using an existing donation appeal of a real charity (i.e., UNICEF), we found initial support for our prediction that the fit between color (red) and message framing (prevention focused) creates victim number sensitivity and, thus, promotes donation as the victim number increases. In Study 2, we directly manipulated message framing (promotion focused vs. prevention focused), victim number (low number vs. high number), and the color of the victim number (red vs. blue) to test H1.

Pilot Study

In the pilot study, we tested the base sensitivity effect of various colors without any framing. To test this, red, blue, and green were used to present the number of victims (in this study, the number of injured animals).

Methods

Participants and Design

Two hundred and forty-eight undergraduate students (41.9% female; M_{age} = 21.19, SD = 2.29) were recruited and received course credits for their participation. The study employed a 3 (number color: red vs. blue vs. green) × 2 (victim number: low vs. high) between-subjects design. In this study, we showed a donation appeal for the local raptor center and described that the center took care of injured raptors. To test the sensitivity effect of colors, we created six distinct versions of donation appeals and randomly assigned the participants to one of the conditions. Specifically, the donation appeal mentioned that "90 (vs. 9,000) raptors are killed each year," and the color of the number was manipulated (see Appendix E). To test the effect of color, the color of the number was manipulated based on strict RGB color code: red (RGB color code: 255, 0, 0), blue (RGB color code: 0, 0, 255), and green (RGB color code: 0, 128, 0).

Procedures

The participants were exposed to one of the six donation appeals on their computer screen. After seeing one of the donation appeals, the participants were asked to indicate the amount of money they would like to donate ($0–$30 slider scale). As a manipulation check, we asked the participants to evaluate their perception of the number of raptors described in the donation appeal (anchored: 1 = very small number, 7 = very large number). We also measured the salience of the number to rule out the possibility that the sensitivity effect was due to the attention-grabbing effect of the colors. At the end, we collected the demographic data of the participants.
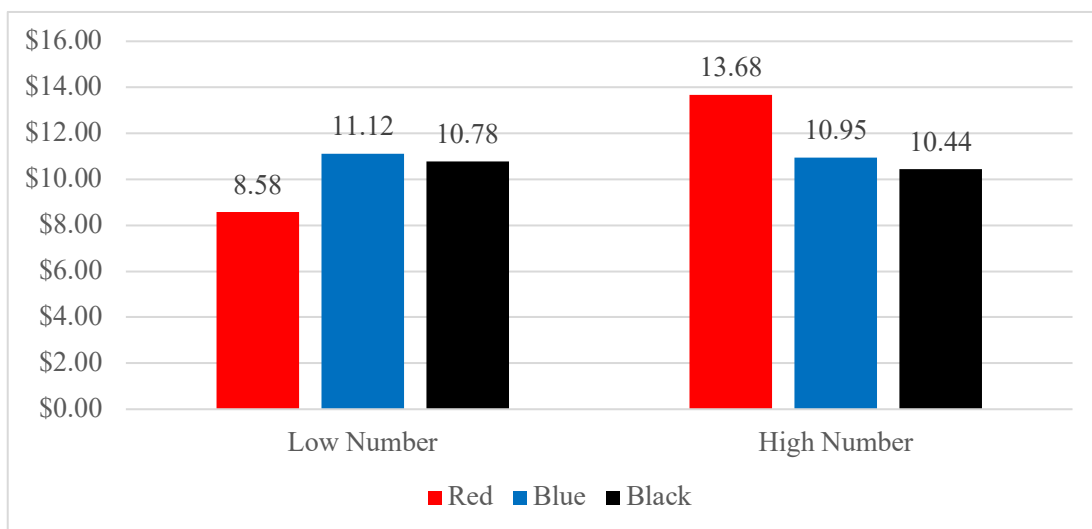
Results

Manipulation Check

A two-way ANOVA on number perception with number color and victim number as factors showed only the significant main effect of victim number. The participants indicated that the number of injured animals was higher in the high number condition (M_{high} = 5.48, SD = 1.58) than in the low number condition (M_{low} = 4.31, SD = 1.77; $F(1, 242)$ = 30.21, $p < .001$). No other effects were significant ($ps > .53$).

Donation Amount

A two-way ANOVA on donation amount with number color and number as factors showed insignificant interaction ($F(2, 242)$ = .77, $p = .464$). However, when the number of raptors was represented in red, sensitivity was shown; the participants donated marginally more money in the high number condition (M_{high} = 9.34, SD = 8.50) than in the low number condition (M_{low} = 6.21, SD = 7.24; $F(1, 242)$ = 3.88, $p = .050$).

Figure 15. Pilot Study Result (Donation Amount in $)
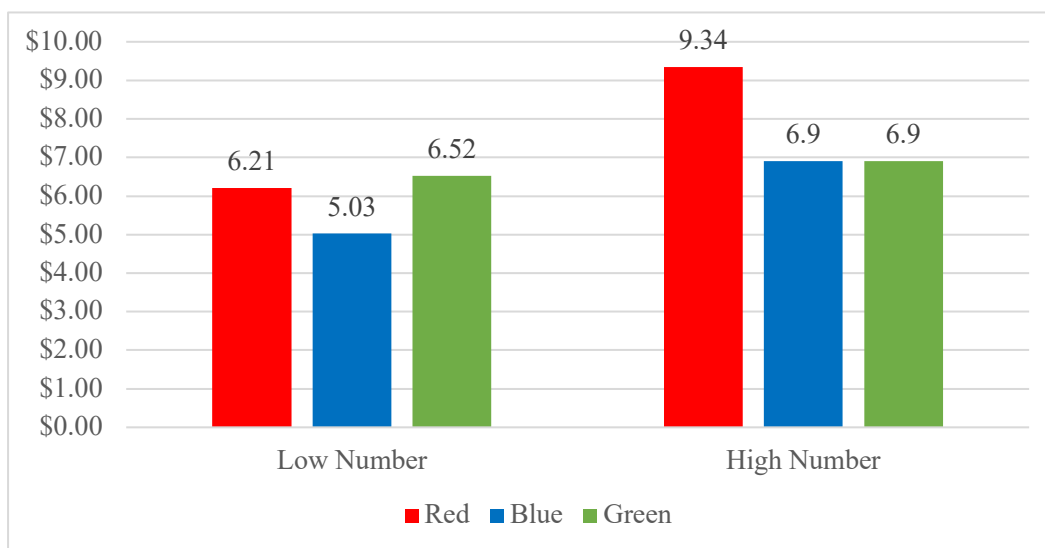
For the green and blue, there was no significant difference between the low and high number condition ($ps > .24$). Furthermore, in the high number condition, the participants who were assigned to the red condition showed a higher donation amount ($M_{red} = 9.34$, $SD = 8.50$) than those in the blue ($M_{blue} = 6.90$, $SD = 7.72$) or green ($M_{green} = 6.90$, $SD = 6.34$) condition; see Figure 15.

Attention

To test whether the sensitivity was due to the salience of the color, we measured the participants' self-reported attention paid to the victim number. The results show that there was no significant difference in attention across the color conditions. Specifically, red ($M_{red} = 5.11$, $SD = 1.41$), blue ($M_{blue} = 4.78$, $SD = 1.86$), and green ($M_{green} = 4.86$, $SD = 1.76$) did not differ significantly in terms of attention ($ps > .32$).

Discussion

From the pilot study, we found that red enhances sensitivity to number more than green or blue. In this study, however, we did not specifically use the word *prevent* in our donation appeal. Second, the framing of the message had the confounding factor that, at the end of the donation appeal, we said "Start making a difference for the animals." It is possible that this message triggered the promotion focus of the participants, resulting in a sensitivity to blue. Although the difference between the low and the high number condition was not significant, the trend was upward. In the following studies, we tested our hypothesis using prevention message framing.

Study 1

In Study 1, we tested whether the congruence of a prevention-focused donation message and the color red creates sensitivity to the victim number when individuals make a donation decision. To test this, we created various versions of donation appeals, manipulating the number of victims (low vs. high) and the color of the victim number (red vs. blue vs. black) using a real-world donation appeal.

Methods

Participants and Design

Two hundred and forty-eight undergraduate students (45.5% female; M_{age} = 21.21, SD = 3.77) were recruited from the subject pool, and the participants received course credits for their participation. The study employed a 3 (number color: red vs. blue vs. black) × 2 (victim number: low vs. high) between-subjects design.

To test whether the congruence of the number color and the message framing (i.e., prevention-focused message framing) creates sensitivity, we created six distinct versions of donation appeals using an UNICEF donation appeal and randomly assigned the participants to one of the conditions. Specifically, the donation appeal mentioned that "100 (vs. 10,000) children die every day from causes we can *prevent*," and the number of victims was manipulated. To determine how color influences the processing of victim number, we also manipulated the color of the victim number (see Appendix F for details).

In the original UNICEF donation appeal, the official cyan color representing UNICEF (RGB color code: 0, 153, 255) was used for the victim number. However, to determine whether the congruence of color (i.e., red) and message framing (i.e.,

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prevention focused) creates a fluent processing of the victim number, we manipulated the number color as strict red (RGB color code: 255, 0, 0) and blue (RGB color code: 0, 0, 255). In addition, we added black (RGB color code: 0, 0, 0) as a control color.

Procedures

The participants were exposed to one of the six donation appeals on their computer screen. After seeing one of the donation appeals, the participants were asked to indicate the amount of money they would like to donate to help the children who appeared in the donation appeal ($0–$30 slider scale). As a manipulation check, we asked the participants to evaluate the number of victims that they had seen in the donation appeal (anchored: 1 = very small number, 7 = very large number). In addition, to rule out an alternative hypothesis of attention, we asked the participants to self-report their attention paid to the victim number when reading the donation appeal (anchored: 1 = not at all, 7 = very much). At the end, we collected the participants' demographic data.

Result

Manipulation Check

A two-way ANOVA on number perception with number color and victim number as factors showed only the significant main effect of victim number. The participants indicated that the victim number was higher in the high victim number condition (M_{high} = 5.08, SD = 1.49) than in the low victim number condition (M_{low} = 4.28, SD = 1.83; $F(1, 242)$ = 14.05, $p < .001$). No other effects were significant ($ps > .13$).

Donation Amount

A two-way ANOVA on donation amount with number color and victim number as factors revealed a marginally significant interaction ($F(2, 242) = 2.72$, $p = .068$). As predicted, the sensitivity to the victim number increased only when the victim number was represented in red; the participants donated significantly more money in the high victim number condition ($M_{high} = 13.68$, $SD = 7.99$) than in the low victim number condition ($M_{low} = 8.58$, $SD = 7.49$; $F(1, 242) = 7.41$, $p = .007$). For the black color and blue color, there was no significant difference between the low and high victim number conditions ($ps > .86$).

Furthermore, in the high victim number condition, the participants who were assigned to the red condition gave a higher donation amount ($M_{red} = 13.68$, $SD = 7.99$) than those in the blue ($M_{blue} = 10.95$, $SD = 9.36$) or black ($M_{black} = 10.44$, $SD = 8.42$) color condition, and the difference was marginal for the red versus the black condition ($p = .082$). No other effects were found (*ns*); see Figure 16.

Figure 16. Number color × victim number two-way interaction in Study 1 (Donation Amount in $)

To rule out the alternative hypothesis that the sensitivity effect in red results from the color red's being more salient than the other colors, we measured the participants' self-reported attention paid to the victim number. The result showed that there was no significant difference in attention across the color conditions. Specifically, red (M_{red} = 4.76, SD = 1.52) and blue (M_{blue} = 4.84, SD = 1.79) did not differ significantly in terms of attention.

Discussion

The results of Study 1 support our prediction that, for the prevention-focused message framing, the number presented in red enhances donors' sensitivity to the number of victims and influences their donation amount. In Study 2, we replicate this finding using a new donation appeal and manipulate two distinct types of framing: prevention focused and promotion focused.

Study 2

In Study 2, we directly tested our hypothesis by manipulating the framing of the message in the donation appeal (prevention focused vs. promotion focused). In this study, we expect that when the victim number is presented in red, the prevention-focused message framing will induce a sensitivity effect whereas, when the victim number is presented in blue, promotion-focused message framing will show a sensitivity effect.

Method

Participants and Design

One thousand three hundred and four Amazon Mechanical Turk workers participated in Study 2 in exchange for a modest payment. We removed 47 participants with duplicate IP addresses, 41 participants who were color blind, and 69 participants who failed the attention check. The final sample included 1,137 participants (ages 18–78, $M_{age} = 36.38$; 39.3% female). The participants were randomly assigned to one of the eight conditions in a 2 (message framing: prevention focused vs. promotion focused) × 2 (number color: red vs. blue) × 2 (victim number: low vs. high) between-subjects design.

Procedures

To replicate the congruence effect of number color and message framing, we created new fictitious donation appeals. Specifically, in the promotion-focused message framing condition, we inserted copy saying "100 (vs. 10,000) children die every day from various causes. *The lives of these children can be saved*" whereas, in the prevention-focused message framing condition, the copy read "100 (vs. 10,000) children die every day from various causes. *The deaths of these children can be prevented*." As in Study 1, the color of the victim number (red vs. blue) and the number of the victims (100 vs. 10,000) were also manipulated (see Appendix G for details).

As in Study 1, after exposure to the one of the donation appeals, the participants were asked to indicate their donation amount to the charity ($0–$30 slider scale). Afterward, the participants answered the victim number manipulation check questions ("*How dire is the situation described in the donation appeal?*" and "*How serious is the situation described in the donation appeal?*") (anchored: 1= not at all dire/serious, 7 = very dire/serious) and provided their demographic data.

Results

Manipulation Check

A 2 (message framing: preventing deaths vs. saving lives) × 2 (number color: red vs. blue) × 2 (victim number: low vs. high) ANOVA on the rating of the seriousness of the cause found a significant main effect only of victim number ($F(1, 1129) = 10.02$, $p < .002$; other effects, $Fs < 2.17$, $ps > .14$). A similar 2 × 2 × 2 ANOVA on how dire the situation was also found a significant main effect only of victim number ($F(1, 1129) = 10.00$, $p < .002$; other effects, $Fs < 2.20$, $ps > .13$).

Donation Amount

A 2 (message framing: prevention focused vs. promotion focused) × 2 (number color: red vs. blue) × 2 (victim number: low vs. high) ANOVA on the donation amount found a significant main effect of number color ($F(1, 1129) = 5.61$, $p = .018$) and a significant three-way interaction ($F(1, 1129) = 4.31$, $p = .038$). No other effects were significant ($Fs < 1.92$, $ps > .16$).

We probed the three-way interaction by examining the number color × victim number two-way interaction in each of the message framing conditions. In the prevention-focused message framing condition (i.e., preventing deaths), there was a significant number color × victim number two-way interaction ($F(3, 1129) = 3.89$, $p < .01$). When the victim number color was blue, the participants donated marginally less money when the victim number was high than when it was low ($M_{low} = 13.74$, $SD = 10.38$ vs. $M_{high} = 11.67$, $SD = 9.84$; $F(1, 1129) = 2.85$, $p = .092$). When the victim number color was red, however, the participants donated marginally more money when the victim

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number was high than when it was low (M_{low} = 9.59, SD = 9.20 vs. M_{high} = 11.72, SD = 10.33; $F(1, 1129)$ = 3.16, p = .076).

In the promotion-focused message framing condition (i.e., saving lives), there was no significant number color × victim number two-way interaction ($F < 1$, $p > .75$). Victim number did not significantly influence the participants' donation amount regardless of whether the victim number color was blue (M_{low} = 12.11, SD = 10.52 vs. M_{high} = 12.54, SD = 10.77; $F < 1$, $p > .72$) or red (M_{low} = 11.69, SD = 10.09 vs. M_{high} = 11.31, SD = 10.05; $F < 1$, $p > .75$); see Figure 17.

Figure 17. The 2 (message framing) × 2 (number color) × 2 (victim number) Three-way Interaction in Study 2 (Donation Amount in $)
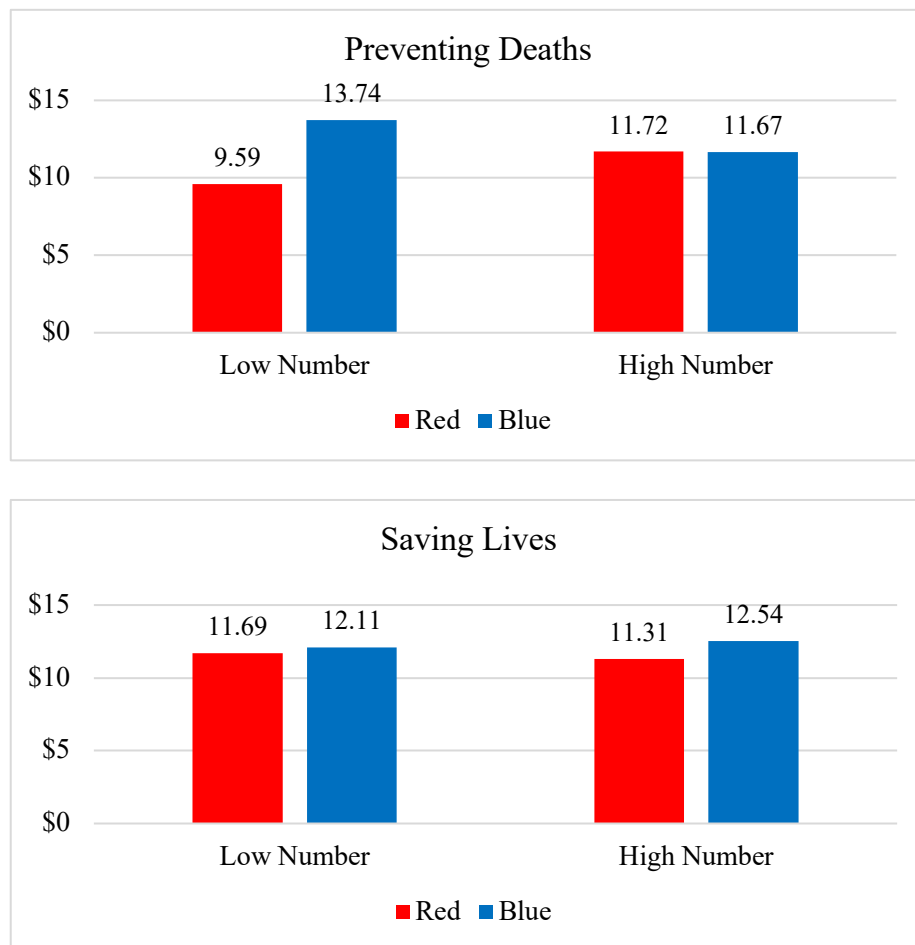
Looked at differently, when the victim number was low, there was a significant cause framing × number color two-way interaction ($F(3, 1129) = 3.98$, $p < .01$). In the prevention-focused message framing condition, when the victim number was low, the participants donated more money when the number color was blue than when it was red ($F(1, 1129) = 11.65$, $p < .001$) whereas, in the promotion-focused message framing condition, number color did not significantly influence the donation amount ($F < 1$, $p > .73$). When the victim number was high, there was no significant cause framing × number color two-way interaction ($F < 1$, $p > .77$). In this case, number color did not significantly influence the donation amount regardless of whether the cause was framed as prevention focused ($F < 1$, $p > .96$) or promotion focused ($F < 1.07$, $p > .30$).

Discussion

The results of Study 2 show that, when the message is framed as prevention focused, a number color × victim number two-way interaction exists. Although the difference was marginal, the direction indicated that the red number color increased the donation amount as the victim number increased whereas, when the number was presented in blue, the pattern was reversed so that participants intended to donate more when the victim number was low rather than when it was high. By contrast, when the message was framed as promotion focused, the two-way interaction did not appear, and the sensitivity effect in blue was not observed.

General Discussion

Overall, the results of the three studies show that message framing and the colors used in presenting the victim number jointly influence individuals' donation decisions. Specifically, we demonstrated that the congruence of the message framing and the color used in presenting the numerical information can positively influence donation outcome. When the donation appeal used prevention-focused message framing, the use of red in the victim number increased the donors' sensitivity to the victim number and, as a result, increased the donation amount parallel to the victim number. When the donation appeal used a promotion-focused message, however, the congruence effect of number color (i.e., blue) and message framing did not exist. Thus, our hypothesis is partially supported.

We expect the present research to extend the existing research on color and donation appeal by showing another way of using color in donation appeals. While the previous literature has focused on how various background colors in the donation appeal influence consumers' donation intention (Choi et al., 2011), we demonstrate that the use of the colors red and blue in text can influence consumers' willingness to donate. Although past research has shown that the perceived value of saving victims diminishes marginally as the total number of victims increases (Dickert, Sagara, & Slovic, 2011), our research suggests that, if the right color with the right message framing is used, consumers can be made sensitive to the objective seriousness of the cause (i.e., the victim number) and increase their donation intention. On the practitioner side, we show that charities should use color strategically in their donation appeal depending on how they frame their donation message.

The present research has several limitations. First, we focused only on the effect of red versus blue, which is widely known and documented in color psychology. Future studies can explore whether colors other than blue and red induce the sensitivity effect. Second, in the pilot study, the message framing manipulation was not entirely clear. The message could have been perceived as either prevention focused or promotion focused. Also, the victims were animals (i.e., raptors), not humans, and this may have influenced the results. Finally, although we predicted the sensitivity effect of blue in promotion-focused message framing, Study 2 did not show significant results. Future studies should explore why the fit between red and prevention-focused message framing is stronger than the fit between blue and a promotion focus. Lastly, to validate the number color/message framing congruence effect on sensitivity and donation intention, a field study should be conducted to determine whether the pattern also holds for consumers' real-world donation behaviors.

APPENDICES

Appendix A

Stimuli (Essay 1: STUDY 1-3)

- High-resolution image

Each day in the US, it is estimated that more than 5 children die as a result of child abuse, and child abuse is reported on average every 10 seconds – that's over 3 million reports per year.

Help us put an end to child abuse. Your gift will ensure that SPCC's services will continue to reach those in need.

Society for the Prevention of Cruelty to Children (SPCC)
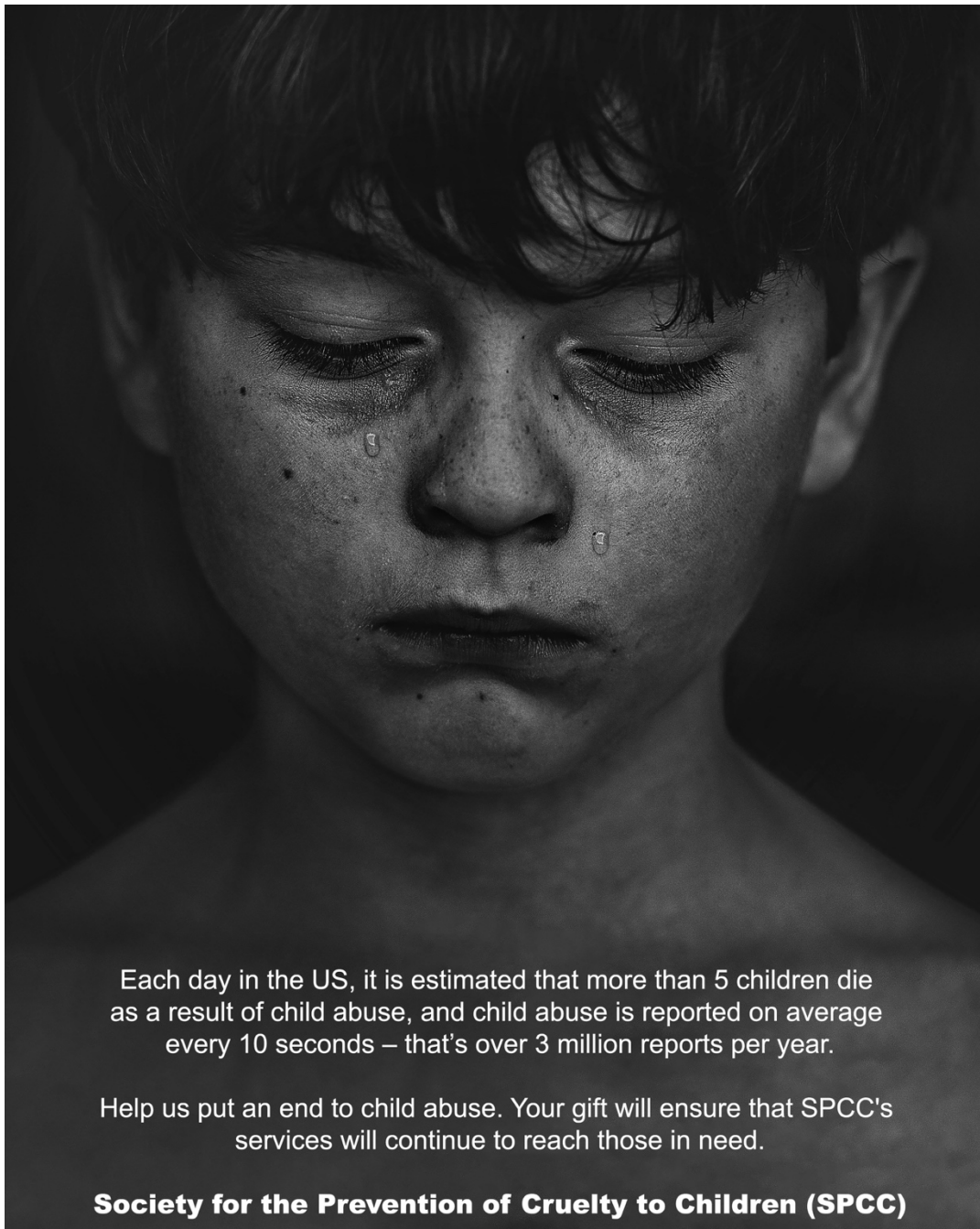
- Blurred image

Each day in the US, it is estimated that more than 5 children die as a result of child abuse, and child abuse is reported on average every 10 seconds – that's over 3 million reports per year.

Help us put an end to child abuse. Your gift will ensure that SPCC's services will continue to reach those in need.

Society for the Prevention of Cruelty to Children (SPCC)

Stimuli (Essay 1: Study 4)

- High-resolution image (African victim condition)

Each year in Africa, there are an estimated 15,780 children
who are diagnosed with pediatric cancer. Survival however is with a cost.

The Child Cancer Fund (CCF) relies on the generosity of people like you
to provide funds that will offer the support, information, and services
to families going through one of the toughest fights of their life.

With your donation, we can reach more children and families
to ensure they are not alone.

- Blurred image (African victim condition)

Each year in Africa, there are an estimated 15,780 children
who are diagnosed with pediatric cancer. Survival however is with a cost.

The Child Cancer Fund (CCF) relies on the generosity of people like you
to provide funds that will offer the support, information, and services
to families going through one of the toughest fights of their life.

With your donation, we can reach more children and families
to ensure they are not alone.

Appendix C

Stimuli (Essay 1: Study 5)

High-resolution   Blurred

AOI (high-resolution image vs. blurred image)

Appendix D

Stimuli (Essay 1: Study 6) examples

- Heartbreaking, high-resolution condition

To some children, camp offers a reprieve for them to escape personal burdens
such as parental divorce, violence or neglect.
Children from low-income and foster families also needs
a safe place to play and tools for a lifetime of growth.

The Child Welfare League of America (CWLA) provides camp opportunities
for families who may not be able to fund a camp experience for their child.

Help CWLA to provide camp scholarships for children in the US.

CWLA

- Uplifting, blurred condition

To the children, the benefits of the camp experience are priceless.
They develop a sense of independence as they try new adventures away from home.
They also gain self-confidence as they learn new skills.

The Child Welfare League of America (CWLA) believes strongly
in the value of the camp experience and wants to ensure that
every child has the opportunity to attend camp.

Help CWLA to provide camp scholarships for children in the US.

CWLA

Stimuli (Essay 2: Pilot Study)

In the Eugene area, about **90** raptors are killed each year because of humans.

Raptors are killed or injured in collisions with vehicles, poisoned by rodenticides, tangled in fishing line or barbed wire, or shot by hunters.

Your generosity and support will help the Cascades Raptor Center continue critical medical care to raptors.

Start making a difference for the animals.

In the Eugene area, about **9000** raptors are killed each year because of humans.

Raptors are killed or injured in collisions with vehicles, poisoned by rodenticides, tangled in fishing line or barbed wire, or shot by hunters.

Your generosity and support will help the Cascades Raptor Center continue critical medical care to raptors.

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Raptors are killed or injured in collisions with vehicles, poisoned by rodenticides, tangled in fishing line or barbed wire, or shot by hunters.

Your generosity and support will help the Cascades Raptor Center continue critical medical care to raptors.

Start making a difference for the animals.

Appendix F

Stimuli (Essay 2: Study 1)

Stimuli (Essay 2: Study 2) examples

- Prevention message framing, red number color, high victim number condition

- Promotion message framing, blue number color, low victim number condition

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