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The Impact of Temperature Sensations on Donation Intentions: Exploring the Role of Need for Affiliation and Empathy

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Abstract: *The research presented in this paper delves into the fascinating realm of how temperature, both physical and psychological, can influence human behavior, specifically in the context of charitable donations. It offers valuable insights into the intricate relationship between our sensory experiences and our motivations to engage in prosocial acts. Throughout the four comprehensive studies conducted, the authors shed light on the intricate dance between temperature and our innate need for social warmth and connection. They explore how feeling physically cold or being primed with cold imagery can trigger a desire for social affiliation and empathy, ultimately leading individuals to engage in charitable acts, such as donations. The studies provide robust evidence that when individuals experience the discomfort of cold, whether through physical touch or psychological priming, they are more inclined to seek remedies to rectify their feelings of loneliness and social isolation. This leads to a heightened desire for social connectedness, which, in turn, fosters increased levels of empathy and a greater likelihood of making charitable donations. In essence, the act of donation becomes a compensatory mechanism to counterbalance the perceived social deficit caused by feeling cold. Moreover, the research extends beyond the laboratory setting by conducting a field study in a coffee shop, demonstrating the generalizability of the findings. It reveals that the link between temperature, empathy, and charitable acts holds true in real-world scenarios. These findings offer valuable implications for social marketing and public service announcement campaigns, suggesting that the timing and context of these messages should be carefully considered. In conclusion, this research provides a deeper understanding of the complex interplay between temperature, social warmth, and charitable behavior. It highlights the significance of considering individuals' psychological states when designing campaigns or interventions aimed at promoting prosocial actions. Ultimately, it emphasizes the power of empathy and social connectedness in driving positive social change.*
Keywords: Public Service Announcement, donation, need for affiliation, empathy, cold sensations.
JEL Classification: M37, M38.

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The Impact of Temperature Sensations on Donation Intentions: Exploring the Role of Need for Affiliation and Empathy

Introduction

Studies have shown that feeling cold or warm triggers compensatory or assimilative behaviours. For instance, people feeling cold prefer romantic movies (compensatory consumption; Hong & Sun, 2011), or people in visually warm stores are likely to feel physically warm and experience more intimacy (Baek et al., 2018). With regards to donation, Choi et al. (2016) find that warm (cold) temperatures lead to more (less) donation, exhibiting an assimilative effect. We depart from their research findings and demonstrate that motivation to change one's state leads to compensatory behaviours. Only when a person is feeling cold rather than *thinking* about it (Choi et al., 2016) are they likely to engage in behaviours to change this state of discomfort (Zhang & Risen, 2014). This motivation leads participants to engage in compensatory consumption or show higher donation intentions than participants in the assimilative situation.

Governments employ PSA to warn the public of various health hazards like the dangers of smoking or drug abuse. Fear appeal, e.g., smoking increases lung cancer, is used in such messages because of its suggested effectiveness on attitudinal and behavioural change (Keller & Lehmann, 2008). However, the downside of such a campaign is that it creates message avoidance in the viewers (Murdock & Rajagopal, 2017). Consequently, several studies have focused on tweaking how the message is presented to enhance viewer receptivity. Here, we focus on the message context rather than message delivery. We consider temperature as one source of information. Throwing light on the underlying psychological mechanisms that drive donating behaviours, we propose that feeling cold by priming cold images activates the need for social warmth and the desire for affiliation (Lee et al., 2014; Hong and Sun, 2011). People feeling cold are more likely to seek remedies to repair that state (Lee et al., 2014). Prosocial acts such as helping others and donating to a human cause are considered practical tools to affiliate and overcome the state of imbalance in one's social relations (Lee and Shrum, 2012; Rai et al., 2017). These prior studies have focused on using online surveys using Mturk or undergraduate student participants (Rai et al., 2017).

In this paper, we conducted three lab experiments to establish the relationship between temperature and consumer spending and one field study conducted in a coffee shop to extend the generalizability of such a relationship. We also differentiate how donation behaviours are different from making purchases by focusing on the role of temperature on donation and non-charitable (shopping behaviours). From a theory perspective, this research contributes to the ongoing debate on temperature's compensatory vs. assimilative impact. The results show that when there is a motivation to change one's state, i.e., feeling cold and lacking social warmth, users are likely to partake in activities, such as donating and sharing the message, which can compensate for the lack of the desired warmth. However, when people are in a comfortable state, i.e., feeling warm, they are less likely to engage in behaviours that might change their current agreeable state, exhibiting assimilative behaviours that maintain their current state. Further, we also demonstrate that the compensatory effect of donation alleviates the feeling of loneliness and makes people feel reconnected and feel good about their actions, but only through donations and not purchases. This finding highlights the significance of social warmth in donations.

Literature Development

Psychological Effects of Temperature. Research on the effects of temperature in marketing and psychology has found two competing effects of temperature- assimilative or compensatory. Warm temperature is suggested to increase perceptions of social closeness, reflecting an assimilative effect (Huang et al., 2014). Warm temperature induces comfort, like a warm touch from another person (Williams and Bargh, 2008). Mostly, objects (e.g., touching something warm) and events (e.g., hugging someone) that produce the same quality of affective response are suggested to be associated with our memories. Physical warmth detected through touch is also connected to personality traits associated with being friendly, helpful, and trustworthy (Fiske et al., 2007).

The relationship between social and physical warmth/cold is bi-directional. Social exclusion is related to physical coldness, i.e., lonely people are likelier to feel cold (Zhong & Leonardelli, 2008). People feeling cold have a reduced tendency to be moved or feel compassion (Choi et al., 2016). However, another series of studies related to temperature suggests compensatory effects. For instance, those who experienced social

isolation compensated for the need for social warmth by taking warm baths or showers, i.e., physical warmth (Bargh & Shalev, 2012). When there is a psychological or physical imbalance, individuals unconsciously act to regain balance (Lee et al., 2014). Consumption experiences (i.e., watching a romantic movie) might help regulate the imbalance (i.e., the current state of loneliness).

The effects of primed warmth/coldness in participants on the following task must be considered to discern such varying responses. Bodily temperature priming (e.g., holding/touching something cold or cold ambient temperatures) leads to compensatory behaviour. In contrast, mere priming of a concept of coldness (e.g., viewing images of snow or writing about a cold day) leads to an assimilative effect. This is because the concept of coldness does not necessarily lead to feeling cold, thus, not prompting a need to change the present state (Zhang & Risen, 2014). However, when people are reminded that they are cold (sense the discomfort of cold), they will likely correct their incidental feelings and engage in compensatory behaviour (Hong & Sun, 2011). Zhang and Risen (2014) strongly argue and demonstrate that motivation is critical for compensatory embodiment effects. In addition to priming, the task following the priming also influences responses. "Feelings-as-information" is query-dependent, i.e., different tasks can elicit different consumer responses based on the task that follows the feelings prime (Pham, 2007).

Need for Affiliation and Empathy. Participants feeling (not just thinking) cold are also likely to feel more socially disconnected. To regulate negative emotions, people might engage in compensatory behaviours (Andrade & Cohen, 2007). Mead et al. (2010) suggests that consumers feeling excluded are likely to even sacrifice their well-being and partake in actions, sometimes illegal ones, to feel included. In other words, loneliness increases the need for affiliation (NFA) (Park & Maner, 2009), and that will motivate people to engage in coping strategies to reduce their loneliness (Cacioppo et al., 2015). Consequently, we propose that consumers feeling cold are likely to feel a heightened desire for social connectedness or NFA and are likely to take action to change their state. The need to affiliate is likely to lead people to seek opportunities to build relationships with others until the need is fulfilled (Leary & Baumeister, 2017). Of more relevance to this study is the finding that when consumers' need to belong is threatened, they show an increased preference for appeals that provide an opportunity to connect socially (Lu & Sinha, 2017). For instance, socially excluded participants in Lu and Sinha's (2017) study showed an increased preference for emotional (vs. rational) cues in blood donation and recycling ads.

Affective paths, such as empathy, are suggested to be effective even when the possibility of social connection is not immediate. Empathy, an effective response, includes compassion and concern when individuals witness someone in need (Niezink et al., 2012). More generally, empathy influences a person's interaction with and behaviour towards others (Kemp et al., 2017). Hence, empathy is critical for maintaining one's well-being and social relationships. People feeling lonely are likely to remember their social ties and pay more attention to emotional cues to reduce their loneliness and compensate for their lack of social connectedness (Huang et al., 2014). Moreover, empathy mediates the relationship between loneliness and helping behaviour (Twenge et al., 2007). Based on this line of thinking, we argue that participants feeling cold and consequently feeling a higher NFA are more motivated to show higher empathy after exposure to a PSA.

Charitable Intentions. Lonely people (i.e., feeling socially cold) fixate more on social stimuli compared to individuals who are not lonely (i.e., feeling socially warm) (Cacioppo et al., 2015). As a result, people feeling physically cold and socially cold or isolated (i.e., lonely) are more aware of any information offering social cues, such as a PSA donation message. Increased levels of empathy tend to lead to higher donations (Bagozzi & Moore, 1994). Empathy resulting from loneliness is also supposed to increase helping behaviour in people (Twenge et al., 2007). Socially isolated people are ready to spend money to establish an affiliation with others (Lee et al., 2017). Relational needs increase charitable and helping behaviour because such acts increase interpersonal attractiveness (Lee & Shrum, 2012). Spending money via donations acts as a signal to demonstrate that a person has desirable traits (Rucker et al., 2014).

> ***H1:*** *Participants feeling cold (vs. feeling warm) are (a) more likely to have higher NFA, which in turn is likely to (b) increase empathy and (c) increase donation intentions.*

Donation has been suggested to make one happy (Kim, 2017). Based on this, we would expect participants feeling cold to be in a state similar to the warm participants after engaging in donation behaviour. If a donation is a compensatory act, cold participants should have 'compensated' for their deficient state and feel similar to the warm participants. Therefore, the authors hypothesize that:

H2: *Donating is likely to compensate participants primed with cold images by increasing (a) temperature perceptions, (b) positive emotions, and (c) feelings of connectedness to restore their state of social warmth.*

In study 1, a lab experiment, authors examine how temperature (feeling cold-warm) drives donation and further identify the underlying emotional processes (NFA and empathy). The authors then replicate the above compensatory effects in a field setting conducted in a coffee shop (Study 2). Here, instead of being primed through images, participants are physically holding a warm/cold beverage and experiencing cold/warmth. In online study 3, the authors show that participants in the primed cold condition can attain an emotional state similar to participants in the warm condition by donating. Finally, they establish that donation exhibits a compensatory act and is a unique spending behaviour by comparing social warmth levels after donation behaviour with a purchase task (Study 4).

Methodology and Research Methods

Study 1: Relationship between Temperature, NFA, Empathy and Donation Intentions

Participants and Methods. One hundred and eighty-six participants from a Midwestern university were randomly assigned to one of the three conditions (temperature: warm/cold/neutral). Participants were informed that they would be sequentially participating in three separate studies. They were told that the purpose of the first study (temperature images) was to rate some stock images which could be used as screensavers. To measure NFA, they were told in the second study that they would have to evaluate some scales, which are being tested and will be used for future research. Participants were asked to evaluate a PSA message on anti-smoking for the final study. The design is adapted from Lee and Shrum (2012).

Pretested images of steaming hot or ice beverages, e.g., coffee tea, were used to prime warm or cold states, respectively. A neutral condition was included to set the baseline; images included three wooden furniture pictures. Vivid imagery helps in evoking sensory-related memories effectively (Martin et al., 2011). In addition to showing participants warm/cold images, we ask them about the temperature that they are currently feeling ("How do you feel?" measured from 1 = extremely cold to 7 = hot). Overall, viewers feeling cold are more likely to donate, which is why temperature perceptions become critical. The PSA chosen for this study included two anti-smoking images. The items for the NFA were from Park and Maner (2009) (α = .81). After responding to questions on the NFA, participants viewed the anti-smoking pictures and responded to queries on empathy (α = .88) and donation intentions (Batson et al., 1983; Choi et al., 2016).

Results

Manipulation Check. The manipulation check confirmed the effectiveness of the temperature priming. Participants felt warmer after seeing the warm vs. cold images (M_{warm} = 5.18 vs M_{cold} = 3.33; t (138) = 10.07, p< .01) and warm vs. neutral images (M_{warm} = 5.18 vs M_{neutral} = 3.90; t (147) = 7.94, p< .01). Similarly, participants reported feeling colder after seeing the cold vs. neutral images (M_{cold} = 3.33 vs M_{neutral} = 3.90; t (123) = -3.30, p< .01).

Donation Intentions. Regression analysis was conducted using the Model 6 serial mediation of PROCESS (Hayes, 2013) with a bootstrap sample of 5,000 participants. The perceived temperature was included as the independent variable, the NFA and empathy as the mediators, and donation intention was the dependent variable. The control variables included NFT (autotelic), gender, smoking habits, and awareness of PSA messages. As expected, we find that temperature perceptions influence NFA (β = -.12, p< .05), NFA, in turn, influences empathy (β = .35, p< .01) and finally, empathy influences donation intentions (β = 10.20, p< .01). The serial mediation had a significant effect (-.42; CI (-1.32, -.03)), while the direct effect of perceived temperature on donation was not significant. None of the covariates significantly affected the dependent variables (see Table 1). The results suggest that participants who felt colder were likely to report a higher NFA, while participants who felt warmer felt less NFA, supporting hypothesis 1a.

Further, participants who perceived colder temperatures were significantly more likely to show higher empathy because of a higher NFA, thus supporting hypothesis 1b. Moreover, higher empathy resulted in a higher donation to the cause, supporting hypothesis 1c. In the following study, we replicate the above results through embodied rather than image priming in a field study.

Table 1. Regressions Results with and without Covariates (Study 1)

	Outcome: Need for Affiliation			
	Coefficient (*β*)	***p*-value**	**Coefficient (*β*)**	***p*-value**
Constant	**2.86**	**.001**	3.59	**.001**
Perceived temperature	-.12	.03	-.09	.09
NFT (autotelic)	.01	.87		
Gender	.13	.28		
Smoking habits	.01	.71		
Awareness	.08	.47		
R-sq	.04		.02	
Outcome: Empathy				
	Coefficient (*β*)	***p*-value**	**Coefficient (*β*)**	***p*-value**
Constant	1.17	.19	**3.26**	**.001**
NFA	**.35**	**.03**	**.35**	**.001**
Perceived temperature	.04	.46	.03	.63
NFT	.05	.59		
Gender	.03	.79		
Smoking habits	-.05	.18		
Awareness	.01	.95		
R-sq	.10		.09	
Outcome: Donation Intentions				
	Coefficient (*β*)	***p*-value**	**Coefficient (*β*)**	***p*-value**
Constant	6.40	.87	28.02	.07
NFA	-2.81	.44	-3.11	.36
Empathy	**10.20**	**.001**	**11.18**	**.001**
Perceived temperature	3.29	.20	2.39	.32
NFT	-3.26	.37		
Gender	-.49	.93		
Smoking habits	2.60	.12		
Awareness	2.37	.63		
R-sq	.08		.07	

Source: Compiled by the authors for Study 1

Study 2: Relationship between Temperature, Donation Intention and Message Sharing in a Field Study

Participants and Methods. The field study took place inside a coffee shop (large chain coffee shop) near a US university on the West Coast. Two research assistants, trained by one of the authors and blind to the study's hypotheses, randomly intercepted consumers who had just purchased a beverage at the pick-up line. The participants were asked if they were willing to participate in a short study in exchange for entering a lottery for a $20 gift card. The participants were told that this study was being conducted to make PSA messages more effective. A total of 73 participants took part in this study. Forty-nine participants were 18-24, 43 (58%) were women, and 40 (54%) were White. In the survey, participants responded to questions on how hot or cold the beverage felt ("How hot or cold is your drink?"). Other coffee purchase-related questions were asked, i.e., preference for hot/cold beverages, the frequency of visiting the coffee shop, etc. The questions were asked while the participant was holding the drink (it took a minimum of five minutes to finish the study). They viewed the anti-smoking ad used in the previous study and responded to questions on ad sharing and donation intentions. We had to remove one response since the participant left midway through the study.

Results

Manipulation and Confounds Check. The manipulation check showed that the temperature priming was effective. Participants holding the cold vs. warm beverage reported feeling colder vs. warmer (M_{cold} = 1.73 (1.24) vs M_{warm} = 6.19 (.93); t (71) = 16.88, $p < .01$). There were no significant differences in researchers' recordings of outside temperature (M_{cold} = 59.61 (3.87) vs M_{warm} = 58.41 (2.65); t (71) = 1.50, $p > .10$) and room temperature (M_{cold} = 70.90 vs M_{warm} = 70.81; t (71) = .20, $p > .10$) for both warm and cold beverage conditions. There were also no significant differences in participants' perceptions of room temperature (M_{cold} = 4.05 (.74) vs M_{warm} = 3.91 (.82); t (71) = .78, $p > .10$) for the cold and warm conditions. These measures rule out the possibility that temperature effects on the dependent variables is because of recorded/perceived ambient or outside temperature.

Donation Intentions and Message Sharing. In this study, we conduct embodied priming, e.g., holding a warm or cold beverage. Hence the warm/cold condition is considered as the independent variable. Because people are likely to physically feel warm/cold, unlike in the prior study where participants were semantically primed. Hence the other motivational goal is not as critical. As expected, we find that participants who felt colder were more likely to donate (F (2, 65) = 3.47, p < .05), (M_{warm} = 3.08 (.25) vs M_{cold} = 2.35 (.22); p < .05; reverse-scored), finding support for hypothesis 1c (replicating study 1 findings), and more likely to share the ad (M_{warm} = 4.10 (.24) vs M_{cold} = 3.43 (.21); p < .05; reverse-scored), supporting hypothesis 1d. Only age had a significant effect on donation intentions (p < .01). See results detailed in Table 2 and Figure 1.

Table 2. Mean Estimates* for Dependent Variables (Studies 2 to 5)

Study 2 (Warm vs Cold: Field Study)					
	Warm	Cold	Mean Difference	*p*-value	CI
Donation intentions	3.08 (.25)	2.35 (.22)	.73	**.04**	**(.03. 1.44)**
Message sharing	4.10 (.24)	3.43 (.21)	.67	**.05**	**(.00, 1.33)**
Study 3 (Warm vs. Cold: Post-Donation)					
	Warm	Cold	Mean Difference	*p*-value	CI
Connectedness	3.69 (.22)	3.87 (.22)	-.18	.57	(-.81, .45)
Perceived temperature	3.81 (.20)	4.07 (.20)	-.26	.35	(-.82, .29)
Positive emotions	3.76 (.23)	3.90 (.23)	-.14	.67	(-.79, .51)
	Study 4 (Donation vs. Purchase)				
	Donation	Purchase	Mean Difference	*p*-value	CI
Connectedness	3.74 (.23)	2.69 (.23)	1.05	**.01**	**(.39. 1.71)**
Empathy	4.39 (.22)	3.75 (.22)	.65	**.05**	**(.03, 1.26)**
Positive emotions	3.82 (1.79)	3.82 (1.57)	.00	1.00	(-4.71, 4.71)

**Mean estimates after controlling for NFT (autotelic), gender/age and smoking habits*

Source: Compiled by the authors based for Study 2, 3, 4

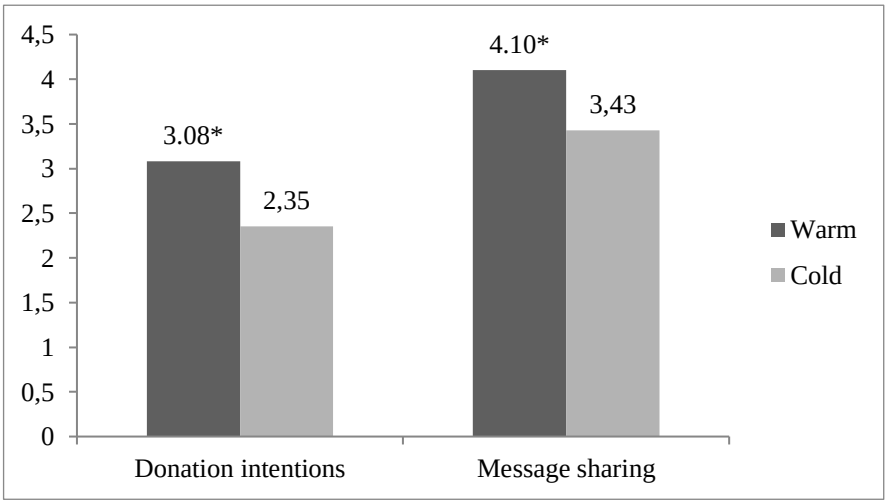

Figure 1. Post-Donation Responses (reverse-coded) in Study 2

Source: Data analysis for Study 2

Discussion. The field study results show that people who feel cold are more likely to donate and share the message. Such an act puts them in a better mood. The subsequent study confirms whether the donation was a compensatory consumption, as suggested in studies 1 and 2. If the donation is a compensatory act, the participants in both the cold and warm conditions should feel similar levels of warmth after donation.

Study 3: Impact of Temperature on Donation Intentions and Post-Donation Responses

Participants and Methods. One hundred and twenty participants recruited from Amazon Mechanical Turk (M-Turk) were randomly assigned to one of the two conditions (temperature: warm/cold). However, some responses were deleted after quality checks (e.g., straight-lining, quickly finishing the survey, failing attention checks). The warm and cold images of beverages and the PSA smoking ad were the same as the ones used in Study 1. In addition to images of beverages, hot and cold landscape images were included as part of the priming images (refer to Choi et al., 2016). Questions on temperature perceptions and NFA followed the priming pictures. After responding to questions on the NFA, participants viewed one anti-smoking ad and responded to queries on donation intentions, post-donation feelings, and perceived

temperature. Control factors include gender, autotelic NFT, and smoking habits. We used three measures to capture the effects of donation- temperature perception, positive emotions from the donations, and connection to others.

Results

Manipulation Check. The manipulation check confirmed the effectiveness of the temperature priming. Participants felt warmer after seeing the warm vs cold images (*M*warm = 5.62 (.62) vs *M*cold = 2.64 (.67); t (108) = 24.19, $p < .01$).

Donation Intentions. Regression analysis was conducted using Model 4 mediation of PROCESS (Hayes, 2013) with a bootstrap sample of 5,000 participants. We ran two models, one for cold and one for warm conditions. The perceived temperature was included as the independent variable, NFA as the mediator, and average donation amount as the dependent variable. NFA significantly mediated temperature perceptions and donation intentions for the cold condition (-6.39; CI (-11.83, -1.60)). The direct effect was not significant. As expected, we find that colder temperature increases NFA (β = -.50, $p < .01$), and NFA, in turn, increases donation intentions (β = 12.78, $p < .01$), replicating findings from Study 1. NFA did not significantly mediate temperature perceptions and donation intentions for the warm condition (-.12; CI (-3.17, 1.11)). The direct effect was also not significant, indicating that warmer temperatures did not influence NFA (β = .05, $p > .10$), nor was there an impact on donation intentions (β = -2.41, $p > .10$). Overall, we find that cold temperature perceptions are critical to donation intentions.

Post-Donation Responses. Next, we compared participants' post-donation reactions. An F-test with post-donation temperature perceptions was not significant (F (1, 105) = .89, $p > .10$), (M_{warm} = 3.81 (.20) vs. M_{cold} = 4.07 (.20); $p > .10$), after controlling for gender, smoking habit and NFT (autotelic). None of the covariates had a significant effect ($p > .05$). Similarly, post-donation positive emotions were not significantly different between the two conditions (F (1, 105) = .18, $p > .10$), (M_{warm} = 3.76 (.23) vs. M_{cold} = 3.90 (.23); $p > .10$). Only autotelic NFT had a significant effect ($p < .01$). The F-test with post-donation connectedness was not significant (F (1, 105) = .32, $p > .10$), (M_{warm} = 3.69 (.22) vs M_{cold} = 3.87 (.22); $p > .10$). Autotelic NFT was a significant covariate ($p < .01$). Overall, we find support for hypothesis 2a, 2b and 2c. The details of the results are provided in Table 2 and Figure 2.

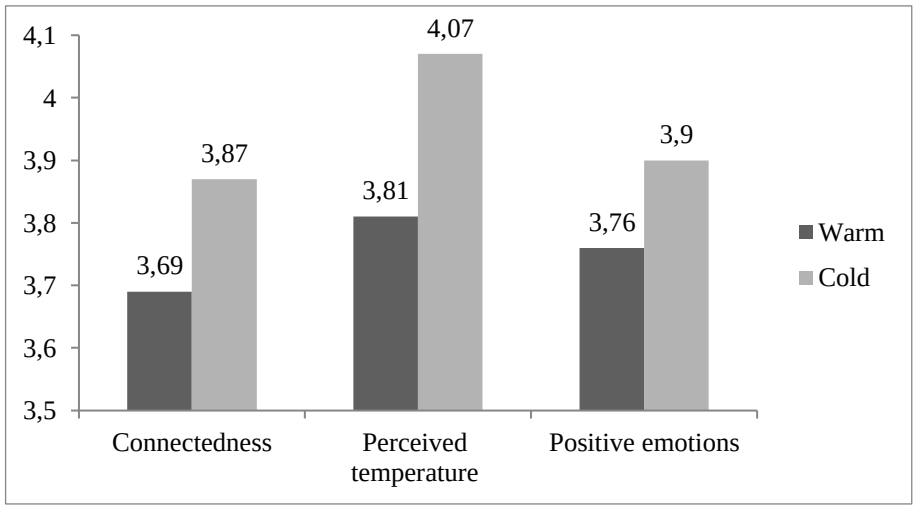

Figure 2. Post-Donation Responses in Study 3

Source: Data analysis for Study 3

Discussion. The first set of results replicates previous findings, suggesting that participants who feel colder were likely to report a higher NFA, leading to higher donation to the cause, but not for the warm condition. In the post-donation analyses, the F-tests revealed that participants feeling cold were more willing to donate, had positive emotions and felt connected to others when they got an opportunity to donate. Participants primed with warm and cold images have different temperature perceptions and the NFA before donation. However, after the donation task, participants in both conditions experienced similar temperature perceptions, positive emotions, and feelings of being connected. Together, these findings show that donation acts as a compensatory mechanism. In the following study, we examine how spending money with the motive to alleviate someone's condition is more effective than spending to improve one's mood and state.

Spending money on purchases can help people who feel excluded and disconnected from others find social relationships (Mead et al., 2010). However, donation compensates for the feeling of loneliness in the cold conditions and can also help fulfill the need to connect to others, while shopping for the self lacks the latter function. Thus, we test this premise through this study that donations will help reestablish social connections more effectively than other shopping tasks. In other words,

> ***H3:*** *For participants primed with cold images, donation (vs. shopping) is likely to (a) increase the feelings of connectedness and (b) empathy.*

Study 4: Difference in Giving: Buying or Donating

Participants and Methods. Participants located in the US were recruited from M-Turk to participate in the study for $1. Approximately 10% of the participants failed the attention check questions. Five participants were eliminated because they finished the survey too quickly (in less than three minutes), resulting in a final sample of 115 participants. In this study, all the participants were primed with cold images used in Study 3. Following the priming, participants reported their perceived temperature and responded to NFA questions. Next, half the participants were randomly assigned to a donation task, while the other half participated in a purchasing task after viewing the same anti-smoking PSA message. In the purchasing task, participants were asked about their interest in the Calvin Klein apparel ad and the amount they would spend on the t-shirt (adapted from Lee and Shrum, 2012) as a gift for others. Following the donation/purchase task, all participants responded to a question on connectedness. Authors also measured empathy, mood, and positive emotions from donations or purchases.

Results

Confound Check. We find that participants in the donation or purchase conditions did not show any differences in their temperature perceptions ($M_{donation}$ = 2.64 (.67) vs $M_{purchase}$ = 2.66 (.74); t (113) = .15; p > .10) and NFA ($M_{donation}$ = 2.29 (1.10) vs $M_{purchase}$ = 2.28 (.92); t (113) = .05; p > .10). In other words, since all participants were primed with cold images, they felt equally cold and had similar NFA. There were no differences in the moods of participants between the two conditions either ($M_{donation}$ = 5.14 (1.29) vs $M_{purchase}$ = 5.03 (1.42); t (113) = .43; p > .10). *Post-Donation Responses*. As expected, the authors find that participants felt significantly more connected after the donation task compared to the purchase task (F (1, 110) = 10.04, p < .01), ($M_{donation}$ = 3.74 (.23) vs $M_{purchase}$ = 2.69 (.23); p < .01), supporting hypothesis 3a. None of the covariates had a significant effect (p > .10). The authors also find that participants felt significantly more empathetic after the donation task in comparison to the purchase task (F (1, 110) = 4.33, p < .05), ($M_{donation}$ = 4.39 (.22) vs $M_{purchase}$ = 3.75 (.22); p < .05), supporting hypothesis 3b. For more details on the results refer to Table 2 and Figure 3. Furthermore, authors find that participants were willing to spend significantly more on the t-shirt than the donation ($M_{donation}$ = 14.10 (20.23) vs $M_{purchase}$ = 22.93 (13.81); t (113) = -2.75; p < .01) and their post-purchase positive emotions were similar to the post-donation positive emotions ($M_{donation}$ = 3.82 (1.79) vs $M_{purchase}$ = 3.82 (1.57); t (113) = .00; p > .10).

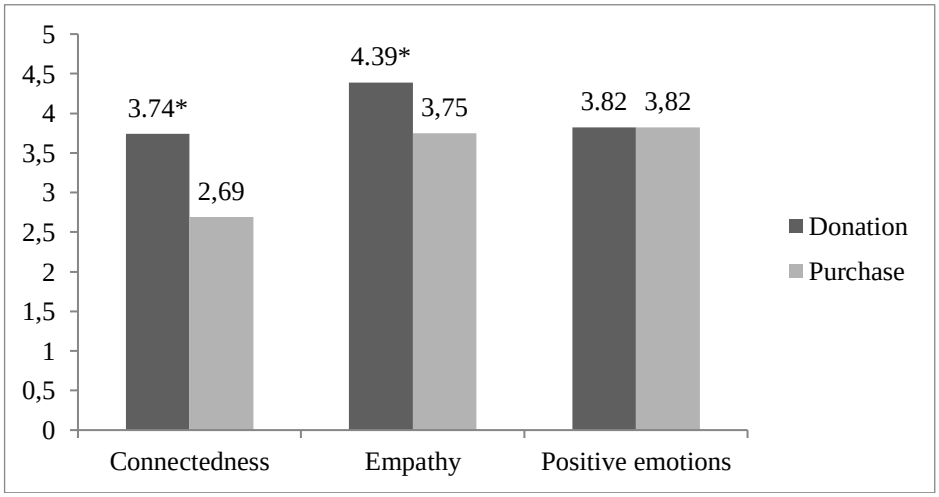

Figure 3. Post-Task Responses in Study 4

Source: Data analysis for Study 4

The results demonstrate that an alternative task like shopping while reporting a positive mood through spending money does not alleviate feelings of loneliness. While it might improve one's emotions, isolation is likely to persist. Thus, we show that donating behaviour is unique in that it not only makes one feel good (positive emotions), but it also helps an individual reconnect with others, thus fixing their socially deficient state.

Conclusions, Discussion and Recommendations

Our results from the four studies demonstrate that feeling cold can be an effective cue to increase donations. Feeling cold (vs. warm) increased the NFA, and this prompted higher empathy (Study 1) and donation intentions in participants after they viewed a PSA message (Studies 1 to 3). Moreover, donation, compared to purchase (Study 4), was the most effective in alleviating feelings of loneliness, filling the NFA, and increasing social connectedness. Combined, the studies reveal that warning messages are likely to be most effective in evoking charitable behaviours when people feel the discomfort of the cold. While discomfort is critical to initiate change, donation serves as the remedy to remove oneself from the discomfort. See Figure 4 for a summary of the results.

Control: Need for Touch (autotelic), Gender, Age, Smoking habits

Figure 4. Final Model Based on the Results of the Studies

Source: Compiled by the authors

The authors make three principal contributions to the existing literature. First, we contribute to the literature on social marketing by establishing conditions under which a PSA message is most effective- feeling cold. Second, our results establish when assimilative or compensatory embodiment effects will likely occur. Finally, we demonstrate how semantic priming and temperature salience are used to extract effects similar to touching something warm/cold and feeling warm/cold in ambient conditions. Most marketing studies have focused on the latter to elicit responses from participants.

Practical Implications. Loneliness will likely lead to various physical and mental health problems (Murthy, 2018). Through our study, we can show how PSA messages paired with an opportunity to donate can help alleviate feelings of loneliness and promote prosocial behaviours. Our study might be especially relevant to organizations like CDC and other NGOs. For instance, higher PSA budgets should be considered for the winter than summer. During summers, CDC can post messages near the freezer section of a supermarket or a food court. PSA could also be placed as banner ads on weather websites or apps and be scheduled based on that day's temperature. Additionally, study findings in the coffee shop field directly affect marketers. PSAs could be positioned for consumers who ordered iced coffee or tea beverages through mobile apps. Further, PSAs could have cues or explicitly suggest – "think of your loved ones" to trigger warm thoughts. In addition to considering the placement and timing of these messages, opportunities to share such messages could be provided. For instance, ads on the Internet could include a button for sharing the message or provide links to donation websites where viewers could take immediate action in donating to the cause. As demonstrated in Study 2, people are more likely to share a message when feeling lonely. Furthermore, a PSA message without a donation option might not be compelling.

Limitations and Future Research

Future research should consider how these other aspects of touch might influence a viewer's response to a PSA. Other interactions between sensory modalities, such as the impact of sound, smell, visual senses, and touch, can be further explored to strengthen the positive emotional effects of temperature. One of the field study limitations is that participants were not provided with real money for donations. Such a design could be considered in future studies. Also, only one type of PSA, the anti-smoking ad, was considered in this paper. Other PSA messages should be tested in the future to increase external validity. The findings demonstrated generalizability as the studies included samples from multiple populations, including different age groups beyond the typical college student population. We also surveyed via various modalities, from a

lab experiment field study to an online one. Moreover, the studies were conducted at different geographical locations in North America. Future research might extend these findings to different cultures and investigate whether the effects of touch and temperature are universal. In summary, authors find that PSA messages are more impactful when participants report feeling cold, whether through physical touch or primed through imagery. More importantly, we investigate the underlying psychological mechanism and propose boundary factors for when compensatory consumption might occur. Individuals feeling cold were driven to correct their psychological loneliness by reestablishing social connectedness via empathy and charity, thus demonstrating compensatory effects. On the other hand, people who are feeling warm are likely to show moderate to minimal levels of empathy and donation intentions. These results hold after controlling for NFT (autotelic), gender, age, and smoking habits.

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