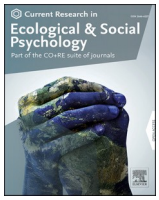
Current Research in Ecological and Social Psychology 6 (2024) 100172

Contents lists available at ScienceDirect

Current Research in Ecological and Social Psychology

journal homepage: www.elsevier.com/locate/cresp



Shockvertising: The effect of disgust exposure on viewers' nonconscious behavioral responses

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ARTICLE INFO

Keywords:
Disgust
Identity needs
Emotion
Compensatory consumption

ABSTRACT

Consumers frequently encounter disgusting images and disgust has been shown to produce a variety of behavioral responses when used in the context of advertisements or public service announcements. Building on theories of emotional appraisal and decision-making, we examine how physical and moral disgust differentially affect consumers' identity and compensatory consumption. An internal meta-analysis of eight studies we conducted shows that feelings of disgust threaten different aspects of self-identity, which in turn trigger various forms of compensatory consumption. In particular, we hypothesize and find that physical disgust decreases consumers' sense of power, which prompts them to act in a self-focused way to restore it (e.g., consume conspicuously). In contrast, moral disgust decreases consumers' feelings of belongingness, which prompts them to act prosocially (e.g., donate to charity). Marketers often employ disgusting images to break through the advertising clutter or to scare consumers into doing something (i.e., shockvertising, fear appeals). Our findings suggest that they should closely evaluate which disgust stimuli to use and the specific subconscious and behavioral consequences such images elicit.

1. Introduction

Ethical consumerism has been on the rise in the last few years and so have been purpose-driven advertising messages promoting socially responsible behavior (Yoon and Oh, 2016). Especially when messages relate to the environment (e.g., Greenpeace ads) or to unfair social practices and social injustice (e.g., UNICEF ads), the use of strong and shocking images is widespread. In fact, to break through the advertising clutter, marketers often aim at shocking their audience into paying attention to their messages by using strong images that are at odds with societal norms (i.e., *shockvertising*; Dahl et al., 2003). However, almost all the evidence regarding the effectiveness of shockvertising is either anecdotal or related to grabbing viewers' attention (Bushman and Lull, 2015; Gong and Chu, 2022).

Even though shockvertising is widely used, its effectiveness has never been conclusively demonstrated empirically in the marketing literature, and scholars have called for the examination of possible moderating factors (Bushman and Lull, 2015; Huhmann and Limbu, 2016; Peters et al., 2013; Witte and Allen, 2000). We think that one reason for a lack of conclusiveness is that effectiveness has often been measured in terms of attention-grabbing and social noise instead of in terms of elicited behavior (Brown et al., 2010; Sabri, 2012). Moreover, different typologies of shocking elicitors were often considered to be homogenous, instead of being classified based on the specific emotion they elicited (e.g., disgust, moral outrage, fear; Dahl et al., 2003; Morales et al., 2012). Finally, even when efforts were made to distinguish different emotions elicited and to measure actual behavior, the behavior being measured was compliance to the message itself, leaving other conscious or nonconscious behaviors unexplored (Dahl et al., 2003; Morales et al., 2012; Scudder and Mills, 2009).

Overall, these shortcomings limit the understanding of the consequences that shocking images used in advertising messages have on consumers. To address this gap, we posit that it is important to: 1) distinguish between different emotions used in shockvertising and, in particular, between physical and moral disgust elicitors; and 2) explore all typologies of behavioral tendencies that can arise from exposure to strong images, not just message compliance, but also nonconsciousbehavioral responses that are triggered by image aversiveness.

Distinguishing between different elicitors is particularly important because disgust is often used to shock, and although consumer research has generally viewed disgust as a homogeneous emotion (Argo et al., 2006; Morales et al., 2012; Morales and Fitzsimons, 2007),

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https://doi.org/10.1016/j.cresp.2023.100172
Received 30 June 2022; Received in revised form 3 September 2023; Accepted 2 December 2023
Available online 7 December 2023

psychological research has long viewed it as a heterogeneous emotion (Olatunji, 2008; Rozin et al., 2008). Research has identified two typologies of disgust: physical disgust and moral disgust (Lee and Ellsworth, 2013; Marzillier, 2004). Physical disgust is elicited by stimuli that bring about fear of oral incorporation (e.g., bodily products, cockroaches), whereas moral disgust arises when individuals are faced with behaviors that are deemed to be socially or morally unacceptable (e.g., racism, incest). Given that distinct emotions have different effects on cognitions, motivations, and behaviors, it is likely that different types of disgust may produce distinctly different types of behavioral responses as well.

Additionally, considering all behavioral tendencies that shocking images produce will help clarify the impact that shockvertising has on consumers beyond mere attention-grabbing, memorability, and compliance. It is important to explore whether aversive images trigger nonconscious behaviors and how this aversiveness threatens consumers' sense of self. There has been increasing evidence that emotions and sense of self are interrelated. For example, research has shown that who we are can define which emotions we are more (or less) attuned to (Morales and Wu, 2012), and that, if emotional events such as being exposed to shocking advertising are perceived as aversive and threatening to our sense of self, they will prompt nonconscious compensatory behaviors (Mandel et al., 2017). Therefore, the extent to which an advertisement will result in the desired consumer behavior (e.g., recycle, donate to charity) will also depend on the threatened aspect of the self that is triggering the response. Our research tests this proposition and proposes a framework to explain the underlying mechanism. We propose that feelings of disgust may threaten aspects of self-identity, which in turn trigger various forms of compensatory consumption.

1.1. Theoretical background

1.1.1. Physical and moral disgust: different emotions, different behaviors

Disgust is a particular emotion that has received significant attention in psychology, but surprisingly little attention in marketing and consumer research. Generally, disgust is defined as a feeling of revulsion or strong disapproval aroused by something unpleasant or offensive, and it is characterized by specific facial expressions (close nostrils, raised upper lip, gaping jaw), typical withdrawal behaviors (e.g., distancing from object eliciting disgust), and by certain physiological reactions (e.g., nausea). More specifically, disgust has been defined as "the body and soul emotion" (Rozin et al., 2008, 2005). Whereas an evolutionary account would define it as a basic emotion guarding the body against pathogens and toxins (e.g. avoidance of rotten foods), a more conceptual one would define it as a complex emotion that expanded to defend the self from figurative contamination as well (e.g., avoidance of death thoughts, social deviance).

Although disgust is often thought of as a homogenous construct, research has delineated different types of disgust. For example, Rozin et al. (2005) classify disgust along four categories: core disgust (e.g., rotten food, bodily products, cockroaches); animal-nature disgust (e.g., man with exposed intestines, person with poor personal hygiene); interpersonal disgust (e.g., direct or indirect contact with others that evokes strangeness, disease, misfortune); and moral disgust (e.g., moral offenses such as racism, murder). These different types of disgust have been shown to have distinct personality, behavioral, physiological, and clinical correlates (Olatunji et al., 2008). For example, in terms of personality traits, only animal-nature and core disgust seem to influence neuroticism whereas all types lead to behavioral inhibition (i.e., tendency to experience distress and to withdraw from unfamiliar situations, people, or environments). Additionally, physiological reactions also differ by the type of disgust elicited. For instance, relative to the other types of disgust, core disgust is more related to physiological responding on videos depicting vomit, and animal-nature disgust is more related to physiological responding on videos depicting blood. Finally, sensitivity to one or another type of disgust correlates with unique clinical symptoms. As an illustration, animal-nature explained unique variance in blood-injection-injury (BII) phobia, whereas interpersonal disgust predicted symptoms of contamination-based OCD and fear of animals (Connolly et al., 2008). These findings form the basis of our proposition that different types of disgust may produce qualitatively different responses.

The issue of treating disgust as a homogenous emotion highlighted for consumer behavior in general, applies also to the usage of different disgust typologies in shockvertising. According to Dahl and colleagues (2003), there are several typologies of shock appeals that are defined by the type of elicitor used, namely: 1) disgusting images; 2) sexual references; 3) profanity/obscenity; 4) vulgarity; 5) impropriety, 6) moral offensiveness; 7) religious taboos. However, a more appropriate classification, based on the emotional response such elicitors produce, would be to group "disgusting images" with "vulgarity" as physical disgust elicitors and to group the remaining ones as moral disgust elicitors. Accordingly, this newly proposed distinction not only is aligned with the psychology literature findings, but also allows for a better investigation of the impact of shocking advertising on consumers' behavior. This ability to better study the impact of shockvertising derives from the refined conceptualization of elicitors as similar (i.e., all shocking) but generating distinct emotions (i.e., physical versus moral disgust) thus leading to different behavioral tendencies.

Finally, it is important to note that shockvertising is not only used in fear appeals and public service announcements, but it is increasingly being used in charity advertising as well as in consumer goods advertising spanning from hygiene and food products to hotel chains and luxury goods (see Web Appendix A). Moreover, we find examples of physical and moral disgust being used indistinctly for all product categories and message typologies. Consequently, it is becoming extremely important to distinguish between physical and moral disgust elicitors in consumer behavior in general, and in advertising in particular. In fact, little is known about the interaction between disgust elicitors, product categories, and characteristics of the advertiser. Initial findings in this direction show that consumers' intentions to purchase products with aesthetic characteristics increase when moral disgust is elicited because moral violations can be disturbing, but simultaneously amusing (Guido et al., 2018) and that when for-profit organizations use shocking advertising consumers react more negatively than when a non-profit organization does (Yan and Chapa, 2020).

1.1.2. Emotions, self-threats, and compensatory consumption

The self is a complex construct. People hold self-views (self-identity) that, despite situational variations, are relatively stable over time. Moreover, people are motivated to maintain stable levels of these aspects of self-identity (identity motives; Vignoles et al., 2006), which include motives such as self-esteem, belongingness, control, and a meaningful existence (Williams, 2007). However, at times, certain situations or events can threaten these motives (e.g., poor performance, rejection by peers, being treated unfairly), and people generally react by attempting to bolster or repair the aspect of the self that is threatened. One way in which people may compensate for a particular threat is through consumption (termed *compensatory consumption*). For example, when feelings of power are threatened, people may respond by engaging in conspicuous consumption in an effort to restore their sense of power and control (Rucker and Galinsky, 2008). Recent research suggests that the responses to such self-threats depend on which needs are threatened (Lee and Shrum, 2012). For example, when relational needs are threatened (i.e., self-esteem, belongingness), people compensate by being more prosocial and affiliative (donate to charities, adjust product preferences to correspond to peers and partners). For a comprehensive review of prosocial consumer behavior, please refer to Small and Cryder (2016), where the authors extensively examine and analyze the various aspects of consumer behaviors characterized by prosocial tendencies. In contrast, when efficacy needs are threatened (i.e., power, meaningful existence), people compensate through conspicuous and status consumption. For an in-depth review of the associations between identity

motives and conspicuous consumption, please consult Pandelaere and Shrum (2022), where the authors thoroughly explore the underlying motivations driving conspicuous consumer behaviors.

Both emotion and self-identity have been widely studied by consumer researchers (Laros and Steenkamp, 2005; Reed et al., 2012), but with few exceptions (So et al., 2015), little research has investigated the relations between them. However, there is reason to think there may be a link. A threat to identity can be defined as an experience appraised as potentially harmful to the value, meaning, or enactment of an identity (Lee and Shrum, 2013) and in a similar fashion, situational appraisals can be affected by emotional experiences. In fact, situational appraisals can be shaped by emotional experiences corresponding to the specific cognitive appraisals that each emotion entails, and in case of aversive or threatening cognitions, they can signal danger to the sense of self.

The Appraisal-Tendency Framework (ATF; Lerner and Keltner, 2000) posits that emotions have distinct effects on judgment and decision-making, and that specific emotions give rise to specific cognitive and motivational processes, which account for the effects of each emotion on the content and depth of subsequent thought. More specifically, emotions differ on cognitive appraisal dimensions such as certainty, pleasantness, attentional activity, control, anticipated effort, and responsibility (Smith and Ellsworth, 1985). Appraisal theory also posits that emotions give rise to implicit cognitive predispositions to appraise future events in line with the central appraisal patterns that characterize the felt emotion (emotion-to-cognition). For example, those who experience the emotion of fear may appraise the situation as uncertain (appraisal dimension), and thus will be less willing to take risks (behavior aligned with appraisal dimension). Emotion and cognition are inherently integrated, and together they shape the appraisal of a situation. These appraisals, regardless of their accuracy, influence people's appraisals of their ability to cope with events and their consequences (Scherer, 2005, 1999, 1988; Smith and Lazarus, 1990; Storbeck and Clore, 2007).

Regarding disgust-specific appraisals that serve as basis for our predictions, Lee and Ellsworth (2013) demonstrated that physical and moral disgust differ on several cognitive appraisal dimensions, with physical disgust resembling fear (e.g., avoid and comply), and moral disgust resembling anger (e.g., approach and punish). Drawing on fear's appraisal structure, we predict that physical disgust (but not moral disgust) will be associated with situational appraisals of low power and coping potential (Lerner and Keltner, 2001). In contrast, given the connection of moral disgust with anger, we predict that moral disgust (but not physical disgust) will result in situational appraisals of low compatibility with moral standards (Roseman et al., 1990). The dimensions of coping potential and compatibility with standards are conceptually related to the self-identity motive of efficacy, which motivates individuals to maintain or enhance feelings of competence and control, and to the self-identity motive of relatedness, which drives individuals to maintain or enhance feelings of closeness to others (Vignoles, 2011). In fact, the appraisal of coping potential is defined as the ability of an individual to cope with an event, and it is related to various situational elements the individual evaluates (i.e., agent causing the event, motive of the agent, control, power, adjustment; Scherer, 1999). Among those, we find the one of control that is characterized as the degree to which the individual is able to control the event and its consequences, and the one of power, which is determined by the degree to which the individual is able to influence the emotion-eliciting event (Roseman et al., 1990; Smith and Ellsworth, 1985). According to the Appraisal-Tendency Framework predictions, we know that fear scores very low on appraisals of power (Lerner and Keltner, 2001; Scherer, 1988). Thus, we posit that when consumers experience feelings of physical disgust, they will appraise the situation in a similar way to when they are fearful, which will lead them to experience appraisals of low coping potential. Those appraisals will in turn threaten their need for power because people will cognitively assess that they are not in control, and that their coping potential towards the emotional event is low. Therefore, they will consume products that will help them restore their need for power, such as conspicuous or status-related products (Rucker and Galinsky, 2009, 2008). Thus, we hypothesized that consumers experiencing physical disgust would engage in power-restoring compensatory consumption.

In contrast, when consumers experience feelings of moral disgust, they will appraise the situation similarly to when they are angry, which will lead them to experience appraisals of low compatibility with moral standards. These appraisals, regardless of their accuracy, might lead to misperceptions that others are offensive, and thus may induce feelings that one does not belong, negative emotional reactions when one is associated with others, and the desire to distance oneself from others (Chu et al., 2013). According to evolutionary theory, the ability and desire to form social connections and to belong are the result of the processes of natural selection; desire for group membership serves the function of increasing chances for survival and reproductive suitability (Baumeister and Leary, 1995). When this need/ability is lacking, such as for those who feel disgusted with others, feelings of belongingness are diminished (Chu et al., 2013). Therefore, morally disgusted consumers will behave in a way that will help them restore their belongingness, such as donating to charity or engaging in helping behavior (Jonas et al., 2002; Lee and Shrum, 2012). We therefore hypothesized that consumers experiencing moral disgust would engage in belongingness-restoring compensatory consumption. A depiction of our conceptual model is presented in Fig. 1.

2. Material and methods: single-paper meta-analysis (SPM)

2.1. Study design

To test our hypotheses, we conducted a series of eight experiments using multiple manipulations and measures. The experimental design outline was the same for the eight studies. Participants were randomly assigned to review a series of stimuli (i.e., images or videos, IV) pretested to elicit either neutral feelings (control group) or feelings of physical or moral disgust (experimental groups). Subsequently, they reported how they felt while reviewing the stimuli (disgusted, morally outraged, sad, fearful, angry, etc.) or they responded to bogus questions regarding the stimuli (liking, novelty, etc.). Finally, participants completed an ostensibly unrelated study in which we measured the extent to which they compensated for their threatened need for power (via conspicuous or status consumption, DV PW) and belongingness (via helping behavior, DV BL).

2.2. Overview and participants

We tested the effect of physical and moral disgust on compensatory consumption in a series of $k = 8$ studies, with 1248 participants in total (629 males, age $M = 33.38$, $SD = 12.84$). Of the eight studies, one was conducted in the lab of a U.S. university ($n = 184$) and seven were conducted online using either Amazon's Mechanical Turk panel, Qualtrics panel, or a university participant online panel. Participants in all studies were from the U.S. (see Table 1 for study-specific details). In terms of gender composition between samples, while the percentage of female participants did not differ significantly between MTurk (45 % women) and Qualtrics panels (51 %), it is important to note that we observed a lower proportion of female participants in our online studies compared to those conducted in a university setting. Specifically, in the university setting, both lab and lab online panel studies consisted of 61 % female participants ($\chi^2 = 20.78$, $p < .001$). In terms of age, participants were younger and more homogeneous in university settings ($M_{lab} = 20.02$, $SD_{lab} = 1.33$; $M_{unionline} = 21.16$, $SD_{unionline} = 1.81$; $M_{mturk} = 36.07$, $SD_{mturk} = 11.09$; $M_{qualtrics} = 48.14$, $SD_{Qualtrics} = 14.39$; $F(3,1243) = 260.46$, $p < .001$).

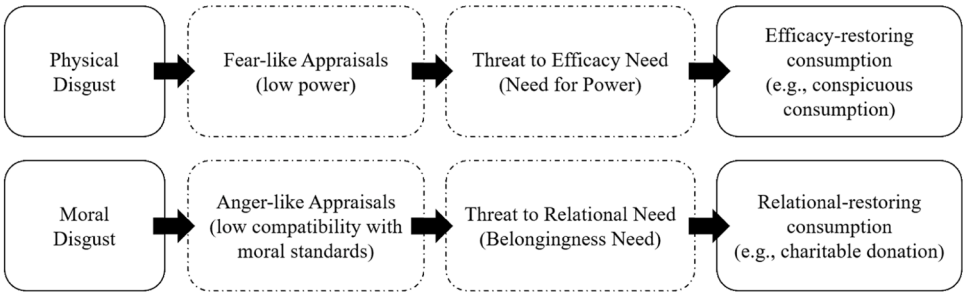

Fig. 1. Conceptual model.

Table 1
Description of study characteristics.

Study #	SAMPLE	IV	DV PW	DV BL	n	Male	Mean Age	Age SD
Study 1	Online - Mturk	IAPS-CJ	PW-WTP	BL-DD, BL-DL	80	36	37.19	10.93
Study 2	Online - Qualtrics	IAPS-CJ	PW-LL	BL-DD, BL-DL	107	52	48.14	14.39
Study 3	Online - Mturk	IAPS-W	PW-LL	BL-DD, BL-DL	150	94	35.36	11.07
Study 4	Online - Mturk	IAPS-CJ	PW-LL, PW-CC	BL-DD, BL-DL, BL-HB	248	135	35.81	11.61
Study 5	Online - Mturk	VID-CJ	PW-WTP	BL-DD, BL-DL, BL-HB	131	68	37.08	12.04
Study 6	Lab	VID-CJ	PW-WTP	BL-DD, BL-DL, BL-HB	184	72	20.02	1.33
Study 7	Online - Lab	VID-B	PW-WTP	BL-DD, BL-DL, BL-HB	114	45	21.16	1.81
Study 8	Online - Mturk	VIG	PW-LL	BL-DD, BL-DL	234	127	35.85	10.04

Note. Independent Variables: IAPS-CJR = emotion elicitation with pictures followed by emotional rating self-report; IAPS-CJW = emotion elicitation with pictures followed by written emotional self-report; VID-CJR = emotion elicitation with videographic material followed by emotional rating self-report; VID-*B* = emotion elicitation with videographic material followed by bogus questions; VIG-*B* = emotion elicitation using written vignettes followed by bogus questions. Dependent Variables: DV PW = power compensation; PW-WTP = willingness to pay for status-related goods, PW-LL = preference for larger brand logo; PW-CC = preferences for conspicuous logos; DV BL = belongingness compensation; BL-DD = charitable donation dollar amount; BL-DL = charitable donation likelihood; BL – HB = likelihood to help others.

2.3. Independent variables

Literature on emotion induction highlights various methodological approaches to manipulate human emotional responses, such as using pictures, films, facial action tasks, dyadic interaction tasks, autobiographical memory recall, and so on (Coan and Allen, 2007). Emotion researchers often use stimuli from previous experiments that become standardized and are collected in specific repositories (e.g., Center for Emotion and Attention, Swiss Center for Affective Sciences). However, one specific issue that we faced when we wanted to use standardized elicitation materials from past research repositories is that materials used to elicit disgust in the past were often meant to elicit only one specific typology, namely physical disgust. To overcome this problem, we often pre-tested existing materials (i.e., pictures) or we created our own (i.e., video clips, vignettes) so that we could reliably distinguish between feelings of physical and moral disgust.

In the present research, we elicited our target emotions using pictures, video clips, and written vignettes. An important variation that characterizes our manipulations is the extent to which participants were asked, or not, to reflect on their emotional experience (i.e., producing cognitive judgments; CJ). In fact, each stimulus was followed by either a cognitive evaluation of the emotional experience (e.g., "How does the image make you feel?") or some bogus questions (e.g., "How informative do you think the content was?"). Previous literature suggests that there is a difference in brain (i.e., amygdala) activation levels where certain cognitive tasks (e.g., picture recognition; "have you seen this picture before?") elicit low activation; making a cognitive judgment (e.g., rating or categorization; "how does this image make you feel?") about the emotional content of the stimuli elicits moderate activation; and simple passive viewing elicits the most activation (Coan and Allen, 2007; Liberzon et al., 2000). Given that there is no consensus on which elicitation technique is clearly superior, and given that consumers are likely to be exposed to a variety of stimuli in real life, we decided to use different approaches throughout the eight experiments to maximize the ecological validity of our findings. We provide a general description of each manipulation in the next section.

2.3.1. Emotion elicitation with pictures

In three studies, we elicited our target emotions using a subset of images from the International Affective Picture System (IAPS; Lang et al., 1999). The IAPS is a repository of photographs that serve as pre-tested, normative, emotional stimuli and they are available to researchers upon request. Together with the images, researchers are provided with a database containing ratings of arousal, valence, and dominance that have been collected for each individual photograph. According to the pleasure (or valence)–arousal–dominance (PAD or VAD) model of emotion classification, each emotional experience can be described using three dimensions: a) valence, defined as how positive/pleasant or negative/displeasing one feels an experience to be; b) arousal, defined as how energized or soporific one feels; and c) dominance, described as how controlling and dominant versus controlled or submissive one feels. The IAPS database contains ratings of these three descriptive dimensions for each individual image so that researchers can have some normative information about the stimuli they use.

However, given that the IAPS data does not distinguish which specific emotion is being elicited by which photograph, we first picked a set of images that we deemed disgusting and neutral only based on the content of the image itself. Afterward, we examined the ratings for each one, and we identified a subset of images that could be best suited to elicit feelings of physical disgust and moral disgust (e.g., high arousal, low valence, high dominance) together with images that could act as controls (e.g., low arousal, medium valence, low dominance). Finally, we pre-tested 28 images that fit our criteria and selected the final ones that we used in our experiments (see Web Appendix B). To elicit feelings of physical disgust, we used IAPS #1274, #9301, and #9321, whereas to elicit feelings of moral disgust, we adopted IAPS #6315, #9163, #9414, #9800, and #9810. As control stimuli, we employed IAPS #7045, #7055, #7059, #7150, #7175, and #7705.

Throughout the studies, we varied the subset of images that we used (from a set of three consecutive pictures with emotionally congruent contents in Study 1 to a single picture in Study 3), we varied the presentation style of the stimuli (consecutive pictures with emotionally congruent contents or non-consecutive pictures interspersed with neutral ones), and we varied the task that participants were asked to perform after viewing the stimuli by asking them to provide a cognitive judgment self-report about their emotional experience by either using a pre-determined rating scale (IAPS-CJR) or by producing a short written elaboration (IAPS-CJW). In Study 1, Study 2, and Study 4, as ostensibly part of a study about how people respond to pictures that represent different life events, participants were shown the target images and rated each on a 7-point scale (1 = not at all, 7 = very much) on the extent to which they felt particular emotions while viewing them (i.e., grossed out, disgusted, queasy, fearful, angry, mad, furious, morally outraged, sad, happy, amused, confused). In Study 3, after the stimulus presentation, participants were asked to briefly describe how the image made them feel. For more information about specific emotion induction procedures, please refer to Table 2.

2.3.2. Emotion elicitation with videographic material

According to the emotion elicitation literature, using video clips is an effective and ecologically valid way to induce discrete emotional states (Gross and Levenson, 1995). In creating our stimuli, we used existing TV programs for which we identified scenes that would elicit our target emotions and subsequently edited them to be homogeneous and approximately 4-minutes long (Rottenberg et al., 2007). We created and pre-tested 8 video clips before we selected the final three that we used in our experiments (see Web Appendix C). We used a clip of a TV show on the story of a woman having a parasite being removed from her body to elicit feelings of physical disgust, whereas we used a clip depicting a journalist of color confronting a crowd of neoNazis in Germany to elicit feelings of moral disgust. For participants in the control condition, we used a video clip of a documentary on how pavers are made. In Study 5 and Study 6, as ostensibly part of a study about how people respond to scenes they see on TV, participants were shown the target video clip and rated on a 7-point scale (1 = not at all, 7 = very much) the extent to which they felt particular emotions while watching it (i.e., grossed out, disgusted, queasy, fearful, angry, mad, furious, morally outraged, sad, happy, amused, confused). In Study 7, participants were also told they were taking part in a TV scene evaluation study but, after they watched the target video clip, they were asked to respond to a series of bogus questions that did not require a cognitive judgment about their emotional experience (see Web Appendix C).

2.3.3. Emotion elicitation with written vignettes

Another common method to elicit disgust, both with and without its moral component, is to have participants read short emotion-inducing stories (Antfolk et al., 2012; Horberg et al., 2009; Jones and Fitness, 2008; Schnall et al., 2008). Given that we were not able to find vignettes that specifically discriminated between physical and moral disgust, we created and pretested nine short stories based on real-life events we read about in the news/online (See Web Appendix D). We used a story of a doctor finding a piece of rotting bread between the fat folds of his obese patient to elicit feelings of physical disgust, whereas we used a story of a dirty doctor raping terminally ill girls at the hospital to elicit feelings of moral disgust. In the control condition, we had participants read a story about drinking coffee in Cuba. In Study 8, as ostensibly part of a study about how people respond to written material, participants were asked to read a randomly selected book excerpt and then to express their agreement or disagreement with a series of decoy statements about it: "I would definitely buy this book," "I find this excerpt to be intriguing," "The excerpt is well written," and "I would be willing to read more about this."

2.4. Dependent variables

We examined the impact of physical and moral disgust exposure on compensatory consumption with previously established measures. To investigate consumer compensation to a power threat we used

Table 2
Summary of emotion elicitation stimuli and procedures.

Emotion Elicitation Procedures			Neutral	Physical Disgust	Moral Disgust
Study 1	IAPS-CJR	Three consecutive pictures with emotionally congruent target contents (neutral, physical disgust, moral disgust) followed by emotional self-report. See Web Appendix B.	IAPS # 7055, 7045, 7059	IAPS # 9301, 9321, 1274	IAPS # 9800, 9414, 9163
Study 2	IAPS-CJR	Two randomly selected neutral pictures followed by two pictures with target emotional contents (neutral, physical disgust, moral disgust) followed by emotional self-report. See Web Appendix B.	IAPS # 7055, 7045, 7059, 7150, 7175, 7705	IAPS #9301, 1274	IAPS # 9800, 9414
Study 3	IAPS-CJW	One picture with target emotional content (neutral, physical disgust, moral disgust) followed by written elaboration. See Web Appendix B.	IAPS # 7055	IAPS # 1274	IAPS # 9800
Study 4	IAPS-CJR	Two consecutive pictures with emotionally congruent target contents (neutral, physical disgust, moral disgust) followed by emotional self-report. See Web Appendix B.	IAPS # 7055, 7045, 7059, 7150, 7175, 7705	IAPS # 1274, 9301	IAPS # 6315, 9810
Study 5	VID-CJR	One 4-minute video with emotionally congruent target content (neutral, physical disgust, moral disgust)	Documentary on how pavers are made (https://youtu.be/58v0B6D8lvE)	Woman having a parasite being removed from her body (https://youtu.be/xcjiv3o0dl8)	Journalist of color confronting a crowd of neoNazis in Germany (https://youtu.be/_MIpjuqhZCU)
Study 6	VID-CJR	One 4-minute video with emotionally congruent target content (neutral, physical disgust, moral disgust)			
Study 7	VID-B	One 4-minute video with emotionally congruent target content (neutral, physical disgust, moral disgust)			
Study 8	VIG-B	One written story with emotionally congruent target content (neutral, physical disgust, moral disgust). See Web Appendix D for full text.	Story of a doctor finding a piece of rotting bread between the fat folds of his obese patient.	Story of a dirty doctor raping terminal ill girls at the hospital.	Story about drinking coffee in Cuba.

Note. Independent Variables: IAPS-CJR = emotion elicitation with pictures followed by emotional rating self-report; IAPS-CJW = emotion elicitation with pictures followed by written emotional self-report; VID-CJR = emotion elicitation with videographic material followed by emotional rating self-report; VID-*B* = emotion elicitation with videographic material followed by bogus questions; VIG-*B* = emotion elicitation using written vignettes followed by bogus questions.

willingness to pay for status-related products, preference for larger brand logos, and preference for conspicuous brand logos, which are widely used in the literature to measure power compensation following an efficacy self-threat (Otterbring et al., 2018; Panchal and Gill, 2020; Sivanathan and Pettit, 2010). To investigate consumer compensation to a belongingness threat we used willingness to donate to charity in terms of likelihood and dollar amount, and willingness to engage in helping behavior, which are also widely used in the literature as compensatory behavior measures following a relational self-threat (Jonas et al., 2002; Lee and Shrum, 2012). We provide a general description of each dependent variable operationalization next.

2.4.1. Willingness to pay for status-related products

In Study 1, 5, 6, and 7, our measured efficacy restoration was participants' stated willingness to pay for status-related products (Rucker and Galinsky, 2008). In Study 1, we showed participants five luxury products (i.e., fountain pen, wristwatch, leather briefcase, tie, fur coat) and asked them how much they would be willing to pay for them at this moment on a 12-point scale, from 1 = 10 % of the retail price of the item to 12 = 120 % of the retail price. In Studies 5, 6 and 7 we showed participants only a subset of those luxury products (i.e., fountain pen, wristwatch). The items were averaged to form a composite score (α_{study1}=0.77, α_{study5} =0.73, α_{study6} =0.51, α_{study7} =0.56), with higher values indicating a higher willingness to pay for status-related goods.

2.4.2. Preference for larger brand logos

In four studies (Studies 2, 3, 4, 8), our key measure of power compensation was the preference for a larger brand logo on a product that we adapted from Lee and Shrum (2012). We asked participants to consider a scenario in which Ralph Lauren was ready to launch a newly designed T-shirt, but before the launch, the company wanted to pilot-test consumer preferences. Participants were asked to imagine they were going to buy a new polo shirt at that moment. The operationalization of large versus small logos choice was slightly different throughout the studies (Web Appendix E). In Study 2, all participants were shown five images of a Ralph Lauren polo shirt with logos proportionally increasing in size from the first shirt to the last and they were asked to express their preferences on four items (choice, appeal, willingness to pay, attractiveness) on a 5-point scale, with each scale point representing a polo shirt ranging from "polo 1″ to "polo 5″. In studies 3, 4, and 8, participants were then shown two images of a Ralph Lauren polo shirt, one with a prominent, visible logo and one with a small, less conspicuous logo. They expressed their preferences for the same four items from study 2, but on a 9-point scale anchored at "1 definitely polo A" and "9 definitely polo B". In all studies, the four items were averaged to form a composite score (α_{study2}=0.98, α_{study3} =0.98, α_{study4}=0.97, α_{study8} =0.98), with higher values indicating a greater preference for the conspicuous Ralph Lauren logo.

2.4.3. Conspicuous consumption scale

In Study 4, we measured preferences for conspicuous consumption using the scale developed by Rucker and Galinsky (2009). Specifically, we asked participants to imagine they were buying a piece of high-end clothing and then to indicate their preferences for conspicuous brand logos on a 9-point scale comprising four items, anchored by visible/nonvisible, big/small, noticeable/unnoticeable, and conspicuous/inconspicuous. The four items were averaged to form a composite score (α=0.89), with higher values indicating a greater preference for conspicuous logos.

2.4.4. Charitable donation: likelihood and amount

In all eight studies, we used charitable donation intentions as a proxy for belongingness threat compensation. Participants read the following scenario: "Imagine that while you are standing in the checkout lane at a grocery store, you find the following donation campaign posted around the checkout lane. "One in seven babies is born prematurely in the US. Prematurity is the leading cause of newborn death. Join us in the fight to give every baby a healthy start. Donate Today!" If you were in this situation at this very moment, how likely would you be to make a donation?".

Next, we measured their likelihood to donate by asking them the following: "If you decide to make a donation, how much money would you donate at this very moment?" (1 = not at all likely; 9 = very likely). Finally, we asked participants to indicate how much money they would have been willing to donate at that very moment (open-ended, dollar amount).

2.4.5. Helping behavior

In addition to charitable donation intentions, in Studies 4 to 7, we measured belongingness compensation as likelihood to help others in need. We adapted six hypothetical scenarios depicting opportunities to help others from DeWall et al. (2008) and we asked participants to express their likelihood to help on a 9-point scale (1 = not at all likely, 9 = very likely). The scenarios depicted opportunities to help others in various forms such as by giving money to a homeless person, donating money to a fund for children with terminal illnesses, offering a ride to an unknown neighbor whose car had broken down, giving directions to a lost stranger, allowing a stranger to use one's cell phone, and giving food to a homeless person (Web Appendix F). The scores from the six scenarios were averaged to form a composite score (α_{study4}=0.76, α_{study5} =0.67, α_{study6} =0.52, α_{study7} =0.53), with higher values indicating a greater likelihood to help others.

2.5. Meta-Analytic approach

In the social sciences field there has been increasing consensus about the benefits of using meta-analytic approaches to enhance replicability, prevent sampling error, and reduce publication bias (Braver et al., 2014; Cumming, 2014; Goh et al., 2016; Mcshane and Böckenholt, 2017; Schmidt and Hunter, 2014). For example, at the single-study level, sampling error is a random non-estimated event, whereas at the aggregate meta-analysis level, it can be estimated and corrected for. Additionally, meta-analysis allows researchers to use point estimates and confidence intervals instead of relying merely on significance testing and statistical power. If, like in the case of the present research, all conducted studies are included (i.e., an empty file drawer), and for each included study, exactly one analysis was attempted (Vosgerau et al., 2019), adopting meta-analytic thinking within studies that appear in a single paper could help reduce harmful practices that hinder the cumulation and advancement of knowledge, as well as provide multiple other advantages (Mcshane and Böckenholt, 2017).

In line with these observations and with the current debate on the perils of data-selection bias in our field, we aimed to provide a conservative estimation based on the full data that we collected internally within our research project. We believe that our studies are best interpreted as a data point in a broader data set to be analyzed. A meta-analytical approach is advocated when researchers want to study a potentially small effect with multiple studies, because a very large sample size would be required for each single study to be significant. This view is supported by our post-hoc power calculations that highlight the high number of participants we would need in our sample if we were to conduct a "single perfect experiment" with the recommended power level of 80 % (see Table 3). All power estimates are obtained with the software G*Power version 3.1.9.2 (Faul et al., 2007).

In analyzing our results, we followed a random-effects meta-analytic model because our objective was to generalize findings beyond the set of studies analyzed, and because we used several operationalizations of both independent and dependent variables (Borenstein et al., 2010; Tufanaru et al., 2015). We combined our studies using an inverse variance meta-analysis with Revman version 5.3, and we calculated the weighted standardized mean difference (SMD) between experimental and control groups together with its 95 % confidence interval. We ran

Table 3
Post hoc achieved power and optimal sample size calculations.

Study #	Actual n	DV PW	η2	Effect Size f	Achieved Power Level	Optimal n*	DV BL	η2	Effect Size f	Achieved Power Level	Optimal n*
Study 1	80	PW-WTP	.01	.12	\0.14	682	BL-DD	.01	.09	.10	1263
							BL-DL	.04	.20	.34	234
Study 2	107	PW-LL	.05	.24	.58	172	BL-DD	.05	.22	.50	207
							BL-DL	.02	.12	.19	636
Study 3	150	PW-LL	.02	.13	.27	570	BL-DD	.00	.04	.07	5661
							BL-DL	.02	.13	.28	554
Study 4	248	PW-LL	.01	.12	.39	640	BL-DD	.02	.15	.53	448
							BL-DL	.01	.11	.34	734
		PW-CC	.01	.07	.16	1846	BL-HB	.03	.19	.74	284
Study 5	131	PW-WTP	.04	.20	.51	246	BL-DD	.00	.02	.05	24,080
							BL-DL	.01	.08	.12	1390
							BL-HB	.01	.11	.18	803
Study 6	184	PW-WTP	.00	.04	.07	6875	BL-DD	.02	.13	.32	588
							BL-DL	.00	.06	.10	2597
							BL-HB	.01	.11	.24	803
Study 7	114	PW-WTP	.03	.17	.33	344	BL-DD	.00	.05	.07	3562
							BL-DL	.01	.10	.14	997
							BL-HB	.02	.15	.27	435
Study 8	234	PW-LL	.01	.10	.23	1064	BL-DD	.00	.04	.08	6875
							BL-DL	.02	.13	.38	611

*sample size required to achieve a power of 80 %.
Note. Dependent Variables: DV PW = power compensation; PW-WTP = willingness to pay for status-related goods, PW-LL = preference for larger brand logo; PW-CC = preferences for conspicuous logos; DV BL = belongingness compensation; BL-DD = charitable donation dollar amount; BL-DL = charitable donation likelihood; BL-HB = likelihood to help others.

the analyses for both the power threat compensation effect of physical disgust exposure and for the belongingness threat compensation effect of moral disgust exposure. Specifically, for each individual study mean, the software computed an effect size (Cohen's d or SMD) by taking the mean differences on the dependent variables in each target experimental group (control vs. physical disgust, control vs. moral disgust) and dividing them by the pooled standardized difference. The differences were computed by subtracting the mean dependent variable score in the control condition from the same score in the experimental condition (physical disgust or moral disgust). Therefore, a negative effect size (negative SMD) means that participants in the physical and moral conditions engage in compensatory consumption more than those in the control condition, and thus provides evidence for our hypothesized effect.

In addition to the effect size *d*, we provide three statistics that give additional information about our effects. First, we report the *Z*-value that allows us to determine whether our mean effect size is significant via null hypothesis testing. Second, we present the I^2, which measures the proportion of observed variance that reflects real differences in effect size (Borenstein et al., 2009; Cooper et al., 2009). The I^2 index assesses the level of heterogeneity among studies. If I^2 is close to 0 %, then the observed variance is mostly spurious, whereas if I^2 is close to 100 %, there is a need to investigate this variance further to understand its origin. If I^2 is moderate (25 %) to high (75 %), the results of the individual studies should not be pooled (Higgins and Thompson, 2002). Third, we report τ^2, which is the variance of the effect size parameters across the population of studies. Thus, τ^2 reflects the variance of the true effect sizes and as a measure of dispersion is often used together with I^2 (Borenstein et al., 2009).

Finally, we provide a graphical representation of our results (i.e., forest plot). The forest plot graph is divided into two columns: the left-hand column lists the name of the studies and the right-hand column plots the effect estimates (SDM). In addition to displaying study names, the left-hand column can be organized in sub-groups to perform subgroup analyses. Subgroup analysis can be used to compare the overall estimated effect with the effect computed for only those studies that share some attributes (e.g., sample characteristics, study characteristics). In our case, we conducted two subgroups analyses: one for dependent variable operationalization (i.e., power threat operationalizations, and belongingness threat operationalizations) and one for independent variable operationalization (i.e., emotion elicitation typology). We did not conduct a sub-group analysis by sample characteristics because we thought that there is not enough variation to warrant one. In fact, only one study out of eight was conducted in the lab (versus online), and all studies had U.S. respondents.

The right-end column also contains a chart listing the numerical values for means, standard deviations, and sample sizes of the experimental and control groups being compared within each study. In the forest plot, there are several graphical elements that help the reader interpret the numeric results at a glance: 1) green square boxes representing the effect size point estimates and the study weights (i.e., the bigger the box the bigger the weight); 2) horizontal lines representing the confidence intervals for the estimated effects; 3) a black diamond at the bottom representing the overall meta-analyzed measure of effect (and a similar but smaller black diamond at the bottom of each subgroup analysis); 4) a vertical line (y-axis) representing no effect, such that if the confidence intervals for individual studies overlap with this line, it indicates that at the given level of confidence, their effect sizes do not differ from no effect for the individual study (the same applies for the overall meta-analyzed measure of effect); 5) the horizontal distance (x-axis) of a box from the y-axis represents the standardized mean difference between experimental and control mean.

3. Results

3.1. Power threat compensation

The averaged corrected standardized mean difference for the effect of physical disgust exposure on power threat compensatory consumption is $d = 0.13$, 95 % CI [.01, .26], $Z = 2.09$, $p = .04$. In contrast, the averaged corrected standardized mean difference for the effect of moral disgust exposure on power threat compensatory consumption is not significant ($d = 0.02$, 95 % CI [−0.30,.35], $Z = 0.15$, $p = .88$). However, a post-hoc analysis indicates that while the difference between the two effect sizes does not reach conventional levels of significance, there is a noteworthy trend in the hypothesized direction ($Z = 1.19$, $p = .117$). It is important to consider that the cumulative sample size for this specific analysis is relatively modest, which may contribute to the observed trend not achieving standard levels of statistical significance. Consequently, the results of the meta-analysis partially support our first

hypothesis, indicating that being exposed to physically disgusting stimuli increased the tendency to engage in conspicuous consumption relative to the control group while being exposed to morally disgusting stimuli did not increase compensation relative to the control group. Furthermore, when examining the result of our focal analysis (physical disgust vs. control), we find that the I^2 statistic reveals minimal heterogeneity (0 %), and the τ^2 statistic fails to reach significance, which jointly indicates that the studies provide a homogeneous test of the effect, indicating that the differences between individual studies are mainly due to sampling error and not to real differences in effect sizes.

The forest plots in Figs. 2–5 provide a graphical summary of our meta-analysis calculations for the target comparison (i.e., physical disgust vs. control) and the non-target comparison (i.e., moral disgust vs. control). The graphs report the effect sizes and confidence intervals of the individual studies, the effect size of the overall effect, and the results of the subgroup analyses. In addition to the main meta-analysis, we conducted two post-hoc subgroups analyses: one for individual dependent variable operationalizations (displayed in Figs. 2 and 3) and one for

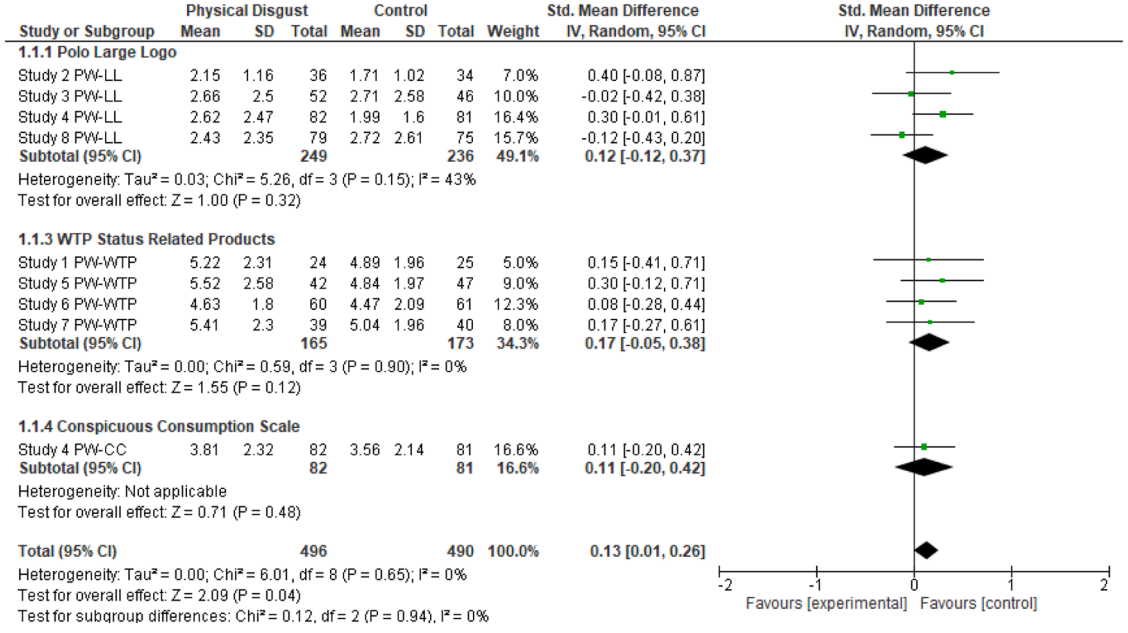

Fig. 2. Forest plot of comparisons between the physical disgust and control conditions for individual operationalizations of power threat compensation.
Note. Dependent Variables: DV PW = power compensation; PW-WTP = willingness to pay for status-related goods, PW- LL = preference for larger brand logo; PW – CC = preferences for conspicuous logos; DV BL = belongingness compensation; BL – DD = charitable donation dollar amount; BL – DL = charitable donation likelihood; BL HB = likelihood to help others.

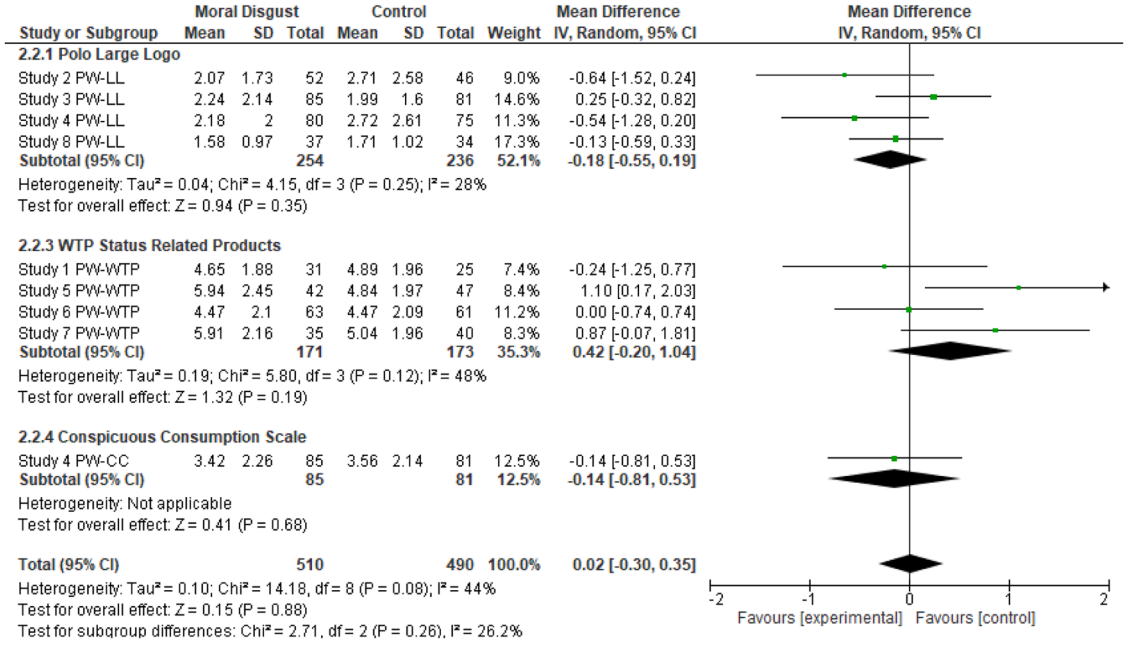

Fig. 3. Forest plot of comparisons between the moral disgust and control conditions for individual operationalizations of power threat compensation.
Note. Dependent Variables: DV PW = power compensation; PW-WTP = willingness to pay for status-related goods, PW- LL = preference for larger brand logo; PW – CC = preferences for conspicuous logos; DV BL = belongingness compensation; BL – DD = charitable donation dollar amount; BL – DL = charitable donation likelihood; BL – HB = likelihood to help others.

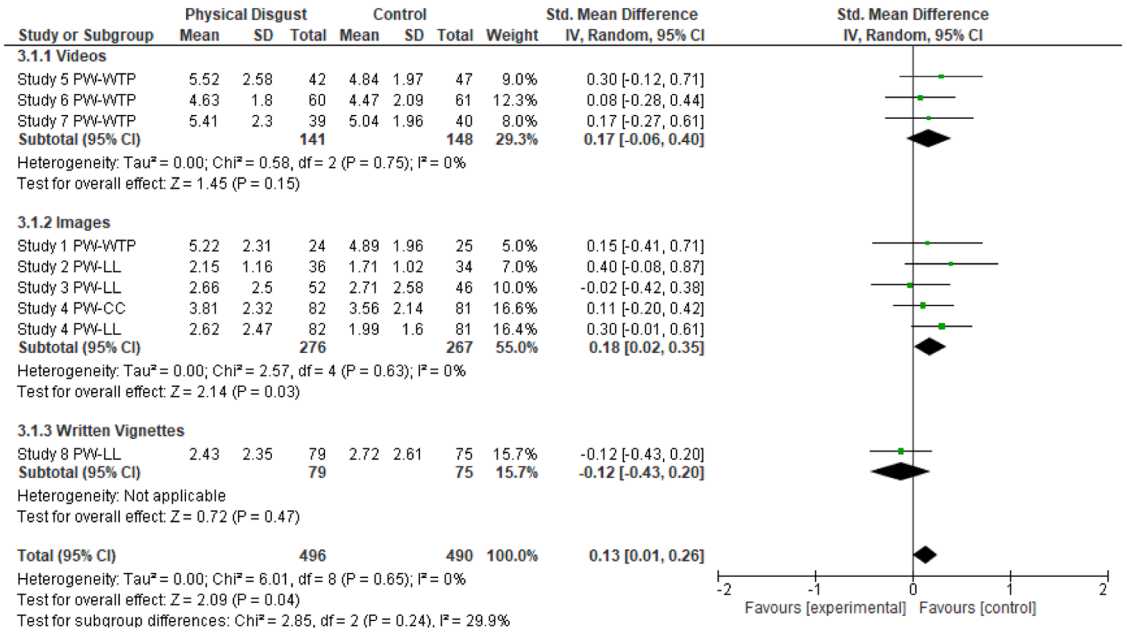

Fig. 4. Forest plot of comparisons between the physical disgust and control conditions for individual operationalizations of the independent variable.
Note. Independent variable: emotion elicitation with Videos, Images or Written Vignettes.

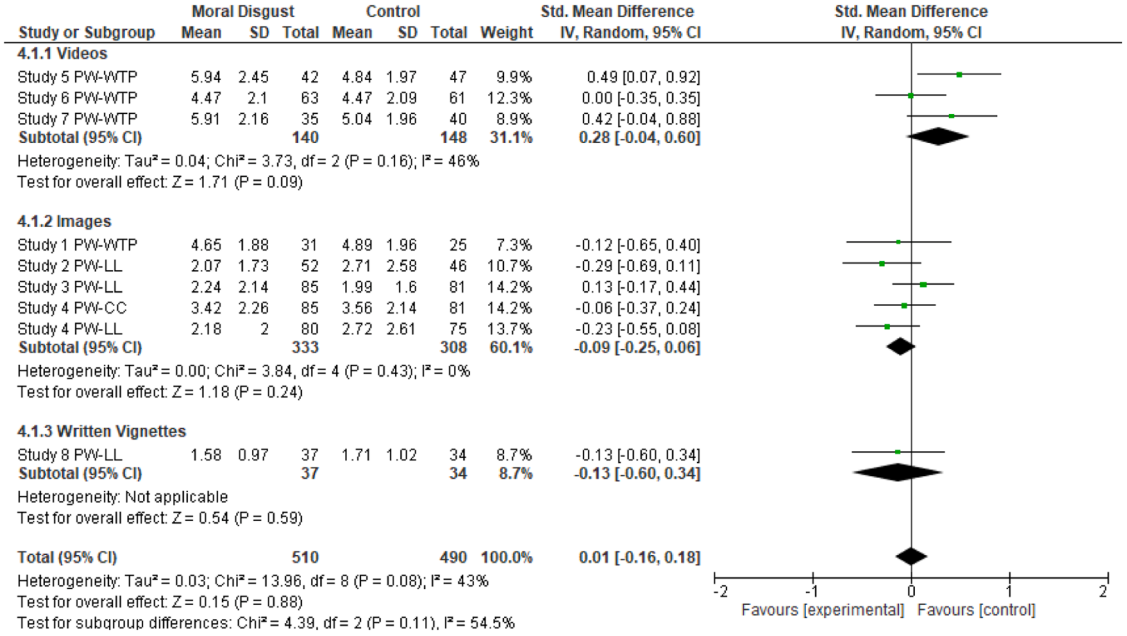

Fig. 5. Forest plot of comparisons between the moral disgust and control conditions for individual operationalizations of the independent variable.
Note. Independent variable: emotion elicitation with Videos, Images or Written Vignettes.

individual independent variable operationalizations (displayed in Figs. 4 and 5). Specifically, for our target comparison, the subgroup analysis for the individual operationalizations of power threat used (i.e., willingness to pay for status products, conspicuous consumption scale, and preference for larger brand logos) indicated no significant difference between the three subgroups (χ^2 =0.12, $df = 2, p = 0.94$). Moreover, the second subgroup analysis for the individual independent variable operationalizations used to elicit emotions (i.e., pictures, videos, written vignettes) also indicated no significant difference between the three subgroups ($\chi^2 = 2.85$, $df = 2$, $p = 0.24$). These results suggest that regardless of the operationalization used to measure the dependent variable and of the operationalization used to elicit physical disgust, the effect of physical disgust on power compensation is homogenous.

3.2. *Belongingness threat compensation*

The averaged corrected standardized mean difference for the effect of moral disgust exposure on belongingness threat compensatory consumption is $d = 0.13$, 95 % *CI* [.04, 0.21], $Z = 2.94$, $p < .001$. The forest plot in Fig. 6 reports the effect sizes and confidence intervals of the

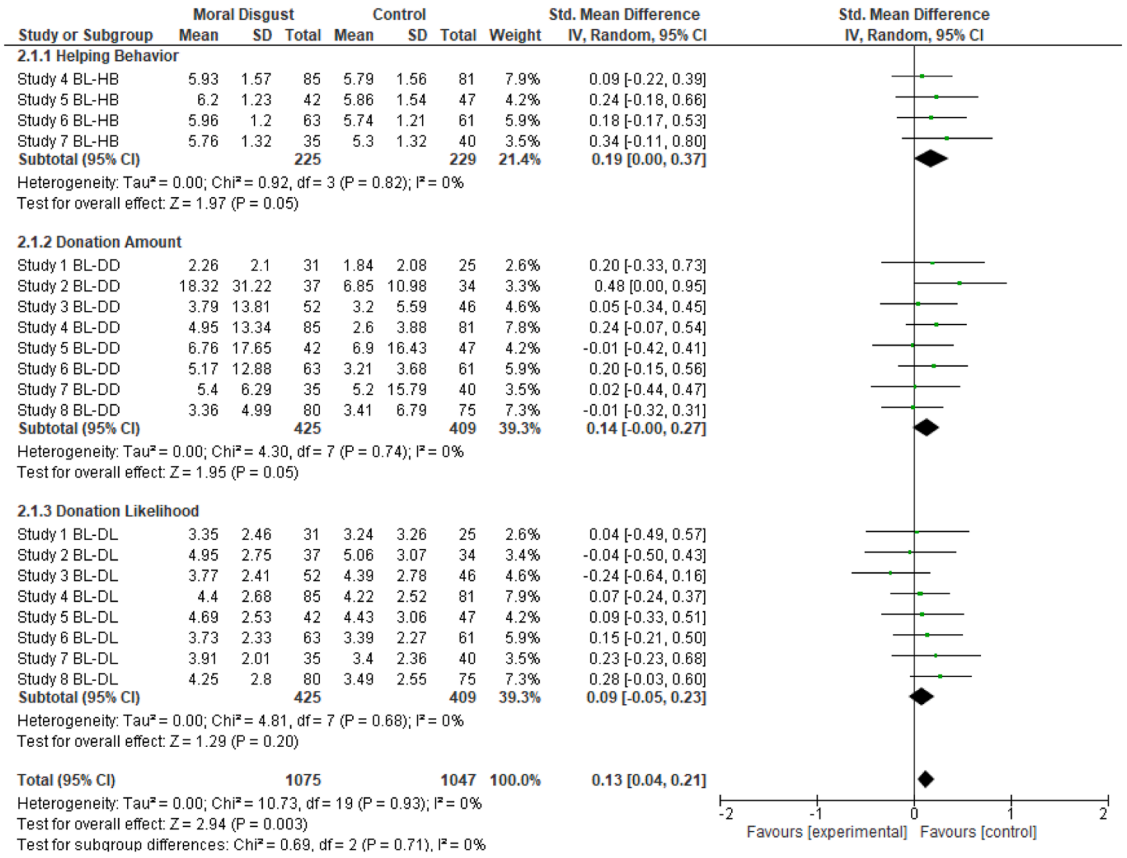

Fig. 6. Forest plot of comparisons between the moral disgust and control conditions for individual operationalizations of belongingness threat compensation.
Note. Dependent Variables: DV BL = belongingness compensation; BL – DD = charitable donation dollar amount; BL – DL = charitable donation likelihood; BL – HB = likelihood to help others.

individual studies, individual dependent variables and overall estimate. The results of our meta-analysis support our second hypothesis and indicate that viewing moral disgust images increased charitable or other-focused consumption relative to the control group, but viewing physical disgust images did not (see Fig. 7). In fact, the averaged corrected standardized mean difference for the effect of physical disgust feelings on belongingness threat compensatory consumption is not significant (d =−0.03, 95 % *CI* [−0.12,.06], $Z = 0.59$, $p = .55$), and post-hoc analyses revealed that this effect size is significantly different from the one for moral disgust vs. control ($Z = 1.84$, $p = .033$). Furthermore, when examining the results of our hypothesis test (Fig. 4), we see that the I^2 statistic again reveals minimal heterogeneity (0 %), and the τ^2 statistics fails to reach significance.

The forest plots in Figs. 6–9 provide a graphical summary of our meta-analysis calculations for the target comparison (i.e., moral disgust vs. control) and the non-target comparison (i.e., physical disgust vs. control) respectively. Again, we conducted two post-hoc subgroups analyses: one for individual dependent variable operationalizations (displayed in Figs. 6 and 7) and one for individual independent variable operationalizations (displayed in Figs. 8 and 9). For our target comparison, the subgroup analysis for the individual operationalizations of belongingness threat used (i.e., helping behavior, donation amount, donation likelihood) indicated no significant difference between the three subgroups (χ^2 =0.69, $df = 2$, $p = 0.71$). These results suggest that regardless of the operationalization used to measure the dependent variable and of the operationalization used to elicit moral disgust, the effect of moral disgust on belongingness compensation is homogenous. Moreover, the second subgroup analysis for the individual independent variable operationalizations used to elicit emotions (i.e., pictures, videos, written vignettes) also indicated no significant difference between the three subgroups ($\chi^2 = 6.57$, $df = 8$, $p = 0.58$).

4. General discussion

Our findings suggest that exposure to physical disgust and moral disgust elicit different compensatory behaviors. Specifically, our results indicate that physical disgust exposure is associated with an increased tendency to engage in power threat compensation behaviors, while moral disgust exposure is linked to a greater inclination to engage in belongingness threat compensation behaviors. However, it is crucial to approach the interpretation of our meta-analytic results with caution. While our meta-analysis suggests consistency in these patterns across a range of emotion elicitation techniques, including images, videos, and written vignettes, as well as across various dependent variable operationalizations for both power (e.g., willingness to pay for status-related products, conspicuous consumption scale, preference for larger brand logos) and belongingness (e.g., helping behavior, charitable donation likelihood and amount) compensation, we acknowledge that the individual studies included exhibit variations.

We recognize that presenting an internal meta-analysis that incorporates less successful studies may raise concerns for some readers. However, in today's research landscape, where concerns about replication and the robustness of findings are prevalent (Baker, 2016; Cesario, 2014), we want to stress the importance of embracing a more transparent and inclusive approach. By presenting an internal meta-analysis that encompasses both successful and less successful

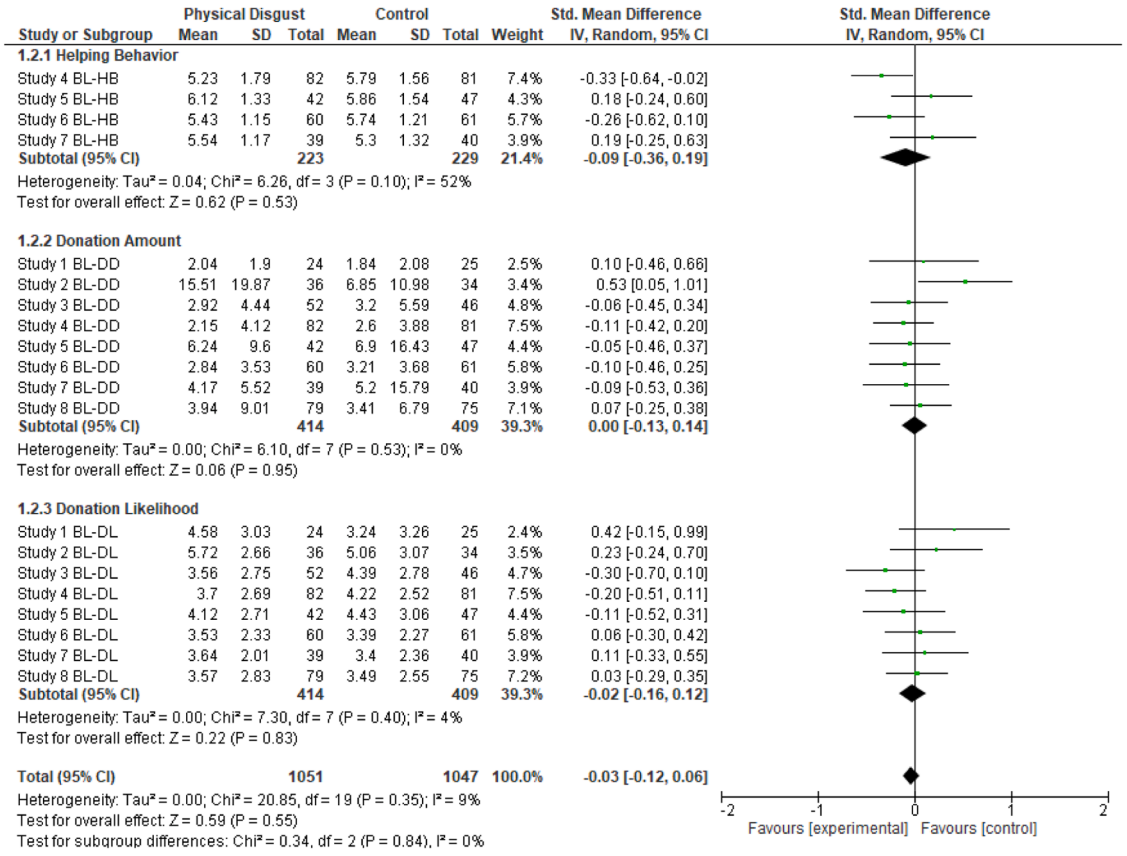

Fig. 7. Forest plot of comparisons between the physical disgust and control conditions for individual operationalizations of belongingness threat compensation.
Note. Dependent Variables: DV BL = belongingness compensation; BL – DD = charitable donation dollar amount; BL – DL = charitable donation likelihood; BL – HB = likelihood to help others.

experiments, we aim to contribute to shifting the narrative around failed experiments. Rather than viewing them solely as setbacks, these findings can indeed hold immense value, offering critical insights that pave the way for improved subsequent designs and a deeper understanding of the phenomena under investigation. Our approach underscores the notion that aggregate effects, as revealed through meta-analysis, can provide a holistic perspective on the overarching trends in our field, showcasing the significance of considering the entire research process, from initial experimentation to refinement.

4.1. Theoretical contributions

This research makes several theoretical contributions. First, it adds to research in consumer behavior by distinguishing between physical and moral disgust elicitors. Although psychology research highlighted this distinction long ago, consumer behavior researchers have not explicitly accounted for it in studies examining the effects of disgust in consumption settings (Argo et al., 2006; Morales et al., 2012; Morales and Fitzsimons, 2007). Furthermore, we show that this distinction is fundamental and should be taken into consideration when researching the effects of shockvertising on consumers' reaction. Previous research on shockvertising (Bushman and Lull, 2015; Dahl et al., 2003) failed to account for the different emotional elicitors used and often resorted to classification of stimuli as shocking or violent without accounting for the specific emotional content. We provided various real-world examples (Fig. 1 and Web Appendix A) to show that shocking advertisements use physical and moral disgust elicitors indiscriminately, and we provided empirical evidence that this difference matters.

Second, we explored the behavioral consequences of using shocking images per se and beyond message compliance. By building our theorizing on the appraisal theory framework of emotions and on compensatory consumption theory, we were able to examine nonconscious behavioral reactions to physically or morally disgusting images. In particular, we proposed and tested that moral and physical disgust elicit compensatory consumption behaviors that are consistent with self-threats in the power and belongingness domain. We believe that this is an important first step in the examination of how situational appraisals can be shaped by emotional experiences and signal danger to the sense of self.

4.2. Societal implications

Commonly, marketers employ strong images to scare consumers into paying attention to societal issues or to break through the advertising clutter; this research provides new insights into the specific subconscious consequences such images entail. Our research would suggest that marketers should carefully choose the emotional content of their shockvertising attempts. As we mention in the introduction, images that have elements of physical or moral disgust are used in different contexts and to convey a variety of different messages (see Web Appendix A). Our research shows that if prosocial behavioral responses are sought (e.g., money donation, recycling), such images should focus on eliciting feelings of moral disgust. However, if more self-focused responses are sought (e.g., conspicuous consumption, aggressiveness), physically disgusting stimuli should be preferred. That said, we are not advocating for a disproportionate usage of disgusting images in advertising, because there might be other effects that are not studied within the present research. Our investigation focused on understanding nonconscious behavioral reactions to physically and morally disgusting images, but left unexplored the issue of whether the use of these stimuli might be

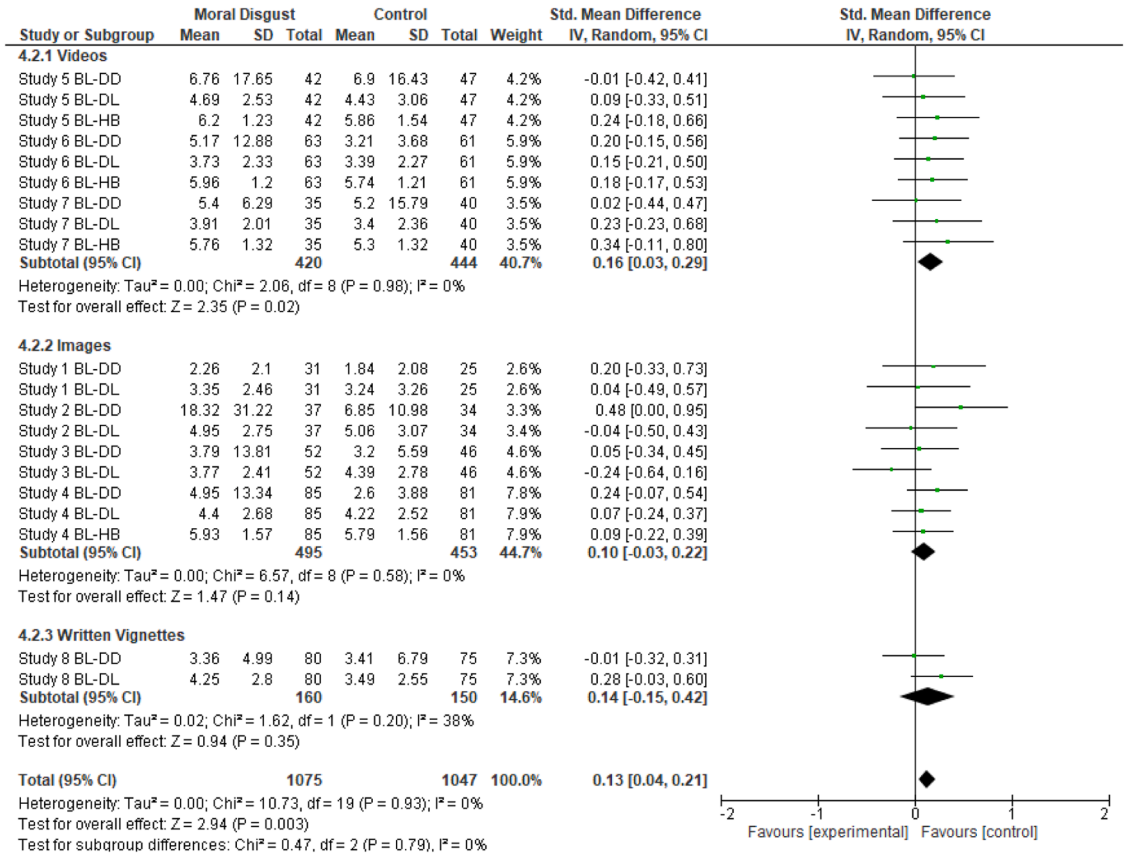

Fig. 8. Forest plot of comparisons between the moral disgust and control conditions for individual operationalizations of the independent variable.
Note. Independent variable: emotion elicitation with videos, images or written vignettes.

detrimental to brand image (Andersson et al., 2004; Parry et al., 2013) or to the processing of the message itself (Callister et al., 2022; Dahl et al., 2003; Huhmann and Mott-Stenerson, 2008; Lee et al., 2020).

4.3. Limitations and further research

While our meta-analysis provides valuable insights into the compensatory consumption behavioral tendencies triggered by physical and moral disgust exposures, we acknowledge several limitations that warrant consideration. In particular, we acknowledge the necessity of fostering a more nuanced discussion concerning the implications of our findings, particularly in light of the small effect sizes we observed. The literature on threat compensation effects, including consumer behavior and social psychology research, frequently exhibits a pronounced sensitivity to contextual and individual differences factors. As exemplified by numerous academic debates, certain situational elements may amplify or attenuate the observed effects (Cesario, 2014; Otterbring et al., 2020; Stoebe, 2016; Van Bavel et al., 2016). Future research could investigate contextual factors and individual differences that may moderate the observed effects and that are not comprehensively examined within the scope of work. Besides underscoring the contextual nature of these effects, it is also important to discuss and recognize that even effect sizes deemed small by conventional standards can carry significant societal or managerial relevance if they prove to be robust and scalable (Funder and Ozer, 2019; Götz et al., 2022; Otterbring and Folwarczny, 2022). Contextual variations are aligned with the significance of our meta-analytic approach, and embracing the value of small effects can contribute to establishing a more reliable and reproducible cumulative psychological science, as we outlined in our earlier discussion.

Another noteworthy limitation is the observed low reliability coefficients for conspicuous consumption indices related to willingness to pay, a phenomenon also noted in previous research (e.g., Otterbring et al., 2018; Wang and Griskevicius, 2014). In a single-study context, low reliability in specific measures can pose challenges to interpretation. However, our meta-analytical approach overcomes this limitation to a significant extent. By aggregating a diverse set of studies with varying operationalizations of compensatory behaviors, we mitigate the potential impact of low reliability in any single measure.

Moreover, although this research makes a significant contribution in showing that exposure to emotional content in advertising prompts nonconscious compensatory behavior responses, we did not test for the underlying process directly. In future studies, researchers might want to test the underlying process by either measuring or manipulating the hypothesized self-threats (power, belongingness). If bolstering the sense of power or of belongingness eliminates the effect that we found with our meta-analysis, we can provide additional evidence that our conceptual framework holds true.

Finally, in an effort to maximize internal validity, we did not use disgusting stimuli that were embedded in a specific advertising message. However, future studies should investigate the moderating effect of advertising message content (e.g., environmental consciousness, social injustice, consumer product) on the response that either physical or moral disgust (or other emotions with different appraisal tendencies) elicits on viewers' subsequent nonconscious behaviors. Our is a first step in investigating how the human-made environment containing

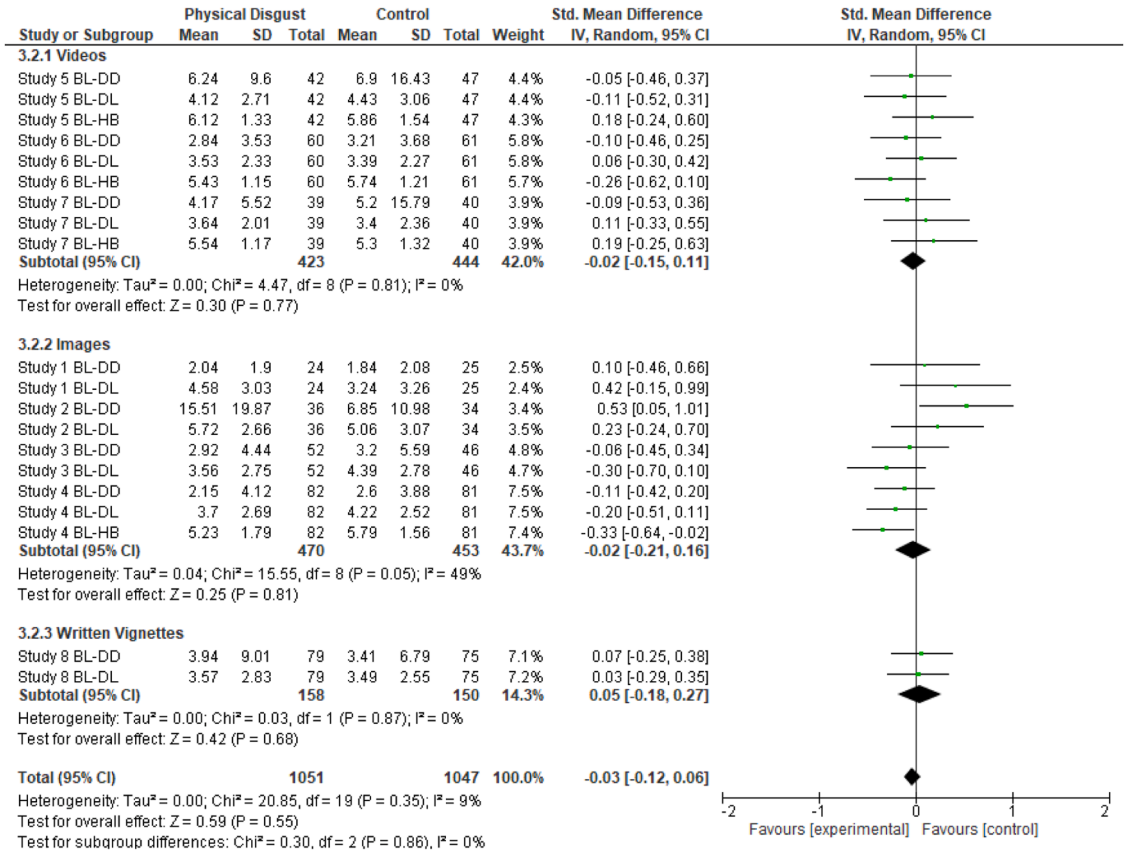

Fig. 9. Forest plot of comparisons between the physical disgust and control conditions for individual operationalizations of the independent variable.
Note. Independent variable: emotion elicitation with videos, images or written vignettes.

purposefully shocking images interacts with emotional responses in affecting individual behavior, and we hope our findings will spark more research on the topic, especially given the rise of ethical consumerism and of concern for the environment and societal well-being.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Ethics & Informed Consent Statement

Informed consent was obtained from all participants at the beginning of the survey. Prior to their participation, participants were presented with a detailed explanation of the study's purpose, procedures, potential risks and benefits, confidentiality measures, and their rights as participants. They were also informed that their participation was voluntary and that they could withdraw from the study at any time without any negative consequences. Participants were required to indicate their understanding of this information and provide their explicit consent before proceeding with the survey.

Acknowledgments

This research was supported by research grants from the HEC Foundation of HEC Paris and Investissements d'Avenir (ANR-11-IDEX-0003/Labex Ecodec/ANR-11-LABX-0047) awarded to the second author.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.cresp.2023.100172.

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