

**Connected With an Inherently Human Whole? The relationship between awe,
dehumanization, and ego dissolution**

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Abstract

Dehumanization of social outgroups has traditionally been a topic of socio-political concern, given its variety of consequences ranging from a lack of help to blatant harm and violence. Whereas several contact-based interventions have been proposed before, the current study isolates the experience of awe as potentially reducing dehumanization. With 263 undergraduate students, a model was tested in which awe reduces the subtle dehumanization of homeless alcoholics. An increased sense of ego dissolution was positioned as a partial mediator of the inverse causal relationship. Participants watched brief movie clips that induced awe, general positive affect, or neutral affect. Neither the main effect nor the mediation model are supported by the data. Findings are tentatively discussed in light of the hypothesis that awe reduces blatant, but not subtle dehumanization. Exploratory analyses further imply that particular social and moral emotions may reduce dehumanization. A theoretical framework is then outlined which suggests how future work can extend the current research in order to specify the existence, form, and mechanisms of a causal effect of awe, and other emotions, on dehumanization.

Keywords: awe, dehumanization, ego dissolution, self-transcendence, social outgroups

Connected With an Inherently Human Whole? The relationship between awe, dehumanization, and ego dissolution

Dehumanization of social outgroups has been a topic of empirical conceptualization and investigation (see, for example, Haslam, 2006; Vaes et al., 2020) as much as of socio-political concern, given its variety of consequences ranging from a lack of help toward disadvantaged groups (Andrighetto et al., 2014; Tausen et al., 2023) to blatant harm and violence (Kteily et al., 2015; Landry et al., 2022; Rousseau et al., 2023). Although dehumanization is commonly regarded as a distinct, everyday social-cognitive phenomenon (Haslam, 2006), yet often embedded in intergroup contexts (Haslam & Loughnan, 2014), little is known about what affects it causally. The current study examines whether the experience of awe reduces dehumanization and a potential mediating role of ego dissolution.

Subtle dehumanization

Dehumanization refers to the denial of humanness to others (Haslam, 2006). *Blatant* dehumanization is an overt and often aggressive form that involves explicitly thinking of others as animals (Kteily et al., 2015). In contrast, *subtle* dehumanization involves implicit beliefs on to what extent others share typically human traits (Haslam & Loughnan, 2014). As an everyday phenomenon, subtle dehumanization is rooted in ordinary social-cognitive processes of *perceiving* a lack of full humanness in others (Vaes et al., 2020). Although a matter of degree, failing to attribute humanness to others involves a distinct failure of recognizing the moral relevance of their human subjectivity (de Ruiter, 2022). That is, whereas Vaes et al. (2020) regard dehumanization as a purely cognitive phenomenon related to yet distinct from moral evaluation, de Ruiter (2022) argues that dehumanization entails a normative dimension of moral exclusion that lays the foundation for potential neglect and harm (see also Mikkola, 2016). Overcoming dehumanization could therefore require *reevaluating* the moral relevance of a target on top of *reattributing* humanness to them.

Dehumanization can be further differentiated according to Gray et al.'s (2007) distinct dimensions of mind perception: On the one hand, *mechanistic dehumanization* involves denial of traits central to human nature (HN) such as depth, warmth, and experience (Haslam, 2006). Likening human beings to machines implies a sense of fundamental dissimilarity and therefore elicits moral exclusion and feelings of indifference, essentially perceiving outgroups as nonhumans not worthy of moral consideration and protection from harm (Haslam & Loughnan, 2014). On the other hand, *animalistic dehumanization* involves denial of human uniqueness (HU) traits such as logic, self-control, and competence (Haslam, 2006). Likening human beings to animals implies a downward comparison and therefore elicits moral degradation, contempt and disgust, essentially perceiving outgroups as subhumans perceived to be dangerous as deficient in moral agency (Haslam & Loughnan, 2014). Note that animalistic dehumanization involves an explicit denial of moral equity to another whereas mechanistic dehumanization relies on a complete dismissal of morally considering targets at all. In consequence, mechanistic forms of dehumanization often go along with a lack of help and protection whereas animalistic forms can potentially elicit overt harm and violence.

Dehumanization is often, yet not necessarily, directed towards social outgroups (Haslam, 2006; Haslam & Loughnan, 2014). Subtle perceptual biases that depersonalize outgroups (Tajfel, 1981) and picture ingroups as more human (Haslam et al., 2005; Leyens et al., 2001) may explain this group-level tendency. According to the Stereotype Content Model (Fiske et al., 2002), group stereotypes vary in terms of perceived warmth and competence. 'Low-low' outgroups perceived to lack both characteristics, such as homeless alcoholics, fail to engage a putative *social cognition network* in the brain and therefore fail to be attributed mental states spontaneously (Harris & Fiske, 2006, 2011). The failure of recognition inherent in dehumanization may therefore be rooted in a failure of neural activation. Note that Fiske et al.'s (2002) distinction between perceived warmth and competence reflects a distinction

between a human nature and a human uniqueness trait. Indeed, homeless alcoholics as a prototypical ‘low-low’ outgroup are shown to be doubly dehumanized in mechanistic and animalistic forms (Tausen et al., 2023).

Dehumanized outgroups face many negative consequences, including decreased prosociality, increased antisociality and diminished moral worth (Haslam & Loughnan, 2014). On the one hand, diminished empathy towards dehumanized groups leads to the omission of helping behaviors (Haslam & Loughnan, 2014). On the other hand, the revulsion felt towards animalized outgroups predicts retaliatory aggression and support for punitive treatments (Haslam & Loughnan, 2014). To illustrate, dehumanizing perceptions are associated with increased endorsement of torture of Muslim prisoners of war among British Christians (Viki et al., 2013) and of forced population transfers of Palestinians among Israelis (Maoz & McCauley, 2008), and disgust felt towards outgroups violating human rights norms raises Americans’ support for human rights violations against those outgroups (Rousseau et al., 2023). Note, however, that dehumanization need not exert primary influence on intergroup behaviors across contexts (see Tausen et al., 2023, for an example). Note further that dehumanization is a pervasive phenomenon in healthcare with potentially functional effects in decision-making, yet overall detrimental to patient agency, treatment and health (see Haque & Waytz, 2012, for more information).

Despite its variety of causes, deeply ingrained in social cognitive and identity processes (Haslam & Loughnan, 2014), several interventions have been proposed to reduce dehumanization. Most popularly, intergroup contact is suggested to reduce anxiety, promote perceived similarity and create a sense of shared identity — in forms of both direct exposure and media-based *parasocial contact* (Kteily & Landry, 2022; Prati et al., 2023). For example, Landry et al. (2024) developed videos of Russian soldiers expressing moral agency and remorse about the invasion of Ukraine whereas Gallardo et al. (2023) portrayed young

Muslims ridiculing Islamophobic comments on social media. While both interventions effectively reduced the dehumanization of target groups, Tausen et al. (2021) demonstrated that a tent city hosted by college students has limited impact on perceptions of the homeless. Other supportive strategies have been suggested, namely individuating a target by highlighting their multiple identities and providing counterstereotypic examples of outgroup members (Kteily & Landry, 2022; Prati et al., 2023). Note, however, that the perception of homeless alcoholics may be less responsive to such strategies as their status as an extreme social outgroup, and its associated characteristics, likely remains salient across contexts. Note further that dehumanization is embedded in and reinforced by ideological, social and institutional contexts (Maynard & Luft, 2023). Whereas that cultural embeddedness constrains the impact of intergroup interventions, the present research takes a broad, novel approach by isolating the experience of awe as potentially reducing dehumanization.

The experience of awe

Wide and steep mountains, canyons and waterfalls, great artworks and extraordinary acts of virtue: *Awe* has been defined as a feeling of intense wonder experienced in the face of something so vast that it triggers a *need for cognitive accommodation* (Keltner & Haidt, 2003). Its profound impact can be triggered by a wide variety of human-made, social, spiritual and artistic stimuli (Schaffer et al., 2023), but often involves a component of nature, such as viewing the Earth from space (Yaden et al., 2016). As an epistemic emotion, awe triggers a range of psychological processes that act upon social cognitive schemata. It engages (a) a sense of small self, perceiving a diminished self-size in response to vastness (Piff et al., 2015), (b) self-diminishment, a decrease of focus on one's own and increase of focus on others' needs and welfare (Chirico & Yaden, 2018), and (c) a reflective processing style, a tendency to override reflexive judgments by careful, conscious deliberation in response to enhanced uncertainty caused by experiences incongruent with current mental schemata (Lucht & van

Schie, 2024). Broadly, one acquires a “sense of membership in a greater whole with less focus on the self” (Schaffer et al., 2023, p. 17).

Awe and dehumanization

Theoretically, awe experiences carry potential to reduce dehumanization as a result of interacting attentional, metacognitive and affective shifts. First, a sense of small self and self-diminishment shift attention away from the self towards others (Schaffer et al., 2023). Second, a reflective processing style may be necessary to overcome dehumanizing perceptions: Deliberate, effortful thinking is required to reevaluate the heuristic judgment that initially dehumanized targets (Lucht & van Schie, 2024; see also Dual Process Theory in de Neys, 2017). That process of recategorization is supported by increased intellectual humility (Krumrei-Mancuso et al., 2023). Accompanied by an increased focus on others, the willingness to adjust current mental schemata could thus suffice to override prior perceptions of social outgroups. Third, increased connectedness (Schaffer et al., 2023) and feelings of oneness with others (Van Cappellen & Saroglou, 2012) in response to awe may trigger a sense of common humanity. In cognitive terms, attentional and affective shifts could effect a move from ‘I am only a small, insignificant human being’ to ‘We are all only small, insignificant human beings’. Indeed, Wu et al. (2023) exemplify the interactions of processes involved in reducing dehumanization by showing that, via a perceived small self and an increased need for relatedness, awe induces ‘wise reasoning’ in adolescents — an intellectually humble form of reasoning from a broad perspective that acknowledges uncertainty and integrates discrepancies.

A number of empirical studies provide more direct support to the mechanisms by which awe potentially reduces dehumanization. Song et al. (2023) demonstrate that awe, in dispositional, video-induced and Virtual Reality induced forms, expands feelings of connectedness and hence the breadth of ethically considered entities to more distant targets,

such as stigmatized people, outgroups, and animals, via the perceived small self. Although not necessarily paralleled by an attribution of humanness, moral expansiveness has the potential to reduce mechanistic dehumanization of outgroups by reevaluating their moral relevance. In contrast, Lv et al. (2023) provide the very first experimental test of an inverse causal relationship: Awe moderately reduces the blatant dehumanization of Chinese people with obesity. As different conditions (awe, pride, happiness, neutral affect) were compared using varied experimental manipulations (watching videos vs. imaging scenarios) across studies, causal inference appears strong. As expected, nature-related and alternative forms of awe induction (i.e., the growth of an infant in the womb and its birth) were found to exert the same mitigating effect on dehumanization. While assumed to be facilitated by attentional and metacognitive shifts, the effect of awe on blatant dehumanization is mediated by a common ingroup identity, proposed to eliminate prior negative intergroup attitudes. Yet, the investigated manner and target of dehumanization limits applicability to the current case. This study sets out to extend these findings by examining the effect of awe, as compared to humor, on the subtle dehumanization of homeless alcoholics.

The mediating role of ego dissolution

Ego dissolution describes a phenomenon of altered self-awareness in which a compromised or lost sense of self elicits a feeling of unity with the world, perceived as a coherent whole (Nour et al., 2016). Even though the narrow meaning of ‘self’ and ‘ego’ remain contested in the literature, ego dissolution broadly refers to a perceived lack of a distinct first-person, bodily or narrative self (Lynn et al., 2023) that reflect the underlying experience of basic self-awareness rooted in multimodal integration (Millière, 2017). Yaden et al. (2017) distinguish ‘annihilational’ and ‘relational’ dimensions of the self-transcendent experience that manifest as separate components of ego dissolution: Described as the experience of “being no one, being one” (Kałużna et al., 2022, p. 1), it involves (a) an ‘ego

loss' that reflects a complete absence of the sense of self and its boundaries and (b) a strong sense of unity that involves both decreased self-salience and increased connectedness with others and the universe itself (Lynn et al., 2023). As a multidimensional family of related states that includes everyday variations of subtle, transient and potentially awe-induced nature (Lynn et al., 2023), ego dissolution is conceptualized as varying in its intensity by degree and hence measurable in a quantitative sense.

I hypothesize that ego dissolution *partially* mediates the inverse awe-dehumanization relation: Firstly, awe triggers ego dissolution via the small self in response to vastness, yet to a limited extent. Indeed, awe and ego dissolution represent related yet distinct states: Both exert a profound, self-transcendent impact that involves self-diminishment (Chen & Mongrain, 2021; Hendricks, 2018) and feelings of connectedness with others (Kałużna et al., 2022; van Mulukom et al., 2020). Yet, ego dissolution represents a form of the awe-typical small self so extreme that self-referential awareness is completely eliminated (Hendricks, 2018). Consistent with Luo et al.'s (2021, p. 60) argument that "awe helps individuals to view themselves and the world in a manner unhindered by the boundaries of ego identity", the broader sense of vastness inherent in awe is then perceived as pure self-other unity (Nour et al., 2016; Yaden et al., 2017). By dissolving boundaries between the self, others, and the universe, awe can particularly enhance components of decreased self-importance and increased feelings of connectedness. Note that these causal processes align with Song et al.'s (2023) findings that a small self in response to vastness expands both connectedness and moral concern. In turn, a strong sense of unity may reduce dehumanization by effecting (a) a recategorization of self and other in terms of common humanity and (b) a reevaluation of a target's moral worth as a result of perceived oneness. Yet lacking awe-typical metacognitive changes in processing style, ego dissolution is positioned as a partial mediator of the relationship between awe and dehumanization.

The current study

Although initial evidence points to a mitigating effect of awe on dehumanization, little is yet known about the strength of this finding and its potential underlying mechanisms. The current study tested a causal model in which awe induction reduces the subtle dehumanization of homeless alcoholics, an effect presumably mediated by ego dissolution. In order to isolate effects of awe from general positive emotion, the study includes a humorous and a neutral control condition. The following hypotheses are tested:

H1: Awe induction reduces subtle dehumanization of homeless alcoholics, as compared to humor and neutral affect.

H2: The inverse relationship between awe and dehumanization is partially mediated by ego dissolution such that an awe-induced increase in ego dissolution reduces dehumanization.

The entire study was preregistered on the As Predicted Website (https://aspredicted.org/CQC_9WK).

Methods

Participants

A total of 307 undergraduate students from the Faculty of Economics and Business, University of Groningen, The Netherlands, was recruited for participation. Exclusion criteria comprised (a) failure of the attention check ($n = 32$); (b) self-reported nonseriousness during completion of the study ($n = 1$); (c) insufficient language skills (operationalized as responses of 1 = *not at all* on a self-report scale assessing English fluency, ranging from 1 = *not at all* to 5 = *completely fluent*, $n = 4$); and (d) failed experimental manipulation, that is, absent, inattentive or incomprehensive description of the movie clip just after watching it ($n = 7$). Two-hundred sixty three participants were included in the final data set (185 males, 78 females, $M_{age} = 19.5$, $SD = 2.1$). Most participants were Dutch ($n = 206$), a minority German

($n = 12$) and of another nationality ($n = 45$). Nine participants were English native speakers, other native languages correspond to nationalities. None of the named characteristics differed significantly across experimental groups. With $N = 263$ and $\alpha = .05$, the study had a power of .34 to detect a small effect of $d = 0.2$, a power of .97 to detect a medium effect of $d = 0.5$, and a power of .99 to detect a large effect of $d = 0.8$.

Research design and procedure

In a between-participants experiment, participants were randomly assigned to three conditions: an awe group (treatment, $n = 89$), a humor group (control: positive emotion, $n = 80$), a woodworking group (control: neutral, $n = 94$). Those correspond to experimental manipulations based on previous studies that use videos of nature as awe inductions, contrasted with procedural instructions as neutral control and amusement as general positive emotion (e.g., Edwards et al., 2023; Naclerio & Van Cappellen, 2021; Prade & Saroglou, 2016; Zhu et al., 2021). Participants were instructed to watch brief movie clips of five minutes, including the awe condition, which depicted a journey through space with view on the Earth (see the *overview effect*; Yaden et al., 2016); the humor condition, which depicted a young, inexperienced alien repeatedly failing to kidnap a human being; and the control condition, which depicted an Australian man giving instructions on how to construct a wooden fence (see Appendix A). After completing measures for dehumanization and ego dissolution, participants had to briefly describe the content of the movie clip (attention check) and their thoughts and feelings while watching (supplementary information). Students were rewarded for participation with course credits. All materials presented were in English. The experiment included other measures irrelevant to the current study, presented after the ones described here. Taking these into account, the experiment had an approximate duration of 30 minutes.

Measures

Manipulation checks

Manipulation checks were performed to assess the effect of the movie clips in terms of positive and negative affect, the intensity of awe and need for accommodation. Statements such as “The video was powerful and awe inspiring” were evaluated on a 5-point scale from 1 = *not at all* to 5 = *very much*. Whereas positive and negative affect comprised only one item each, awe and need for accommodation were assessed as averaged scores of the corresponding two items each. Both demonstrated moderate to high internal consistency, with $\alpha = 0.85$ for awe and $\alpha = 0.69$ for need for accommodation (see Appendix A for a complete list of items).

Subtle dehumanization

Adapted from Bastian & Haslam (2010), eight items were designed to assess subtle dehumanization. Introduced to a picture of homeless alcoholics, participants indicated their agreement to statements referring to either human nature (friendly, warm, superficial, mechanical) or human uniqueness (polite, intelligent, savage, primitive) traits in a Likert format, ranging from 1 = *strongly disagree* to 7 = *strongly agree* (e.g., “I feel like homeless alcoholics are friendly”; see Appendix A). Reversed scoring was applied to positive trait items and all items were added up to a total score, with higher scores indicating stronger dehumanization. For exploratory purposes, separate scores for both human nature traits, representing mechanistic dehumanization, and human uniqueness traits, representing animalistic dehumanization, were calculated by averaging the scores on all corresponding items. In this sample, overall internal consistency of the measure was found to be good ($\alpha = 0.77$).

Ego dissolution

Developed by Nour et al. (2016), the Ego-Dissolution Inventory (EDI) was used to assess ego dissolution. The EDI is an eight-item self-report scale that incorporates the various dimensions of ego dissolution (see Yaden et al., 2017). On a scale from 1 = *no, not more than usual* to 5 = *very much*, participants had to indicate their perceived levels of ego dissolution during the experimental manipulation relative to their common experiences (e.g., “During the video, I experienced a dissolution of my ‘self’ or ego”; see Appendix A). The items incorporate both terms ‘self’ and ‘ego’ for the sake of comprehensibility. All items were added up to a total score. For exploratory purposes, separate scores were calculated for both dimensions, ego loss and unity, by averaging the scores on all corresponding items. The excellent internal consistency found by Nour et al. (2016; $\alpha = 0.93$) could be replicated in this sample ($\alpha = 0.87$).

Results

Manipulation checks

In order to assess the match of intended and actual effects of the movie clips across experimental groups, manipulation checks were performed by means of Welch’s¹ univariate Analysis of Variance (ANOVA). Significant main effects were found in all four categories: awe, $F(2, 172) = 43.66, p < .001, \omega^2 = .26$; need for accommodation, $F(2, 172) = 6.49, p = .002, \omega^2 = .04$; positive affect, $F(2, 167) = 6.47, p = .002, \omega^2 = .04$; negative affect, $F(2, 165) = 7.21, p < .001, \omega^2 = .04$. As seen in Table 1, viewing the Earth from space elicited far stronger awe than watching either the amusing alien or the woodwork instructions. Similarly, the awe group reported the highest levels of need for accommodation as compared to the

¹ Within a total range of $.7 < SD < 1.2$, Levene’s Test for Homogeneity of Variances shows that group variances are partly unequal, with $F(2, 260) = .84, p = .9$ for awe; $F(2, 260) = .11, p = .432$ for need for accommodation; $F(2, 260) = 4.07, p = .018$ for positive affect; $F(2, 260) = 9.79, p < .001$ for negative affect.

humor and woodworking groups. Yet, the woodworking group reported the significantly strongest positive and weakest negative affect while watching the movie clip.

Table 1

Descriptives for manipulation checks across experimental groups

Group	Awe	Humor	Woodworking
Positive Affect	3.33 (1.05) ^b	3.35 (1.05) ^b	3.77 (.85) ^a
Negative Affect	2.0 (1.19) ^a	1.81 (.93) ^a	1.48 (.77) ^b
Awe	3.64 (1.1) ^a	2.17 (.97) ^c	2.63 (1.0) ^b
Need for Accommodation	2.44 (1.02) ^a	1.91 (1.01) ^b	2.02 (1.02) ^b

Note. Post-hoc tests were performed in order to determine statistically significant group differences.²

^{a, b, c} These superscripts indicate statistically significant group differences.

Dehumanization of homeless alcoholics

This study hypothesized that the awe group dehumanizes homeless alcoholics less than the control, the humor and woodworking groups. By performing Fischer's univariate ANOVA,³ no support for that hypothesis could be found: The analysis remained statistically insignificant, with $F(2, 260) = 1.28, p = .279, \omega^2 = .002$. Same goes for separate analysis of each form of dehumanization, with $F(2, 260) = 2.79, p = .063, \omega^2 = .01$ for mechanistic and

Table 2

Descriptives for total score of dehumanization across experimental groups

Group	Awe	Humor	Woodworking
Mechanistic	4.13 (1.05)	4.12 (1.06)	3.82 (.96)

² Given that Levene's Test for Homogeneity of Variances is significant only for Positive Affect and Negative Affect, Games-Howell Tests, assuming unequal variances, were performed for those categories whereas Tukey Tests, assuming equal variances, were performed for Awe and Need for Accommodation.

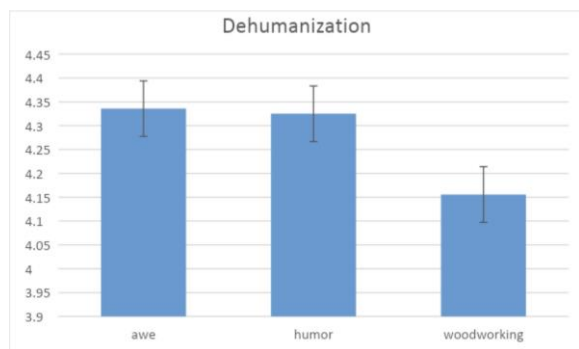
³ With experimental condition as predictor and the total score of dehumanization, on a 7-point scale, as dependent variable. Given that Levene's Test for Homogeneity of Variances was not statistically significant, with $F(2, 260) = .95, p = .389$, and group standard deviations appear roughly equal, with $SD_{awe} = .86, SD_{humor} = .9, SD_{woodworking} = .8$, equal variances could be assumed. Note, though, the presence of opposing outliers in the awe group with $M = 7$ and $M = 2.125$. Further, a univariate ANOVA was performed despite a statistically significant Shapiro-Wilk Test for Normality, with $W = .99, p = .035$, due to its robustness against such violation and only mild skewness assessed in a Q-Q plot.

Animalistic	4.54 (.85)	4.53 (.92)	4.49 (.88)
Total	4.34 (.86)	4.33 (.9)	4.16 (.8)

Note. No significant group differences were found.

Figure 1

Mean levels of dehumanization across experimental groups with standard errors



$F(2, 260) = .06, p = .937, \omega^2 = .007$ for animalistic dehumanization. Note that all groups display moderate levels of dehumanization, on average expressing slight agreement with dehumanizing trait descriptions of homeless alcoholics ($3.8 < Ms < 4.6$; see Table 2). Albeit insignificantly, the neutral control condition displayed the lowest levels of dehumanization (see Figure 1). This particularly applies to mechanistic forms of dehumanization. These findings clearly contradict the hypothesis.

Mediation analysis

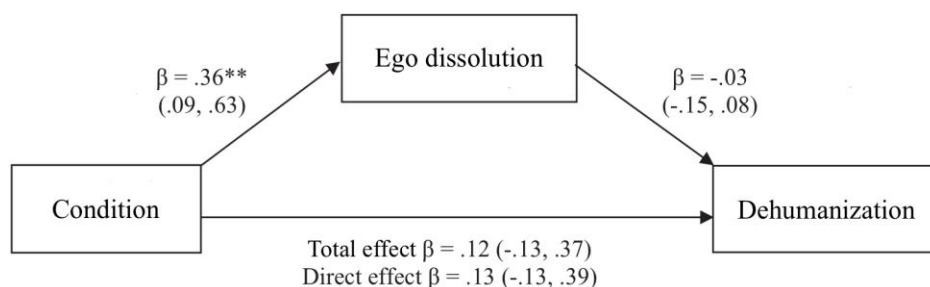
Although a significant main effect is commonly considered a necessary condition for a mediation analysis (Baron & Kenny, 1986), examining the role of ego dissolution amidst awe and dehumanization can yet be of theoretical value. Consider the initial hypothesis that assigns ego dissolution a partially mediating role such that awe increases ego dissolution, which reduces dehumanization. In fact, the overall mediation model remained insignificant due to an absence of effects of ego dissolution on dehumanization. Specifically, a complete mediation analysis⁴ yielded an insignificant overall indirect effect ($\beta = -.01, Z = -.54, p =$

⁴ With condition (awe vs. control) as predictor, ego dissolution as mediator and dehumanization as dependent variable. Given the mediation model, woodworking and humor groups were synthesized into a single control condition for this analysis.

.592) with 95% confidence interval from -.06 to .03, indicating that ego dissolution does not partially mediate the relationship between awe and dehumanization. Yet, as to the first path

Figure 2

Mediation model of indirect effect of awe on dehumanization through ego dissolution



Note. Coefficients represent standardized coefficients, with 95% confidence intervals noted in parentheses.

** $p < .01$.

implied in this indirect effect, awe was indeed found to elicit significantly higher levels of ego dissolution (see Figure 2).⁵ Overall, this study could not find any support for the proposed causal model of awe, dehumanization, and ego dissolution.

Discussion

This study examined a potential causal effect of awe on the subtle dehumanization of homeless alcoholics. An increased sense of ego dissolution was positioned as a partial mediator of the inverse causal relationship, reducing dehumanization particularly through perceived unity with other human beings (Yaden et al., 2017). Brief movie clips were used to induce a state of awe, contrasted with humor and a neutral control. Indeed, the core manipulation worked as intended: The awe condition reported a strong sense of awe, both in an absolute and relative sense. Yet, the proposed main effect is not supported by the results. In

Standardized estimates were used for both measures. The analysis is based on bias-corrected bootstrap estimates of 10,000 bootstrap samples. The JAMOVI mediation analysis, adapted from the PROCESS macro (Hayes, 2013), was used.

⁵ On an exploratory note, a non-parametric, univariate Kruskal-Wallis ANOVA was performed, given strong violations of both assumptions of Normality and homoscedasticity, that yielded significant results ($\chi^2(1) = 5.32, p = .021, \epsilon^2 = .02$). The analysis remained significant when separating both dimensions of ego dissolution, with $\chi^2(1) = 4.59, p = .032, \epsilon^2 = .02$ for ego loss and $\chi^2(1) = 5.99, p = .014, \epsilon^2 = .02$ for unity.

contrast, the control condition demonstrated the lowest levels of dehumanization, up to almost significant levels for the subscale of mechanistic dehumanization. These findings clearly contradict Hypothesis 1. Theoretically, the absence of an effect presupposes that the proposed attentional, metacognitive and affective shifts are either not sufficient to reduce subtle dehumanization, or are not reliably elicited by the current awe induction. Indeed, a faulty study design may explain the failure to detect a true effect: Even though the awe condition reported the significantly strongest need for accommodation in response to the movie clip, both its absolute levels and its effect size remain moderate. The metacognitive shift may have hence not been strong enough to induce a reflective processing style necessary to overcome initial dehumanizing perceptions. At the same time, it remains possible that awe simply does not affect dehumanization.

However, the current findings also oppose prior research that documents an inverted causal relation between awe and the blatant dehumanization of Chinese people with obesity, controlling for general positive emotion. In particular, Lv et al. (2023) demonstrated moderate to high effect sizes (Cohen's $d_s > 0.5$) across various forms of awe induction. This finding challenges the failure of the current study to establish an effect on dehumanization despite high effect sizes ($d_s > 1.0$) of the awe manipulation using the overview effect, known for its intense feelings of identification with humanity (Yaden et al., 2016). Yet, it remains likely that Lv et al. (2023) found a significant effect because they examined a different kind of dehumanization. In particular, it may be possible that the dehumanization of less distant outgroups, such as Chinese people with obesity as compared to Chinese people, is more amenable to intervention than that of extreme social outgroups, likely because the process of reframing identity in shared terms is facilitated. Above all, however, that study assessed blatant dehumanization, an explicit and external expression of dehumanizing attitudes, measured with the Ascent of Humans scale that depicts five ascending silhouettes to illustrate

evolutionary stages of people from apes to humans. The authors included additional measures that assessed subtle dehumanization via both denial of human nature and human uniqueness traits and demeaning of psychological needs of obese Chinese. Compared to other emotions, awe did not affect any measure of subtle dehumanization. Interestingly, Dale et al. (2020) even find that video-induced awe, with artistic and natural stimuli, increased negative attitudes toward African Americans in response to stereotypic portrayals of that group. As Lv et al. (2023) noted, awe may affect externalizing behaviors rather than internal attitudes. These findings suggest that awe reduces blatant, but not subtle dehumanization. This may be because subtle forms reflect deeply ingrained, private attitudes that are more difficult to change than overt, public expressions of dehumanization.

Further, no support for Hypothesis 2, that the relation between awe and dehumanization would be mediated by ego dissolution, could be found. The current study thus cannot contribute to establishing mediators of the potential awe-dehumanization relation (such as a common ingroup identity; see Lv et al., 2023). Yet, awe experiences indeed cause an increased sense of ego dissolution, a finding that is in line with previous literature that considers awe and ego dissolution varieties of the self-transcendent experience (Yaden et al., 2017). Interestingly, both unity and ego loss as subcategories of ego dissolution are significantly increased. This unexpected finding supports the idea that ego dissolution represents an extreme form of the awe-typical small self (Hendricks, 2018) where the self dwindles as much to effect a weak form of ego loss. Yet, note that both absolute levels of ego dissolution across groups ($1.8 < Ms < 2.3$) and the effect sizes of group differences ($ds < 0.4$) remain low (see Table 3 in Appendix B). Indeed, a strongly right-skewed distribution (see Figure 3 and 4 in Appendix B) suggests that either ego dissolution is an uncommon everyday experience in the sample or all experimental manipulations had only weak effects on it. These

levels may have simply been insufficient to establish an effect of ego dissolution on dehumanization.

On the whole, both self-transcendent phenomena examined, awe and ego dissolution, fail to reduce dehumanization. This implies that a sense of membership in a greater whole extending beyond the self likely does not suffice to change social cognitive representations of outgroups. That line of reasoning is supported in comparison to Song et al.'s (2023) findings that an awe-induced small self in response to vastness expands moral concern: Even though self-transcendent phenomena dissolve perceived boundaries between the self and others, outgroups may continuously be dehumanized. In fact, an expansion of moral concern towards social outgroups does not *necessarily* go along with a social cognitive shift that recategorizes that outgroup as human, or potentially even an ingroup. That idea reflects the assumption that awe-induced metacognitive shifts, untypical to ego dissolution and too weak in the current awe manipulation, are required to reduce dehumanizing perceptions. In sum, both its low observed levels and its potential causal mechanisms could account for the demonstrated lack of effect of ego dissolution on dehumanization.

Strengths and limitations

While particular choices in the study design render possible that a true causal effect remained undetected, the overall valid assessment of all variables suggests that the current study reflects a true lack of effect. Indeed, the current study successfully manipulated the independent variable: The awe condition reported a strong sense of awe, much higher ($d_s > 1.0$) than control groups. It remains noteworthy, however, that participants in the control conditions frequently reported experiences deviating from the target emotions (amusement and boredom, respectively), namely feelings of annoyance, estrangement, and sympathy in the humor condition and warmth, calmness, and admiration in the control condition.⁶ While that

⁶ Supplementary qualitative data on participants' thoughts and feelings while watching the movie clip, collected just after presenting the movie clip, were used for further analysis of the effects of experimental manipulations.

inter-subject variability confounds what general positive emotions are controlled for, it remains theoretically irrelevant as the awe manipulation worked as intended. The fact that manipulation checks and supplementary information were only collected after dependent measures further ensures that their self-reported effects last as long. Yet, the form of experimental manipulation used could have been too weak and transient to observe a true effect: Although brief movie clips represent a previously validated effective strategy of experimental manipulation, video-induced awe may, as Dale et al. (2020) noted, not elicit lasting metacognitive changes strong enough to alter internal attitudes. A laboratory environment may further decrease the impact and duration of awe experiences. Even though participants reported a strong sense of awe, its actual causal effects may be difficult to observe in the current setting.

Similar doubts can be raised about the measurement of the dependent variable. In fact, the current study neither examined baseline levels of dehumanization of homeless alcoholics nor applied a pre-posttest design to infer actual *reductions* of dehumanization. Further, dehumanization scores clustered noticeably around the neutral option of the scale. A seven-point scale that captures subtle dehumanization by agreement to ‘humanness’ trait items may be too indirect and insensitive. Consider that Lv et al. (2023) measured blatant dehumanization with a 100-point slider on the Ascent of Humans scale. Such a highly sensitive measure could be applied on an opposite-end spectrum of ‘humanness’ traits, such as ‘cold-warm’ and ‘superficial-deep’, that assesses subtle dehumanization more directly. As Lv et al. (2023) noted, the measurement of subtle dehumanization may depend on context and method used. For example, ascribing ‘humanness’ traits may differ from ascribing psychological needs to a target, an alternative form to operationalize subtle dehumanization (see Schroeder & Epley, 2020). The nature of different scales questions whether subtle dehumanization in fact represents a coherent underlying construct. Lastly, the large sample

size suggests that a true effect would have been found with the manipulations and measures used (see power calculation in Methods). Yet, considering that a potential effect of awe on the subtle dehumanization of homeless alcoholics is likely significantly smaller than the one found for blatant dehumanization of obese Chinese ($d_s > 0.5$) in Lv et al. (2023), it is possible that a true but marginal effect remained undetected. In contrast, it is more likely that a significant mitigating effect of experiences in the control condition on mechanistic dehumanization could have been found with a more powerful study design.

Theoretical implications

Given the pervasive insignificance of found effects, the current study questions whether awe in fact exerts causal influence on the subtle dehumanization of social outgroups. However, the results obtained also raise the possibility that a different variable could reduce dehumanization. Particularly the fact that the control condition exhibited high positive affect, moderate awe and, almost significantly, the lowest levels of mechanistic dehumanization, supports that line of reasoning. Recall that the experimental manipulation involved watching an Australian man giving instructions on how to construct a wooden fence. While this indeed appears mundane at first, common descriptions of the clip included a calm, happy and peaceful ambiance, created by the voice and attitude of the man and by nature sounds in the background. For example, one participant reported that, after initial boredom, “I was getting more calm and happy, just because of seeing the man doing what he loves. It made me happy that he smiled at the camera, joking with the wooden stick.” Although theoretically assumed to be irrelevant, both the presence of a human being and his attitude, often perceived as warmhearted, may have inadvertently added an independent variable: The positive social emotions, such as perceived warmth and admiration, experienced in response to watching that mellow human being may in fact reduce subtle dehumanization more than awe.

Distinct pathways may explain the mitigating effect of the positive social emotions experienced in the control condition on mechanistic dehumanization. First, perceiving the man in the video as exemplarily warm and friendly could have induced a social cognitive transfer of those attributes onto homeless alcoholics. In fact, Lyshol et al. (2020) show that *kama muta*, a profound social emotion of ‘being moved by love’, reduces dehumanization. Interestingly, the mere process of observing an outgroup exhibiting ‘humanness’ appears a sufficient mechanism to reduce dehumanization of that outgroup by itself, yet reinforced by the emotional experience of *kama muta* perceived interpersonal closeness. While the positive social emotions experienced in the control condition do not qualify as *kama muta*, similar causal dynamics are found in which a failure of recognizing humanness in outgroups can be overcome by transferring observed human nature traits onto that target group. Yet, the control video did not incorporate the target outgroup, homeless alcoholics, but simply an Australian man. This suggests a generalized transfer of *any* human exemplifying human nature traits onto a target outgroup, regardless of whether or not that specific outgroup is observed.

Second, the man could have served as a normative inspiration to show care and compassion for other human beings, including outgroups. Engels et al. (2024) find that *moral elevation*, a positive social emotion experienced when witnessing a human act of virtue, reduces White Americans’ endorsements of animalistic portrayals of commonly dehumanized ethnic outgroups.⁷ In fact, moral elevation could be seen as a particular form of awe experienced in response to exemplary human behavior. Perceived as vast in a normative sense, its incompatibility with current mental schemata on what constitutes normal human behavior induces a need for accommodation. As its self-transcendent nature shifts focus onto

⁷ Note here that moral expansiveness (see Song et al.’s (2023) study in section “Awe and dehumanization”) and moral elevation (see Engels et al., 2024) are distinct phenomena; the former expands the breadth of moral concern on a horizontal scale while the latter intensifies the affectively based depth of moral intentions on a vertical scale. Even though Song et al. (2023) find that awe increases moral expansiveness and Engels et al. (2024) find that moral elevation reduces dehumanization, no inference can thus be made on a causal effect of awe on dehumanization, via engaging moral processes, on the basis of this literature.

a unified whole of self and others, moral elevation increases the depth of moral concern toward any outgroup and hence counteracts the denial of moral equity inherent in animalistic dehumanization. The moderate awe experienced in response to the woodworking video suggests that a (very) weak form of such phenomenon may have co-occurred with other positive social emotions in the control condition. Yet, it reduced mechanistic dehumanization. This logical inconsistency may be explained by the fact that the normative inspiration given by the man increased care for the natural human needs of homeless alcoholics, previously dismissed as ethically irrelevant, and thus effected a reevaluation of their moral relevance. Mitigating effects on dehumanization may in sum be limited to positive, potentially awe-like social emotions experienced in response to human behavior.

On the whole, those processes cast doubt on the assertion that awe itself — *any* awe experience — exerts causal influence on the dehumanization of social outgroups. Yet, taking into account Lv et al.'s (2023) finding that various forms of awe reduce the blatant dehumanization of obese Chinese, further attempts of differentiation could be made: As suggested, general states of awe could affect blatant dehumanization via attentional, metacognitive and affective shifts. In contrast, potentially awe-like social and moral emotions in response to exemplary human behavior may be powerful enough to reduce subtle dehumanization by engaging a direct normative process naturally targeted at other human beings. In essence, if at all, particular forms of awe may affect particular forms of dehumanization through distinct pathways and mechanisms.

Future directions

Future studies should reexamine and extend the current study in different ways. Fundamentally, efforts ought to be directed at establishing whether general states of awe exert causal influence on subtle dehumanization at all. A need to differentiate arises particularly at the intersections of positive social, moral, and awe-like emotions. An in-depth qualitative

analysis of emotions experienced in the control condition represents a starting point from which to discern what particular variables reduce dehumanization and whether they are social, moral or even different in nature. It further remains contested if those emotions can be considered particular forms of awe and, if so, whether their impact on dehumanization necessarily remains limited to those forms triggered by positive human behavior. Of particular methodological interest remains the validity, accuracy and sustainability of experimentally inducing those emotions through brief movie clips.

Efforts to establish boundary conditions of a causal effect could also inform the commensurability of different research lines on dehumanization. In particular, future studies should assess the current implication that blatant, but not subtle, dehumanization is reduced by awe (see Lv et al., 2023). To ensure construct validity, the measurement of subtle dehumanization could include both ‘humanness’ traits (see Bastian & Haslam, 2010) and psychological needs (see Schroeder & Epley, 2020) and explicit and implicit methods (e.g., an Implicit Association Test; see Martínez et al., 2012, for an example). Further, it remains unclear whether a causal effect could easily be generalized across targets, from homeless alcoholics in particular to those extreme social outgroups low on both perceived warmth and competence to *any* outgroup. To illustrate, consider the hypothesis that the dehumanization of less distant outgroups, such as obese Chinese as compared to other Chinese (see Lv et al., 2023), is more amenable to intervention than that of extreme social outgroups. Note that the perception of both social outgroups and what is deemed ‘humanness’ is embedded in a unique cultural context (Maynard & Luft, 2023). For instance, initial evidence points to cross-cultural differences in how, and how much, stigmatized social groups are dehumanized (see Kim et al., 2024). All of these considerations imply that future research examine the generalizability of a causal effect across kinds of dehumanizations and cultural contexts. If applicable, this

further entails pinpointing both baseline levels of dehumanization of particular social groups and specific effect sizes of interventions attempting to reduce dehumanization.

Conclusion

Overall, it remains contested whether awe itself reduces the dehumanization of social outgroups. While this study could not establish any effect of nature-induced awe on the subtle dehumanization of homeless alcoholics, it demonstrates how particular, potentially awe-like social emotions may mitigate mechanistic dehumanization. Though, that preliminary and insignificant finding is yet to be examined in future research. A theoretical framework remains that highlights the need for meticulous conceptual differentiation to isolate effects of general states of awe, particular social and moral emotions on different kinds of dehumanization, blatant and subtle in nature and directed at different targets. Taken together, the current study sets clear guidelines for future research with particular emphasis on carefully assessing the accuracy of experimental manipulations and refining the measurement of dehumanization in order to specify if, and how, awe and other emotions affect dehumanization.

References

- Andrighetto, L., Baldissarri, C., Lattanzio, S., Loughnan, S., & Volpato, C. (2014). Humanitarian aid? Two forms of dehumanization and willingness to help after natural disasters. *British Journal of Social Psychology, 53*(3), 573–584. <https://doi.org/10.1111/bjso.12066>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.
- Bastian, B., & Haslam, N. (2010). Excluded from humanity: The dehumanizing effects of social ostracism. *Journal of Experimental Social Psychology, 46*(1), 107–113. <https://doi.org/10.1016/j.jesp.2009.06.022>
- Chen, S. K., & Mongrain, M. (2021). Awe and the interconnected self. *The Journal of Positive Psychology, 16*(6), 770–778. <https://doi.org/10.1080/17439760.2020.1818808>
- Chirico, A., & Yaden, D. B. (2018). Awe: A self-transcendent and sometimes transformative emotion. In H. C. Lench (Ed.), *The function of emotions: When and why emotions help us* (pp. 221–233). Springer International Publishing/Springer Nature. https://doi.org/10.1007/978-3-319-77619-4_11
- Dale, K. R., Janicke-Bowles, S. H., Raney, A. A., Oliver, M. B., Huse, L. K., Lopez, J., Reed, A., Seibert, J., & Zhao, D. (2020). Awe and Stereotypes: Examining Awe as an Intervention against Stereotypical Media Portrayals of African Americans. *Communication Studies, 71*(4), 699–707. <https://doi.org/10.1080/10510974.2020.1754264>
- de Neys, W. D. (2017). *Dual process theory 2.0*. Routledge.
- de Ruiter, A. (2022). Failing to see what matters most: Towards a better understanding of dehumanisation. *Contemporary Political Theory, 22*(2), 165–186. <https://doi.org/10.1057/s41296-022-00569-2>
- Edwards, M., Helm, P., Pratscher, S. D., Bettencourt, B. A., & Arndt, J. (2023). The Impact of Awe on Existential Isolation: Evidence for Contrasting Pathways. *Personality and Social Psychology Bulletin, 014616722211445*. <https://doi.org/10.1177/01461672221144597>

- Engels, T., Traast, I. J., Doosje, B., Amodio, D. M., & Sauter, D. (2024). Moral elevation mitigates dehumanization of ethnic outgroups. *Current Research in Ecological and Social Psychology*, 6, 100187. <https://doi.org/10.1016/j.cresp.2024.100187>
- Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, 82(6), 878–902.
- Gallardo, R. A., Moore-Berg, S. L., & Hameiri, B. (2024). Exploring Different Psychological Processes in a Media Intervention That Reduces Dehumanization Towards Muslims. *Political Psychology*, 45(1), 43–68. <https://doi.org/10.1111/pops.12905>
- Golossenko, A., Palumbo, H., Mathai, M., & Tran, H. A. (2023). Am I being dehumanized? Development and validation of the experience of dehumanization measurement. *British Journal of Social Psychology*, 62(3), 1285–1329. <https://doi.org/10.1111/bjso.12633>
- Gray, H. M., Gray, K., & Wegner, D. M. (2007). Dimensions of mind perception. *Science*, 315(5812), 619. <https://doi.org/10.1126/science.1134475>
- Haque, O. S., & Waytz, A. (2012). Dehumanization in Medicine: Causes, Solutions, and Functions. *Perspectives on Psychological Science: A Journal of the Association for Psychological Science*, 7(2), 176–186. <https://doi.org/10.1177/1745691611429706>
- Harris, L. T., & Fiske, S. T. (2006). Dehumanizing the Lowest of the Low: Neuroimaging Responses to Extreme Out-Groups. *Psychological Science*, 17(10), 847–853.
- Harris, L. T., & Fiske, S. T. (2011). Dehumanized Perception: A Psychological Means to Facilitate Atrocities, Torture, and Genocide? *Zeitschrift Fur Psychologie*, 219(3), 175–181.
- Haslam, N. (2006). Dehumanization: An integrative review. *Personality and Social Psychology Review*, 10(3), 252–264. https://doi.org/10.1207/s15327957pspr1003_4
- Haslam, N., Bain, P. G., Douge, L., Lee, M., & Bastian, B. (2005). More human than you: Attributing humanness to self and others. *Journal of Personality and Social Psychology*, 89(6), 937–950. <https://doi.org/10.1037/0022-3514.89.6.937>
- Haslam, N., & Loughnan, S. (2014). Dehumanization and infrahumanization. *Annual Review of Psychology*, 65, 399–423. <https://doi.org/10.1146/annurev-psych-010213-115045>

- Hayes, A.F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression Based Approach*. New York, NY: Guilford Press.
- Hendricks, P. S. (2018). Awe: a putative mechanism underlying the effects of classic psychedelic-assisted psychotherapy. *International Review of Psychiatry (Abingdon, England)*, 30(4), 331–342. <https://doi.org/10.1080/09540261.2018.1474185>
- Kałużna, A., Schlosser, M., Craste, E. G., Stroud, J., & Cooke, J. A. (2022). Being no one, being One: The role of ego-dissolution and connectedness in the therapeutic effects of psychedelic experience. *Journal of Psychedelic Studies*, 6(2), 111–136. <https://doi.org/10.1556/2054.2022.00199>
- Karantzas, G. C., Simpson, J. A., & Haslam, N. (2023). Dehumanization: beyond the intergroup to the interpersonal. *Current Directions in Psychological Science*, 32(6), 501–507. <https://doi.org/10.1177/09637214231204196>
- Keltner, D., & Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. *Cognition and Emotion*, 17(2), 297–314. <https://doi.org/10.1080/02699930302297>
- Kim, S. Y., Cheon, J. E., & Kim, Y.-H. (2024). A Cross-Cultural Examination of Blatant and Subtle Dehumanization of Autistic People. *Journal of Autism and Developmental Disorders*, 1–17. <https://doi.org/10.1007/s10803-023-06217-x>
- Konečni, V. J. (2005). The aesthetic Trinity: Awe, being moved, thrills. *PsycEXTRA Dataset*. <https://doi.org/10.1037/e674862010-005>
- Krumrei-Mancuso, E. J., Trammell, J. P., & Harriger, J. A. (2023). Affective, cognitive, and environmental inductions of humility and intellectual humility that center on self-transcendence. *The Journal of Positive Psychology*, 1–19. <https://doi.org/10.1080/17439760.2023.2257680>
- Kteily, N., Bruneau, E., Waytz, A., & Cotterill, S. (2015). The ascent of man: Theoretical and empirical evidence for blatant dehumanization. *Journal of Personality and Social Psychology*, 109(5), 901–931. <https://doi.org/10.1037/pspp0000048>
- Kteily, N. S., & Landry, A. P. (2022). Dehumanization: trends, insights, and challenges. *Trends in Cognitive Sciences*, 26(3), 222–240. <https://doi.org/10.1016/j.tics.2021.12.003>

- Landry, A. P., Fincher, K., Barr, N., Brosowsky, N. P., Protzko, J., Ariely, D., & Seli, P. (2024). Harnessing dehumanization theory, modern media, and an intervention tournament to reduce support for retributive war crimes. *Journal of Experimental Social Psychology, 111*.
<https://doi.org/10.1016/j.jesp.2023.104567>
- Landry, A. P., Orr, R. I., & Mere, K. (2022). Dehumanization and mass violence: A study of mental state language in Nazi propaganda (1927–1945). *PLoS ONE, 17*(11), 1–14.
<https://doi-org.proxy-ub.rug.nl/10.1371/journal.pone.0274957>
- Leyens, J.-P., Rodriguez-Perez, A., Rodriguez-Torres, R., Gaunt, R., Paladino, M.-P., Vaes, J., & Demoulin, S. (2001). Psychological essentialism and the differential attribution of uniquely human emotions to ingroups and outgroups. *European Journal of Social Psychology, 31*(4), 395–411. <https://doi.org/10.1002/ejsp.50>
- Lucht, A., & van Schie, H. T. (2024). The evolutionary function of awe: A review and integrated model of seven theoretical perspectives. *Emotion Review, 16*(1), 46–63.
<https://doi.org/10.1177/17540739231197199>
- Luo, L., Mao, J., Chen, S., Gao, W., & Yuan, J. (2021). Psychological research of awe: Definition, functions, and application in psychotherapy. *Stress and Brain, 1*(1), 59–75.
<https://doi.org/10.26599/sab.2020.9060003>
- Lv, Y., Tang, Q., Wang, S., Tao, Y., Zhang, C., & Liu, X. (2023). Awe weakens the blatant dehumanization of people with obesity via common ingroup identity. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*.
<https://doi.org/10.1007/s12144-023-05509-w>
- Lynn, S. J., McDonald, C. W., Sleight, F. G., & Mattson, R. E. (2023). Cross-validation of the ego dissolution scale: implications for studying psychedelics. *Frontiers in Neuroscience, 17*.
<https://doi.org/10.3389/fnins.2023.1267611>
- Lyshol, J. K. B., Thomsen, L., & Seibt, B. (2020). Moved by observing the love of others: Kama Muta evoked through media fosters humanization of Out-Groups. *Frontiers in Psychology, 11*. <https://doi.org/10.3389/fpsyg.2020.01240>

- Maoz, I., & McCauley, C. (2008). Threat, Dehumanization, and Support for Retaliatory Aggressive Policies in Asymmetric Conflict. *Journal of Conflict Resolution*, 52(1), 93–116. <https://doi.org/10.1177/0022002707308597>
- Martínez, R., Rodríguez-Bailón, R., & Moya, M. (2012). Are they animals or machines? Measuring dehumanization. *The Spanish Journal of Psychology*, 15(3), 1110–1122. https://doi.org/10.5209/rev_SJOP.2012.v15.n3.39401
- Maynard, J. L., & Luft, A. (2023). Humanizing dehumanization research. *Current Research in Ecological and Social Psychology*, 4, 100102. <https://doi.org/10.1016/j.cresp.2023.100102>
- Mikkola, M. (2016). *The wrong of injustice: dehumanization and its role in feminist philosophy*. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780190601072.001.0001>
- Millière, R. (2017). Looking for the self: Phenomenology, neurophysiology and philosophical significance of drug-induced ego dissolution. *Frontiers in Human Neuroscience*, 11, Article 245. <https://doi.org/10.3389/fnhum.2017.00245>
- Monroy, M., & Keltner, D. (2023). Awe as a pathway to mental and physical health. *Perspectives on Psychological Science*, 18(2), 309–320. <https://doi.org/10.1177/17456916221094856>
- Naclerio, M., & Van Cappellen, P. (2021). Awe, Group Cohesion, and Religious Self-Sacrifice. *International Journal For The Psychology Of Religion*, 32(3), 256–271. <https://doi.org/10.1080/10508619.2021.1975423>
- Nour, M. M., Evans, L., Nutt, D., & Carhart-Harris, R. L. (2016). Ego-dissolution and psychedelics: Validation of the Ego-Dissolution Inventory (EDI). *Frontiers in Human Neuroscience*, 10. <https://doi.org/10.3389/fnhum.2016.00269>
- Piff, P. K., Dietze, P., Feinberg, M., Stancato, D. M., & Keltner, D. (2015). Awe, the small self, and prosocial behavior. *Journal of Personality and Social Psychology*, 108(6), 883–899. <https://doi.org/10.1037/pspi0000018>
- Prade, C., & Saroglou, V. (2016). Awe's effects on generosity and helping. *The Journal Of Positive Psychology*, 11(5), 522–530. <https://doi.org/10.1080/17439760.2015.1127992>

- Prati, F., Crapolicchio, E., Dvorakova, A., Di Bernardo, G. A., & Ruzzante, D. (2023). Effective ways for reducing dehumanization: interpersonal and intergroup strategies. *Current Opinion in Behavioral Sciences*, 51. <https://doi.org/10.1016/j.cobeha.2023.101277>
- Rousseau, D. L., Gorman, B., & Baranik, L. E. (2023). Crossing the Line: Disgust, Dehumanization, and Human Rights Violations. *Socius*, 9. <https://doi.org/10.1177/23780231231157686>
- Schaffer, V., Huckstepp, T., & Kannis-Dymand, L. (2023). Awe: A systematic review within a cognitive behavioural framework and proposed cognitive behavioural model of awe. *International Journal of Applied Positive Psychology*. <https://doi.org/10.1007/s41042-023-00116-3>
- Schroeder, J., & Epley, N. (2020). Demeaning: Dehumanizing others by minimizing the importance of their psychological needs. *Journal of Personality and Social Psychology*, 119(4), 765–791. <https://doi.org/10.1037/pspa0000199>
- Song, J. Y., Klebl, C., & Bastian, B. (2023). Awe promotes moral expansiveness via the small-self. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1097627>
- Tausen, B. M., Charleson, M., & Fingerhut, L. (2021). Proximity with limited humanity: How hosting a tent city impacted college students' perceptions of individuals experiencing homelessness. *Journal of Community Psychology*, 49(7), 2853–2873. <https://doi.org/10.1002/jcop.22630>
- Tausen, B. M., Lee, J. H., Dischinger, A. S., & Dennis, I. A. (2023). When dehumanization does (and does not) matter: Exploring the relationship between social justice motivations, avoidant behaviors, and intentions to help individuals experiencing homelessness. *Journal of Applied Social Psychology*, 53(9), 835–849. <https://doi.org/10.1111/jasp.12971>
- Vaes, J., Paladino, M. P., & Haslam, N. (2020). Seven clarifications on the psychology of dehumanization. *Perspectives on Psychological Science*, 16(1), 28–32. <https://doi.org/10.1177/1745691620953767>
- Van Cappellen, P., & Saroglou, V. (2012). Awe activates religious and spiritual feelings and behavioral intentions. *Psychology of Religion and Spirituality*, 4(3), 223–236.

<https://doi.org/10.1037/a0025986>

- van Mulukom, V., Patterson, R. E., & van Elk, M. (2020). Broadening Your Mind to Include Others: The relationship between serotonergic psychedelic experiences and maladaptive narcissism. *Psychopharmacology*, 237(9), 2725–2737. <https://doi.org/10.1007/s00213-020-05568-y>
- Viki, G. T., Osgood, D., & Phillips, S. (2013). Dehumanization and self-reported proclivity to torture prisoners of war. *Journal of Experimental Social Psychology*, 49(3), 325–328. <https://doi.org/10.1016/j.jesp.2012.11.006>
- Wu, Q., Cui, L., Han, X., Ding, W., & He, W. (2023). Awe and wise reasoning in adolescents: The mediating role of small-self and need for relatedness. *Heliyon*, 9(4), e15235. <https://doi.org/10.1016/j.heliyon.2023.e15235>
- Yaden, D. B., Haidt, J., Hood, R. W., Vago, D. R., & Newberg, A. B. (2017). The Varieties of Self-Transcendent Experience. *Review of General Psychology*, 21(2), 143–160. <https://doi.org/10.1037/gpr0000102>
- Yaden, D. B., Iwry, J., Slack, K. J., Eichstaedt, J. C., Zhao, Y., Vaillant, G. E., & Newberg, A. B. (2016). The overview effect: Awe and self-transcendent experience in space flight. *Psychology Of Consciousness*, 3(1), 1–11. <https://doi.org/10.1037/cns0000086>
- Yaden, D. B., Kaufman, S. B., Hyde, E., Chirico, A., Gaggioli, A., Zhang, J. W., & Keltner, D. (2018). The development of the Awe Experience Scale (AWE-S): A multifactorial measure for a complex emotion. *The Journal of Positive Psychology*, 14(4), 474–488. <https://doi.org/10.1080/17439760.2018.1484940>
- Zhu, H., Duan, X., & Su, Y. (2021). Is the sense of awe an effective emotion to promote product sharing: based on the type of awe and tie strength. *Journal Of Contemporary Marketing Science*, 4(3), 325–340. <https://doi.org/10.1108/jcmars-10-2021-0036>

Appendix A

Measures and materials

Experimental manipulation

Awe Group: Kitik Dima. (2023a, November 30). *Space 5min #2* [Video]. YouTube.

https://www.youtube.com/watch?v=_1AQo2lz2eE

Humor Group: Adam Crossley. (2013, May 8). *Lifted - Pixar* [Video]. YouTube.

<https://www.youtube.com/watch?v=LVL0c6FrLi0>

Woodworking Group: Kitik Dima. (2023b, November 30). *Woodworking* [Video]. YouTube.

https://www.youtube.com/watch?v=Z7DaFIk_pp4

Manipulation checks

Positive Affect: How positive did you feel during the video?

Negative Affect: How negative did you feel during the video?

Awe: The video was powerful and awe inspiring *and*
The video elicited a feeling of wonder in me.

Need for Accommodation:⁸ I was challenged to mentally process what I was experiencing during the video *and*
During the video, I found it hard to comprehend the experience in full.

⁸ Both items are taken from the *Awe Experience Scale* (AWE-S; see Yaden et al., 2018).

Subtle dehumanization

Stimulus:



Mechanistic dehumanization:

HN 1: I feel like homeless alcoholics are friendly. (*reversed scoring*)

HN 2: I feel like homeless alcoholics are interpersonally warm. (*reversed scoring*)

HN 3: I feel like homeless alcoholics are superficial like they have no depth.

HN 4: I feel like homeless alcoholics are mechanical and cold.

Animalistic dehumanization:

HU 1: I feel like homeless alcoholics are polite. (*reversed scoring*)

HU 2: I feel like homeless alcoholics are intelligent. (*reversed scoring*)

HU 3: I feel like homeless alcoholics are savage.

HU 4: I feel like homeless alcoholics are primitive.

Ego dissolution⁹

Ego loss:

1: During the video, I experienced a dissolution of my 'self' or ego.

2: During the video, I experienced a disintegration of my 'self' or ego.

3: During the video, I lost all sense of ego.

4: During the video, all notion of self and identity dissolved away.

Unity:

1: During the video, I felt at one with the universe.

2: During the video, I felt a sense of union with others.

3: During the video, I experienced a decrease in my sense of self-importance.

⁹ In the actual study, items from both categories were included in random order: EL1, U1, U2, U3, EL2, U4, EL3, EL4.

4: During the video, I felt far less absorbed by my own issues and concerns.

Appendix B

Ego dissolution

Table 3

Descriptives for ego dissolution scores across experimental groups

Group	Awe	Control
Ego Loss	2.08 (1.0) ^a	1.8 (.82) ^b
Unity	2.25 (.95) ^a	1.94 (.77) ^b
Total	2.16 (.92) ^a	1.87 (.74) ^b

Note. DSCF pairwise comparisons were performed to determine statistically significant group differences.

^{a, b} These superscripts indicate statistically significant group differences.

Figure 3

Histogram of the overall distribution of ego dissolution scores

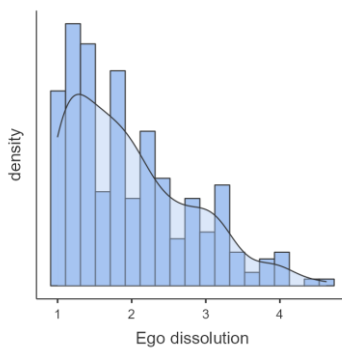


Figure 4

Q-Q plot of overall ego dissolution scores

