



The metadehumanization induction task: a new paradigm to measure dehumanization feelings

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Abstract

Metadehumanization (the feeling of being considered as less than human by others) constitutes a blooming research field in psychology. However, the available tasks manipulating metadehumanization are suboptimal, notably because they are based on feedback generating negative emotions and thus hamper the specific measure of metadehumanization. We created a task specifically inducing metadehumanization, the Metadehumanization Induction Task, and tested its validity among 324 healthy participants. A cover story first instructed participants that the task evaluates human social cognition processes. They had then to (1) produce social cognition evaluations on interpersonal stimuli; (2) determine the human nature of similar evaluations performed by other humans or computer-based; (3) read other individuals' judgements on the human nature of their own productions (i.e., whether they believed it was produced by the participant or by a computer). This third phase elicited feelings of humanization or dehumanization, each participant taking part in three counterbalanced conditions: humanization, dehumanization and re-humanization. We recorded metadehumanization (measured with a validated 13-item questionnaire) and negative emotions at baseline and after each condition. The task successfully induced specific metadehumanization, distinct from negative emotions. It also re-humanized participants after dehumanization. The Metadehumanization Induction Task is thus easy to implement, can be conducted offline or online, is adapted for neuroscience explorations, and can dehumanize and/or (re-)humanize participants. It constitutes the first tool specifically manipulating metadehumanization and measuring its consequences.

Keywords Metadehumanization · Emotion · Stigmatization · Fundamental needs

Introduction

Human interactions are guided by social rules, determining which attitudes and behaviors are prescribed or prohibited, and thus shaping individuals' expectations in interpersonal contexts. An important rule states that, in most contexts, each human being should be acknowledged, listened to, and recognized. However, in some situations, individuals are not considered or respected and are not treated as fully

humans. Dehumanization corresponds to this psychological process during which individuals or groups are perceived as lacking human qualities, generating a diminished recognition of their human nature and worth. Dehumanization differs from ostracism and social rejection, even though the concepts are related. Ostracism and social rejection consist of behaviors that can range from ignoring another person's presence to actively expelling them from a group or existing relationship (DeWall & Bushman, 2011) whereas dehumanization implies the specific denial of the humanity of others, which can be done through various behaviors such as dehumanizing speech (e.g., "you are a beast") or treatments (e.g., letting homeless or migrant live in inhumane conditions). It is a pervasive phenomenon varying in intensity as it does not only apply to contexts associated with blatant stigmatization [e.g., psychiatry (Fontesse et al., 2021) or racial discrimination (Howard & Vine, 2024)] but also occurs in more subtle situations involving larger social categories like elderly people (Boudjemadi et al.,

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2017) or women (Ligman et al., 2025). As proposed by the bidimensional theoretical model of dehumanization (Haslam, 2006; Haslam & Loughnan, 2014), dehumanization manifests in two predominant forms: mechanistic and animalistic. On the one hand, mechanistic dehumanization corresponds to the denial of human nature characteristics, namely characteristics perceived as essential to humans but not defined by comparing them with other entities, such as interpersonal warmth, personality, or unicity. An example of mechanistic dehumanization is when workers in highly automated environments are treated as emotionless, replaceable, reducing them to mere instruments of productivity rather than individuals with thoughts and feelings. On the other hand, animalistic dehumanization is based on the denial of uniquely human characteristics, namely characteristics that distinguish humans from animals (e.g., maturity, moral constraint, or civility). For example, animalistic dehumanization occurs when a group is portrayed as savage, primitive, or lacking self-control, such as historical depictions of enemy soldiers as “barbaric” to justify wartime violence. Experimental studies have globally supported the proposal that dehumanization can occur in various contexts and impact attitudes, emotions and behaviors towards the targeted individuals (Roupa et al., 2024), but recent work has questioned this bifactorial structure, rather supporting a unidimensional approach of dehumanization (Chevallereau et al., 2021; Golossenko et al., 2023).

The dehumanization literature has classically focused on the exploration of dehumanization from the perpetrator’s perspective, far less being known regarding the targets of this dehumanization (Moradi, 2013). More recently, a research line has emerged to understand the victims’ perspective by exploring the conditions in which they realize that they are targeted by dehumanization and generate feelings associated with such dehumanization. This experience relates to the concept of metadehumanization, namely the feeling, by the dehumanized individual, of being perceived as less human or not human at all by others, either by neglect or intent (Kteily et al., 2016). The exploration of metadehumanization has emerged as a blooming field in experimental and social psychology, notably identifying its antecedents (e.g., ostracism; Bastian & Haslam, 2010) and consequences, including negative emotions (e.g., anger, sadness or guilt; Fontesse et al., 2020; Zhang et al., 2017), cognitive deconstruction (characterized by apathy, emotional numbing, altered time perception, a focalization on the present and a lack of abstract thoughts; Twenge et al., 2003; Zhang et al., 2017) and self-dehumanization (i.e., the integration of dehumanization in the victim’s self-concept; Loughnan et al., 2017). An integrated theoretical model of metadehumanization, anchored in its empirical measure

in various contexts (i.e., among psychiatric populations, women and workers) has been proposed (Demoulin et al., 2021), identifying both its key antecedents (e.g., fundamental psychological needs thwarting) and consequences (e.g., negative emotions, reduced self-esteem, maladaptive coping strategies). Importantly, this model (1) promotes a trans-situational conceptualization of metadehumanization, describing it as a widespread phenomenon not circumscribed to extreme situations. Indeed, individuals tend to perceive themselves as more human than others (Haslam et al., 2005), increased self-humanness perception being the default tendency in the majority of the population. However, subtle dehumanization instances are very common in everyday life, even in non-stigmatized populations (Goff et al., 2008), which generates a frequent contrast between high self-perceived humanness and experienced dehumanization generated by others’ influence, ending up in metadehumanization; (2) proposes a clear distinction between metadehumanization per se (i.e., increased perception/feelings of being considered as less human by others) and its consequences. Particularly, while metadehumanization frequently generates negative emotions (e.g., Caesens et al., 2017), it can be dissociated from such negative affect in some contexts or populations (e.g., individuals with severe alcohol use disorders, Fontesse et al., 2024). In other words, this model proposes that individuals can feel genuinely and strongly dehumanized without experiencing strong consequences and negative emotions, which are to be considered as by-products rather than core components of metadehumanization.

In view of the growing importance of metadehumanization in experimental and social psychology, there is a need to offer efficient paradigms able to elicit specific dehumanization feelings in various populations, notably to explore its antecedents and consequences. However, the currently available tasks aiming to induce metadehumanization are suboptimal. Indeed, the first way to explore metadehumanization is to measure it among individuals already victims of dehumanization, for example due to their gender (e.g., Chevallereau et al., 2021), religion (e.g., Kteily et al., 2016) or psychiatric status (e.g., Fontesse et al., 2021). Such approach has a high ecological value by allowing to measure metadehumanization in intense dehumanization contexts, but it hampers its precise manipulation and does not allow to dissociate metadehumanization from its consequences. A second and more controlled way to explore metadehumanization is to experimentally manipulate it among unselected participants. Studies proposing such manipulation of dehumanization feelings are still scarce, but researchers have capitalized on three approaches. The first one is to use vignettes describing interpersonal maltreatments and to ask participants to imagine how

dehumanized they would feel in these situations (Bastian & Haslam, 2011). While offering initial insights on metadehumanization, such manipulation is highly questionable as it presents very low ecological validity and centrally does not elicit real metadehumanization but rather expected/imagined dehumanization feelings among individuals who do not actually feel dehumanized, hence missing the objective of eliciting genuine metadehumanization. The second one (Borinca et al., 2021, 2024, 2025; Kteily et al., 2016) used bogus articles or excerpts from fake scientific articles to manipulate metadehumanization among groups with real-life conflicts (e.g., Palestinians versus Israelis; Americans versus Arabs; Serbs versus Kosovo Albanians). These studies have successfully manipulated metadehumanization by altering how participants' ingroup (e.g., the Kosovo Albanians) is perceived by the outgroup (e.g., the Serbs) as either equally or less evolved/civilized. While highly valuable, this line of work focused on broad metadehumanization feedback that targets participants' ingroup instead of them individually. Participants could thus escape metadehumanization by distancing themselves from their ingroups, and these group-based paradigms should hence be complemented by approaches targeting metadehumanization at the individual level. Examining how people respond to being personally dehumanized, rather than through group association, would offer complementary insights into the psychological dynamics of metadehumanization. The third approach adopted such individual perspective by confronting participants with real dehumanizing situations. To do so, Zhang et al. (2017) proposed a computerized dyadic task, after which participants had to provide an evaluation of the other individual by selecting personality traits from a pre-defined list. They also received feedback from the other participant, pre-determined to induce animalistic (e.g., impulsive, immature, uncivilized) or mechanistic (e.g., cold, inert, passive) metadehumanization. While being more ecological, this study, in line with previous ones, did not allow manipulating metadehumanization *per se* but rather presented feedback eliciting negative feelings (i.e., the perception of presenting some non-human personality traits) supposed to indirectly promote metadehumanization. Moreover, a key limitation of this approach is that it conflates the manipulation of metadehumanization with its consequences, particularly negative emotions (elicited by negative feedback), hampering the exploration of "pure" metadehumanization.

Previous studies thus failed to offer an efficient tool to simultaneously (1) elicit, in unselected individuals, an unequivocal feeling of being considered as less than human by another human; (2) distinguishing metadehumanization from its frequent consequences, particularly negative emotions. The goal of the present study is to create and validate

a task meeting these methodological requests, namely generating pure metadehumanization (by making participants realize that they are considered as "nonhumans") while reducing the overlap with its related effects (by standardizing the valence of the feedback provided to participants across conditions). We thus aimed at moving the metadehumanization field forward to allow its robust, direct and reliable manipulation in various populations, by explicitly telling participants that they have been perceived as less than human or not human at all by other real individuals, which has never been performed in previous manipulations of metadehumanization. We hypothesized that participants would report significantly more metadehumanization feelings after a condition generating dehumanization compared to baseline or to conditions promoting humanization. We also expected participants to report more negative emotions following the dehumanization conditions compared to other conditions, as a consequence of metadehumanization.

Materials and methods

Participants

As a reliable *a priori* power analysis was impossible due to the absence of earlier validation study of experimental tasks inducing metadehumanization, we estimated our requested sample size based on previous studies validating (meta)dehumanization questionnaires (e.g., Golossenko et al., 2023, including a mean of 269 participants per study). We recruited 324 English-speaking participants on the Prolific Academic platform. This sample size provided 80% power to detect an effect size of $\eta^2=0.0042$ or greater for within-group effects in a repeated measures ANOVA with a 5% false-positive rate. Participants received a compensation of 5,03£ for their participation. All participants provided informed written consent. Participants were mostly males (55.9%) and were 32-year-old ($S.D.=11.8$) on average.

Ethical and transparency statement

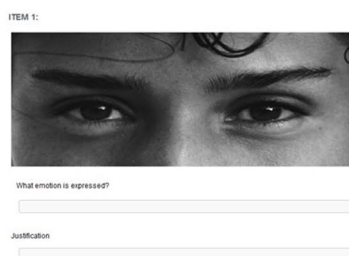
The bioethical committee of the University approved the current study. All procedures contributing to this work comply with the ethical standards of the Helsinki Declaration of 1975, as revised in 2008. This study's design and its analysis were not preregistered. Data, analysis code, research materials and the Metadehumanization Induction Task are fully and publicly available on the Open Science Framework: https://osf.io/hkcea/?view_only=ca4f228213984d5d8694526f382b2d57. All studies, measures, manipulations, and data/participant exclusions are reported in the present manuscript.

Cover story, task and procedure (Fig. 1)

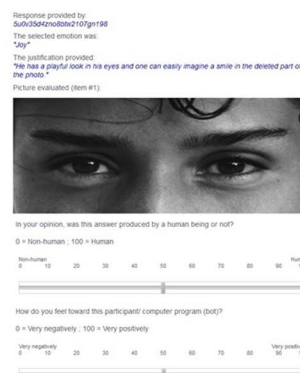
We used OpenSesame software (Mathôt et al., 2012) for the building and presentation of the experimental task. To mask the real goal of the study, we presented the experiment to participants as a study on the specific characteristics determining human social cognition processes, as compared to non-human (i.e., computer-based) ones (see Supplementary Material 1 for all the instructions provided to participants). The experiment consisted in three successive phases as we (1) asked participants to evaluate the emotion expressed by cropped pictures of the upper part of multiple faces (Phase 1). We used stimuli from the Reading the Mind in the Eyes Test (Baron-Cohen et al., 2001) as this test involves high-level social cognition processes (i.e., identifying the emotion expressed by equivocal human faces) that can be considered as related to purely human abilities and thus constitute relevant criteria to distinguish humans from computer programs; (2) presented participants with similar evaluations made by “other participants or by a computer program” and requested them to indicate if they believed that the written evaluation was produced by a human or a non-human, namely a computer program (all evaluations were actually created by the experimenters and were similar for all participants) (Phase 2). This phase allowed reinforcing the cover story and ensuring the correct understanding of concepts (non-human vs. human; negative vs. positive); (3) requested participants to read other individuals’ evaluations of their own productions, which constituted the metadehumanization induction phase as some of these feedbacks described participants’ productions as created by a non-human (Phase 3). These feedbacks contained two evaluations, respectively related to humanity (dehumanizing vs. humanizing) and valence (negative

vs. positive). Importantly, in the three successive phases, all stimuli were totally standardized so that all participants were confronted with the exact same stimuli in the exact same order. We organized the experiment in two sessions separated by two to four days. The first session was used to present the cover story and included the production and judgment phases (Phases 1–2), and the second session (Phase 3) included metadehumanization manipulation. We opted for such minimal two-days delay between phases to increase the credibility of the task, namely to create a realistic time to pretend gathering the reported evaluation of participants’ production by other individuals. We conducted a pretest phase to assess the credibility of the cover story, during which 66 participants completed the Metadehumanization Induction Task. At the end of the task, we asked two open-ended questions: (1) “Do you think you have been evaluated by real humans?” and (2) “Do you think the evaluations related to your production were genuine?”. Only two participants (3% of the sample) reported that they did not believe the task and recognized the cover story as a fabrication with fake evaluations. Additionally, 19.5% of participants expressed some doubts or questions about the protocol but still believed that the feedback was real and provided by humans. The remaining 77.5% fully accepted the cover story without expressing any doubt. Overall, this pretest phase demonstrated that 97% of participants perceived the cover story as credible and performed the task under the belief that the feedback was generated by real individuals, fully confirming the effectiveness of our cover story. We advise future studies using the Metadehumanization Induction Task to systematically incorporate such manipulation check to ensure that the cover story was efficient in their specific sample and to potentially exclude participants who did not believe this cover story.

A. Production Phase



B. Evaluation Phase



C. Feedback Phase

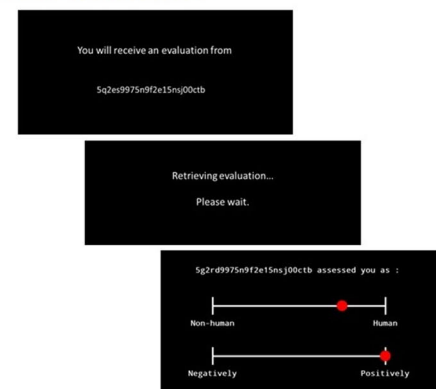


Fig. 1 Presentation of the experimental design including three successive phases: (a) *Production phase*, where participants have to identify and describe the emotions presented by stimuli extracted from the Reading the Mind in the Eyes test; (b) *Evaluation phase*, where participants have to judge whether the presented productions have been generated by a human being or a computer, and have to rate the emotions

(positive/negative) they feel towards the human/computer who generated this production; (c) *Feedback phase*, where participants receive evaluations from other fake participants, each evaluation describing the production of the participant as generated by a human being or a computer and as eliciting positive/negative emotions for the evaluator

Phase 1: production

Participants performed an adapted version of the Reading the Mind in the Eyes Test (RMET; Baron-Cohen et al., 2001), with ten pictures successively presented without the multiple-choice option. For each picture, participants had to write down which emotion was expressed and to briefly justify their choice (Fig. 1, part A). Following this production phase, we told participants that their productions would be judged by “other participants” regarding their human nature (i.e., whether “these participants believed” that the production had been made by a human or a computer) and their evaluation of him/her (i.e., whether they had a positive or negative opinion of the participant) and that they will receive these feedbacks during the second session.

Phase 2: evaluation

This phase was exclusively dedicated to reinforce the cover story and ensure that participants understood the difference between non-human/human and the negative/positive valences. We thus did not analyze the data related to this phase. We asked participants to judge fictional productions (similar to the ones they made at Phase 1), presented as performed by other participants. Participants watched 10 items, each composed of an RMET picture, the emotion identified, and the justification made by “another participant or a computer program” based on this picture (Fig. 1, part B). Participants then judged whether the production was performed by a human or by a computer program, using a scale ranging from 0 (non-human) to 100 (human). Participants also expressed how they felt toward this human/computer program using a scale from 0 (very negatively) to 100 (very positively).

Phase 3: feedback

This phase constituted the main manipulation as it assessed the effect of dehumanizing *versus* humanizing feedbacks on the metadehumanization reported by participants. They were told that they would be confronted with the evaluations of other participants on their productions. First, to reinforce the cover story, participants viewed a screen (for 1000ms) with the fake Prolific ID code of other participants (e.g., “You will receive an evaluation from “5g2rd-9975n9f2e15nsj00ctb””), followed by another screen (for 1000ms) mimicking the internet connection to the evaluation (i.e., “Retrieving evaluation... Please wait”). The evaluation of the other person in each trial was represented on a scale from non-human to human and from negative to positive (i.e. “5g2rd9975n9f2e15nsj00ctb assessed you as ...”; Fig. 1, part C). To control that participants paid attention

to these feedbacks, actually processed them and understood the human/non-human and positive/negative evaluation of their productions, we asked them to remember the feedback and to indicate just after it, through binary choices, whether they had been globally judged as non-human or human, and negatively or positively.

Each participant took part in three different blocks, each related to an experimental condition, namely: the *humanization block*, in which participants received significantly more humanizing feedbacks; the *dehumanization block*, in which participants received significantly more dehumanizing feedbacks; the *re-humanization block*, in which participants received significantly more humanizing feedbacks. This last block was added to explore how long it took to re-humanize participants after a period of dehumanization. To maintain credibility, each block was constituted of 38 trials, of which 32 were congruent and 6 incongruent (e.g., in the humanization block, 32 items were humanizing and 6 were dehumanizing). The order effect was controlled in the first two conditions, as half of the participants started with the humanization block and the other half started with the dehumanization block. The re-humanization block was the last one for all participants. Centrally, we also controlled for the valence of the feedback. Indeed, the emotional evaluations shown to participants were neutral in mean for the humanizing and dehumanizing trials of each block (50% of trials were positive and 50% negative, with balanced intensity).

Debriefing

During the debriefing, we informed all participants regarding the real goal of the study, and we made them aware that all feedbacks were computer-generated.

Metadehumanization measures

We assessed metadehumanization four times. First, at the beginning of the feedback phase (baseline, T0), and then after each block (humanization and dehumanization, [which were counterbalanced for T1 and T2], and re-humanization [T3]). We recorded this subjective experience through the following assessments:

Metadehumanization scale

In order to assess metadehumanization, defined as the feeling by the dehumanized individual of being perceived as less human or not human at all by others (Kteily et al., 2016), we used a validated 13-item scale directly evaluating how participants felt dehumanized by the fake participants (e.g., “Other participants perceive me as an object”, “[...] as someone lacking intelligence and competence” for the full

scale, see Supplementary Material 2). This scale is based on previous research in metadehumanization (Fontesse et al., 2020), using the exact same 13 items. The only modification concerned the instructions that were adapted to the present design, namely replacing “As an alcohol-dependent individual, society treats me as...” (as the previous study was implemented in populations presenting alcohol use disorders) by “Other participants perceive me as...” before each item. This scale measures the main components of dehumanization identified in the literature (e.g., lack of empathy, immorality) and uses the main metaphors (e.g., object, animal, automata). Participants indicated their agreement with each statement using a 7-point Likert scale (from 1=“Totally disagree” to 7=“Totally agree”). We computed a mean score based on participants’ answers on all items for each block. The internal consistency of the scale in our sample was excellent [0.898 (baseline)/0.923 (humanization block)/0.937 (dehumanization block)/0.934 (re-humanization block)].

Negative emotions

We measured participants’ negative emotions using 5 items from the Positive and Negative Affect Scale (PANAS; Watson et al., 1988). These items (i.e., upset, hostile, ashamed, nervous, afraid) were mixed with 5 non-negative items not used in the analyses (alert, inspired, determined, attentive, active). Participants indicated the intensity at which they felt each emotion on a 5-item Likert scale (from 1=“not at all” to 5=“extremely”). The internal consistency of the scale in our sample was acceptable/good [0.773 (baseline)/0.817 (humanization block)/0.826 (dehumanization block)/0.841 (re-humanization block)].

Statistical analyses

We performed all analyses using IBM SPSS Statistics 25. To test the effect of the induction on the metadehumanization and negative emotions reported by participants, we conducted repeated ANOVAs with Bonferroni-corrected post-hoc pairwise comparisons with Block (baseline, humanization, dehumanization, and re-humanization) as within-subjects factor. As dehumanization and metadehumanization processes are strongly influenced by age and sex (e.g., Hussey et al., 2016; Ozbilgin et al., 2024; Piccoli et al., 2017), previous studies notably suggesting higher metadehumanization levels in women and younger participants (Demoulin et al., 2021), we controlled the ANOVAs for age and sex. We also controlled the order of the first block (humanization first vs. dehumanization first). We performed complementary pairwise t-tests to compare difference scores for metadehumanization and negative emotions across blocks. We set the alpha to 0.05.

Table 1 Mean values (S.D.) of metadehumanization [score range from 1 (“totally disagree”) to 7 (“totally agree”)] and negative emotions [score range from 1 (“not at all”) to 5 (“extremely”)] scores for each block (baseline, humanization, dehumanization, re-humanization)

	Baseline	Humanization	Dehumanization	Re-humanization
Meta-dehumanization	2.69 (1.02)	2.95 (1.16)	3.69 (1.36)	2.89 (1.22)
Negative emotions	1.60 (0.68)	1.57 (0.74)	1.71 (0.80)	1.54 (0.78)

Results

Table 1 presents the mean values of metadehumanization and negative emotions reported for each block. Metadehumanization scores significantly differed across blocks [$F(3,321) = 14.07$, $p < .001$, $\eta^2 = 0.04$]. The dehumanization block was significantly different from the baseline [mean difference = 1.00, 95%CI (0.80;1.2), $p < .001$], humanization [mean difference = 0.74, 95%CI (0.58;0.91), $p < .001$] and re-humanization blocks [mean difference = 0.80, 95%CI (0.63;0.98), $p < .001$]. Namely, participants reported higher metadehumanization scores after the dehumanization block than before the induction or after the humanization/re-humanization blocks. Compared to baseline, participants also reported higher metadehumanization score in the humanization [mean difference = 0.26, 95%CI (0.10;0.41), $p < .001$] and re-humanization blocks [mean difference = 0.20, 95%CI (0.03;0.37), $p < .05$]. We found no significant differences between the humanization and re-humanization blocks (Fig. 2, part A). This result centrally shows that our task successfully generated dehumanization feelings among participants during the dehumanization block, such metadehumanization being significantly higher in the dehumanization block than in the other blocks, as expected.

Of note, the order of the humanization and dehumanization blocks had a significant effect on the metadehumanization reported across blocks [$F(1,323) = 6.34$, $p < .05$, $\eta^2 = 0.02$]. Participants reported a higher level of metadehumanization across blocks when the humanization block was presented first rather than second. However, the interaction between the order of the blocks and the score reported after each block was not significant ($p > .05$). This means that the metadehumanization scores differences between blocks did not vary depending on which block (humanization or dehumanization) was presented first, showing that our main manipulation was not strongly influenced by the order of the blocks.

The other covariates (age and sex) affected metadehumanization scores. Indeed, we found main age

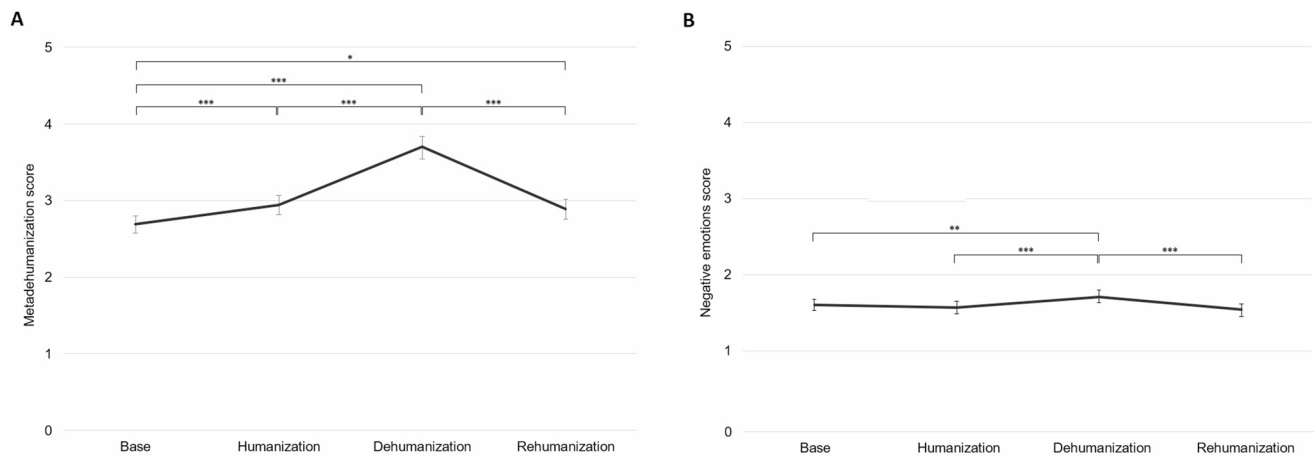


Fig. 2 Metadehumanization (Part A) and negative emotions (part B) scores for each block (baseline, humanization, dehumanization, re-humanization). (* = $p < .05$; ** = $p < .01$; *** = $p < .001$)

[$F(1,323) = 5.54, p < .05, \eta^2 = 0.02$] and sex [$F(1,323) = 6.60, p < .05, \eta^2 = 0.02$] effects. Older participants reported less metadehumanization than younger ones. Female participants reported more metadehumanization than males. Moreover, we found an interaction between block and sex [$F(3,321) = 6.87, p < .001, \eta^2 = 0.02$]. Namely, metadehumanization scores varied according to the sex of participants in the humanization [$B = -0.45, 95\%CI (-0.70; -0.20), p < .001, \eta^2 = 0.04$] and re-humanization [$B = -0.40, 95\%CI (-0.66; -0.14), p < .01, \eta^2 = 0.03$] blocks but not at baseline ($p > .05$). Male participants reported less metadehumanization in the humanization and re-humanization blocks than female participants. As a whole, these results show that the impact of metadehumanization induction is influenced both by age (reduced dehumanization feelings in older individuals) and sex (reduced dehumanization feelings in men). However, it should be noted that our results and main findings remained unchanged when removing age and sex from covariates.

Regarding negative emotions, we found no significant variations across blocks when comparing all blocks together ($p > .05$). However, Bonferroni-corrected pairwise comparisons revealed that the scores after the dehumanization block were significantly higher than those observed for baseline [mean difference = 0.11, 95%CI (0.02; 0.19), $p < .01$], humanization [mean difference = 0.15, 95%CI (0.07; 0.22), $p < .001$] and re-humanization blocks [mean difference = 0.18, 95%CI (0.09; 0.26), $p < .001$]. We found no significant difference between baseline, humanization block and re-humanization block regarding negative emotions ($p > .05$; Fig. 2, Part B). As expected, increased metadehumanization was thus associated with increased negative feelings.

We also checked the effect of the covariates on negative emotions. We found no significant effect of sex or first block presented on negative emotions, but we revealed a

main effect of age [$F(1,323) = 12.21, p < .01, \eta^2 = 0.04$]. Older participants reported fewer negative emotions than younger ones. Furthermore, the interaction between age and the block variable on negative emotions was also significant [$F(3,321) = 3.44, p < .05, \eta^2 = 0.01$]. The effect of age was maintained on each block but appeared slightly larger for the dehumanization block [$B = -0.02, 95\%CI (-0.02; -0.01), p < .001, \eta^2 = 0.05$] than for the other blocks: baseline [$B = -0.01, 95\%CI (-0.01; -0.00), p < .01, \eta^2 = 0.03$], humanization [$B = -0.01, 95\%CI (-0.02; -0.00), p < .01, \eta^2 = 0.02$], and re-humanization [$B = -0.01, 95\%CI (-0.02; -0.00), p < .05, \eta^2 = 0.02$]. Our paradigm thus elicited fewer negative emotions among older participants, particularly in the dehumanization block.

It should be noted, as illustrated in Fig. 2, that the mean difference across all blocks was significantly higher for metadehumanization scores (0.48) than for negative emotions (0.00) [$t(323) = 8.03, p < .001$]. More specifically, the difference between baseline and the dehumanization block was significantly higher for metadehumanization scores (0.99) than for negative emotions (0.11) [$t(323) = 12.15, p < .001$]. This proves that our manipulation centrally induced metadehumanization, with only a limited modulation of negative emotions.

Finally, we conducted a post-hoc power analysis using G*Power 3.1.9.4., with a repeated ANOVA including experimental blocks as within factor and computing the effect size (Cohen's $f = 0.204$) based on the η^2 of our main analysis on metadehumanization measure (i.e., 0.04) to assess the achieved statistical power. With one group of 324 individuals and four measures (i.e., the four blocks), the generated power ($1 - \beta$) was 0.999, totally confirming that we had enough statistical power to test our hypothesis.

To sum up, the results confirm that the Metadehumanization Induction Task effectively elicited feelings of

dehumanization during the dehumanization block, with significantly lower metadehumanization levels in the baseline, humanization, and re-humanization blocks. The order of humanization and dehumanization blocks influenced overall metadehumanization, and so did age and sex, but without altering the primary effect. While negative emotions increased after the dehumanization block, they remained stable across other conditions, indicating that the task primarily induced metadehumanization rather than strong emotional distress. Finally, our post-hoc power analysis confirmed the study had sufficient statistical power to support these findings.

Discussion

We developed the Metadehumanization Induction Task to offer the first tool inducing dehumanization feelings in a direct and specific way. This task constitutes crucial progress in comparison with previous metadehumanization paradigms. Indeed, previous work either capitalized on the elicitation of imagined/expected dehumanization feelings (through the presentation of vignettes, Bastian & Haslam, 2011) without directly eliciting such feelings, manipulated metadehumanization at the participants' ingroup level rather than at the individual level (Kteily et al., 2016; Borinca et al., 2021, 2024, 2025) or gave negative feedbacks to participants without directly and specifically manipulating genuine metadehumanization, hence generating confounding negative emotions (Zhang et al., 2017). Conversely, the Metadehumanization Induction Task: (1) straightforwardly induces metadehumanization as participants receive the feedback that they are not perceived as a human by other participants, which is the exact definition of dehumanization. Our task is thus a direct way to generate dehumanization feelings, while previous paradigms only manipulated concepts related to metadehumanization (e.g., feedbacks on personality traits related to dehumanization) without generating metadehumanization per se; (2) controls for the valence of the feedbacks given to the participant, as humanizing and dehumanizing blocks present the same emotional level of feedback (neutral on average); (3) provides repeated feedback of dehumanization or humanization which potentially reinforce the impact on participants and is applicable to neuroimaging studies (e.g. fMRI, EEG). Such procedure allows disentangling the core component of metadehumanization from its consequences, particularly negative emotions, which are frequently associated with dehumanization but are to be considered as by-products rather than core components of metadehumanization. It is hence important that a paradigm eliciting metadehumanization allows researchers

to induce it precisely while maintaining negative feedbacks stable across conditions.

The key result is that the Metadehumanization Induction Task effectively induced metadehumanization in healthy participants. Indeed, participants reported significantly more metadehumanization after the induction, proving that our procedure fully achieved its objective: leading the participants to feel that other individuals considered them as less than humans or as not presenting human characteristics, which is the exact definition of metadehumanization. Importantly, the levels of metadehumanization generated by the dehumanizing block (mean of 3.69/7) are high as (1) the metadehumanization questionnaire is very unambiguous and blatant, being based on items measuring extreme dehumanization (e.g., "other participants perceive me as an object"), and (2) they are higher than those reported in previous studies by clinical populations (e.g., patients with severe alcohol use disorder; Fontesse et al., 2020) known to be highly dehumanized in their everyday life and hence presenting strong dehumanization feelings. Although this comparison should be interpreted with caution, given the substantial differences in contexts, samples, and conditions between this study and prior ones in clinical populations, it suggests that our task can elevate metadehumanization to levels comparable to those previously reported in clinical samples, further underlining its ecological value. In the present study, unexpectedly, higher metadehumanization scores were reported by participants after the humanization and re-humanization blocks compared to baseline. This result likely stems from our decision to include a small proportion (16%) of incongruent trials in each block (namely dehumanizing trials in humanizing/re-humanizing blocks and vice versa) to enhance realism and credibility. The presence of dehumanizing trials in the humanization/re-humanization conditions appears sufficient to heighten dehumanization feelings among participants, further emphasizing the power of our manipulation in generating metadehumanization through dehumanizing feedbacks. To address this potential confound in future studies, reducing the number of incongruent trials (particularly dehumanizing trials in humanizing/re-humanizing blocks) could help prevent unintended metadehumanization effects in humanizing blocks. Determining the optimal feedback ratio that balances credibility (i.e., avoiding blocks with only one type of trial) and induction efficacy (i.e., eliciting the most specific and efficient metadehumanization) remains an important objective for future research. Metadehumanization scores also varied according to participants' age and sex, as older men presented lower metadehumanization scores. This result suggests the relevance of controlling these confounding variables and urges future studies to further explore the demographic and

psychological factors modulating task responsiveness and metadehumanization.

Inducing metadehumanization inevitably led to an increase in negative emotions, as reported in previous studies (Zhang et al., 2017), and we thus did not fully dissociate metadehumanization from negative emotions. However, in striking contrast with past explorations, we ensured that the present task specifically induced metadehumanization and not only negative emotions. Indeed, the evaluations of valence shown to participants were neutral in mean for the humanizing and dehumanizing trials of each block. Thus, while negative emotions were inevitably increased in the dehumanization condition as they are a known consequence of metadehumanization, dehumanization feelings were specifically elicited by our metadehumanization induction and were not just a by-product of general negative feedback, as we controlled for the valence of the emotional feedback across blocks. It has to be underlined that (1) even though the valence of dehumanizing trials was neutral in mean, they might still have been perceived as negative by participants. Indeed, being perceived as non/less human could break participants' expectations, and even neutral feedback might be perceived as negatively charged in interpersonal contexts where positive interactions are the norm. Qualitative exploration of participants' emotional experience is needed to further understand the emotional impact of the feedback provided; (2) our self-reported measure of negative emotions might have failed to capture more subtle subjective negative feelings related to metadehumanization.

Finally, our task not only proved its efficiency to increase metadehumanization among participants, but was also efficient to decrease it afterwards, namely to re-humanize them through a condition favoring humanizing feedbacks. The ability of this task to re-humanize participants is a crucial ethical consideration. Given that it induces strong feelings of metadehumanization, known to have significant negative consequences on emotional and psychological well-being, the Metadehumanization Induction Task must be used with great caution to prevent any lasting harm. Beyond the standard written and oral debriefing at the end of the task (which ensures that participants understand the dehumanizing feedback was computer-generated rather than an actual evaluation by other humans) we incorporated a re-humanization block. This step was essential to at least partly restoring participants' well-being before the task concluded, bringing their metadehumanization levels back in line with those observed during the humanization block, and ensuring the dissipation of any associated negative emotions. We strongly recommend that future studies systematically implement the re-humanization block following metadehumanization induction to mitigate any risk of prolonged dehumanization. Of note, our results showed

that the metadehumanization levels did not totally come back to baseline after the re-humanization block. This might be related to the fact that the powerful metadehumanization generated cannot be fully counterbalanced by re-humanization (further underlining the efficiency of our metadehumanization induction procedure). Another plausible explanation is that the incongruent trials integrated in the re-humanization block to maintain the credibility of the task and the cover story may have contributed to the lingering metadehumanization observed. Future studies could exclude such incongruent trials to boost re-humanization, and further exploration of this persisting metadehumanization would be valuable, notably through longitudinal follow-up or mood recovery metrics. Finally, when working with populations particularly vulnerable to dehumanization (e.g., individuals with psychiatric disorders), researchers must rigorously pretest the task. This allows for necessary adjustments, such as increasing the number of humanizing trials, to ensure that all participants leave the study feeling fully re-humanized. This ability to generate rapid switches between humanization and dehumanization further extends the usefulness of our task to explore the dynamic temporal evolution of metadehumanization.

A key advantage of the Metadehumanization Induction Task over previous paradigms is its versatility in both implementation and application. It can be administered in real-life settings or online, with the latter requiring no experimenter supervision (as demonstrated in the present design), making it scalable for large samples. Beyond its efficiency and ease of implementation, the task is highly adaptable for neuroscience research (e.g., neuroimaging studies) and provides a powerful tool for investigating the antecedents and consequences of metadehumanization while standardizing the level of negative feedback. By dissociating the manipulation of emotional feedback from metadehumanization induction, the task indeed allows a control over the intensity of negative emotions, ranging from no induction at all (e.g., to isolate "pure" metadehumanization) to simulating real-world scenarios where metadehumanization is intertwined with strong negative affect. Importantly, previous research has shown that metadehumanization manipulated at the ingroup level influences conciliatory attitudes, openness to contact, competitive victimhood, and emotional responses to outgroup help (Borinca et al., 2021, 2024, 2025). Future studies could determine whether similar findings are found in healthy or clinical samples using the Metadehumanization Induction Task, which specifically targets the individual rather than the ingroup. Crucially, we have shown that the Metadehumanization Induction Task not only induces metadehumanization but can also generate humanization. This makes it a promising tool not just for research but also for intervention and prevention, offering potential applications

in re-humanizing clinical populations that experience repeated dehumanization. However, the ability of the task to reduce, through humanization/re-humanization blocks, metadehumanization in such vulnerable groups remains to be tested in clinical settings.

The Metadehumanization Induction Task is thus the first tool to induce genuine metadehumanization in healthy populations. Its versatility also allows to induce or boost humanization feelings, and to re-humanize participants after an initial dehumanization phase. As the conception of humanness, and hence dehumanization criteria, could vary across populations and cultures, the validity of our task should be tested in other samples (e.g., adolescents, stigmatized groups, individuals with psychiatric conditions, groups with different cultural backgrounds). Moreover, while the dehumanization field is currently evolving towards a unidimensional approach of (meta)dehumanization (e.g., Chevallereau et al., 2021; Golossenko et al., 2023), future adaptation of the task might be developed to distinguish the induction of mechanistic and animalistic metadehumanization. It should also be acknowledged that, while the efficacy of the cover story was established in the pretest phase, we cannot totally exclude that some participants, following doubts on the cover story, might have presented responses influenced by demand characteristics. Future studies should incorporate an evaluation of the cover story credibility, source reliability (i.e., “was the feedback produced by real people?”) and social desirability to fully check whether participants believed the cover story or whether their responses might be guided by demand characteristics. Beyond these limitations and perspectives, the Metadehumanization Induction Task constitutes a tipping point in dehumanization research, by allowing researchers to investigate the determinants and consequences of metadehumanization in healthy individuals, but also by offering clinicians an efficient tool to increase humanization feelings among populations experiencing dehumanization.

Open practices section

Data, analysis code, research materials and the Metadehumanization Induction Task are fully and publicly available on the Open Science Framework: https://osf.io/hkcea/?view_only=ca4f228213984d5d8694526f382b2d57.

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methodology – Data acquisition and Analyses – Writing Original Draft / Alice Laniece – Conceptualization and methodology - Data acquisition and Analyses - Writing Review & Editing / Pierre Maurage – Conceptualization and methodology – Supervision and Project Administration - Writing Review & Editing. All authors approved the final version of the article.

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Data Availability Data, analysis code, research materials and the Metadehumanization Induction Task are fully and publicly available on the Open Science Framework: <https://osf.io/hkcea>

Declarations

Ethics approval The bioethical committee of the UCLouvain approved the current study. All procedures contributing to this work comply with the ethical standards of the Helsinki Declaration of 1975, as revised in 2008.

Consent to participate All participants provided informed written consent.- *Consent to publish statement:* All participants have agreed for their anonymized data to be published by signing a written agreement.

Open practices statements Data, analysis code, research materials and the Metadehumanization Induction Task are fully and publicly available on the Open Science Framework: https://osf.io/hkcea/?view_only=ca4f228213984d5d8694526f382b2d57. None of the reported studies were preregistered.

Conflicts of interest The authors declare that there were no conflicts of interest with respect to the authorship or the publication of this article.

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