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How to Tell a Dualist?

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Abstract

People exhibit conflicting intuitions concerning the mind/body links. Here, I explore a novel explanation for these inconsistencies: Dualism is a violable constraint that interacts with Essentialism. Two experiments probe these interactions. In Experiment 1, participants evaluated the emergence of psychological traits in either a replica of one's body, or in the afterlife—after the body's demise. In line with Dualism, epistemic (i.e., disembodied) traits (e.g., knowing the contrast between good/bad) were considered more likely to emerge (relative to sensorimotor/affective traits) only in the afterlife. However, so were innate traits (in line with Essentialism). To further gauge Essentialism, Experiment 2 presented the same traits to innateness judgments. Here, sensorimotor/affective (i.e., embodied) traits were considered more likely to be innate, suggesting that innateness intuitions are informed by embodiment. Moreover, innateness judgments (in Experiment 2) and embodiment intuitions (in Experiment 1) correlated. These results suggest that Dualism tacitly constrains reasoning about one's innate origins and its persistence after death. But since Dualism is “soft” and interacts with Essentialism, supernatural intuitions are chimeric, not purely ethereal.

Keywords: Dualism; Essentialism; Intuitive psychology; Experimental philosophy

1. Introduction

A large literature suggests that people intuitively consider the mind as ethereal, distinct from the body (e.g., Bloom, 2004; for review, Barlev & Shtulman, 2021). These intuitive dualist beliefs, to be clear, are mostly tacit, and they do not seem to depend on deliberate

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explicit analysis. Thus, intuitive dualist beliefs differ from the philosophical doctrine by the same name in their contents and their psychological origins. Our interest here is in *intuitive Dualism* only.

Numerous studies have shown that participants tacitly consider the mind as ethereal, distinct from the body. For example, when invited to consider a situation that replicates one's body, children (Hood, Gjersoe, & Bloom, 2012) and adults (Forstmann & Burgmer, 2015) believe that the replica is more likely to preserve a person's physical traits (e.g., hair color) than their thoughts (e.g., memory of a childhood friend). But when people reason about disembodied scenarios, such as the afterlife (Bering & Bjorklund, 2004), "mind switching" (Cohen & Barrett, 2008), and reincarnation (Chudek, McNamara, Birch, Bloom, & Henrich, 2018; White, 2015), here it is the person's thoughts that are more likely to persist. These dissociations between the body and the psyche suggest that people view body and mind as distinct substances.

Dualism is significant because it potentially defines the notion of the self—of who we think we are, and how we view others (e.g., Berent & Platt, 2021c; Starmans & Bloom, 2012). Indeed, Dualism has been implicated in numerous aspects of human cognition (for reviews, Bloom, 2004; Boyer, 2018; Musolino, 2015), from religious and supernatural beliefs (Berent, 2020; Bloom, 2007) to reasoning biases, such as the seductive allure of neuroscience (Sandboe & Berent, 2021; Weisberg, Keil, Goodstein, Rawson, & Gray, 2008), attitudes toward psychiatric disorders (Ahn, Kim, & Lebowitz, 2017; Berent & Platt, 2021a), the unborn child (Emmons & Kelemen, 2014), and patients in persistent vegetative state (Gray, Knickman, & Wegner, 2011). Intuitive Dualism, then, has the potential to detail reasoning about human health and impeded scientific literacy.

Still, whether people are, in fact, intuitive dualists has been a matter of controversy (cf., Barlev & Shtulman, 2021; Barrett et al., 2021; Bloom, 2004). Intuitive Dualism indeed faces several challenges. First, if people consider the mind as ethereal (and identify the self with the mind), then they should readily profess that the mind can persist without the body—in the afterlife, and in other supernatural beings (e.g., ghosts, demons, and gods). But while beliefs in the afterlife are indeed common across cultures (e.g., Boyer, 2018; Lomnitz-Adler, 2005), participants do not always endorse the afterlife even when Dualism is salient in their culture (e.g., Barrett et al., 2021).

Second, Dualism predicts that supernatural beings ought to be viewed as ethereal (i.e., devoid of a physical body), yet people often view supernatural beings as partly embodied (e.g., Barlev & Shtulman, 2021; Barlev, Mermelstein, Cohen, & German, 2019; Berent, 2020; Hodge, 2008; White, 2015). For example, the dead can be hungry (Lomnitz-Adler, 2005), and its birthmark reappears in reincarnation (White, 2015), spirits can only navigate using an appropriate vessel (e.g., a stone; Cohen & Barrett, 2008), and even God can get too busy to attend an urgent call (Barrett & Keil, 1996).

Another challenge to Dualism is presented by the developmental trajectory of these supernatural beliefs. While adults tend to view God as ethereal—as relatively devoid of physical traits, in the eyes of children, God exhibits both physical and psychological traits (Shtulman, 2008). These considerations suggest that the notion of an ethereal God arises by learning.

In light of these challenges, one might be tempted to conclude that Dualism sometime fails to apply, and if so, Dualism is hardly a universal constraint. To the extent people do occasionally contrast bodies and mind, this dualist stance must arise by learning, and the scope of its application is limited. Dualism, then, is an explicit, deliberate belief, not a tacit intuitive constraint that applies automatically.

But these apparent infractions of Dualism are also amenable to an alternative explanation. Namely, a dualist constraint might be simply *violable*. Indeed, the infringement of a psychological constraint does not necessarily show that the constraint in question fails to apply—a conclusion supported by decades of research in linguistics (Prince & Smolensky, 1993/2004; Smolensky, 2006). To use a familiar example, the fact that one overspends on one's morning latte does not necessarily show that cost is of no concern; rather, “cost” might be a violable constraint that is occasionally overpowered by higher-ranked pressures (e.g., the desire for a better-tasting coffee).

Infractions to Dualism, then, are not logically sufficient to conclude that Dualism is inane, nor do they imply that Dualism is an explicit belief that does not affect tacit reasoning. Rather, Dualism could be implicit and intuitive. Violations of Dualism could arise because Dualism can be overshadowed by competing cognitive constraints, such as Essentialism.

Consistent with this proposal, past research suggests that Dualism can interact with Essentialist reasoning (Berent, 2021b, 2021c; Berent & Platt, 2021a; Berent & Platt, 2021b; Berent & Platt, 2021c; Berent, Platt, & Sandoboe, 2021). Here, I explore such interactions in reasoning about supernatural beings. I hypothesize that the chimeric nature of the supernatural arises not from the failure of Dualism to apply, but rather from its lawful interactions with Essentialism.

This proposal echoes Cohen and Barrett (2011), who had noted that cross-cultural variation in reasoning about the mind–body divide could arise from a shared set of universal cognitive constraints; my goal here is to specify those putative constraints and their mode of interaction. Still, the present investigation of U.S. participants does not allow one to evaluate the universality of the relevant constraints. Accordingly, my goal here is to explore whether Dualism plays a role in this population (and whether it interacts with Essentialism). Doing so could provide an existence proof for the above-mentioned hypothesis, but it cannot speak to the universality of Dualism or its origins.

1.1. Afterlife beliefs: The interaction between Dualism and Essentialism

To illustrate the putative interaction between Dualism and Essentialism, consider the case of afterlife beliefs. Death, no doubt, results in the demise of the body; this much ought to be evident to people empirically (by viewing the physical disintegration of the corpse). Still, a perennial question arises: does death annihilate a person entirely, or can the person persist, despite the demise of their body?

One might expect intuitive reasoning about this question to be guided by two competing intuitive considerations: Dualism and Essentialism. Here, I outline the entailments of these principles and their interactions.

- a. *Dualism allows the mind to persist.* Intuitive Dualism has been identified with two distinct claims (e.g., Bloom, 2004): (a) the mind is *separate* from the body; and (b) it is the mind, not the body, that “counts” in determining a person’s identity; that is the mind is *prioritized* over the body.

Logically speaking, the second hypothesis is broader than the first: prioritizing the mind entails that it is distinct from the body, but mind–body distinction does not necessarily entail that the mind is prioritized. For the present purposes, intuitive Dualism is identified only with the narrower claim that the mind is ethereal, distinct from the body.

- b. *Essentialism informs kind membership.* For the dualist, then, the demise of the body spares a person’s mind, and as such, it *allows* the person to persist in the afterlife. But does the sparing of the person’s mind spare the *person*—is this mindless being still *them*—the same kind as the living person?

That question concerns *kind* membership, and kind membership is informed by essentialist reasoning (Gelman, 2003, 2004; Richert & Harris, 2008). Essentialism has been invoked to explain reasoning about numerous phenomena, including both living kinds, social- and manmade categories (e.g., Gelman, 2004; Newman & Knobe, 2019; Rhodes, Leslie, & Tworek, 2012). Whether people do, in fact, apply the same principles to all cases is an open empirical question; indeed, there are reasons to believe they do not (Quillien, 2018). Here, then, I consider essentialist reasoning concerning living things, specifically.

Per Essentialism, living things are what they are because they possess some hidden immutable essence that they inherit from their parents, and it is the creature’s essence that determines their kind (Gelman, 2004). A racoon, for instance, remains a racoon as long as their hidden essence is maintained; external physical transformation (e.g., being painted like a skunk) will not change its kind (Keil, 1986). So, to determine whether the transformed raccoon is still member of its kind, people might consider whether its innate hidden essence is maintained; if it is, then, notwithstanding the physical change, the transformed and original creatures would still seem one.

Similar essentialist considerations may guide reasoning about the afterlife. Since death obliterates the body, kind-membership considerations (courtesy of Essentialism) arise. And since one’s essence is innate, innateness ought to be critical for determining afterlife-persistence. In particular, if the deceased maintains innate properties of the living, then the dead and the living ought to be one and the same. But, as shown next, the evaluation of kind membership conflicts with Dualism.

- c. *Essentialism promotes embodiment intuitions.* Dualism, recall, suggests that a person’s mind can outlive its body. Yet, when people evaluate essence (which guides kind membership), it is the *body* which is paramount (e.g., Newman & Keil, 2008). Essence, then, might be viewed as embodied (for review, Berent, 2021c).

In line with the hypothesis of “embodied essence,” children describe the inherited essence as a “tiny piece” of matter (Springer & Keil, 1991). Children believe that the essence of living things resides in the creature’s “insides” (Gelman & Wellman, 1991), that it is localized at the center of the organism (Newman & Keil, 2008), and that

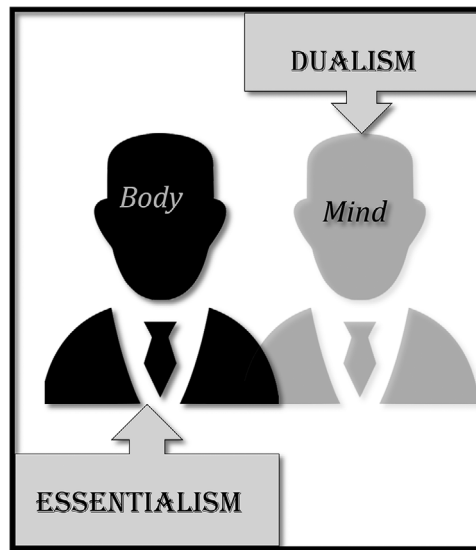


Fig. 1. Schematic depiction of the constraints on the afterlife. Per Dualism, the ethereal mind can thus outlive the body; Essentialism, however, aligns the person's core with their hidden essence, anchored in the body.

it must further correspond to some specific biological substance (e.g., blood: Sousa, Atran, & Medin, 2002; Waxman, Medin, & Ross, 2007). Size, physical location, and bodily substance are all properties of living bodies. These results, then, suggest that one's essence is considered embodied.

Further support for this hypothesis is presented by recent studies suggesting that traits that are embodied are considered more likely to be innate and immutable compared to ones that lack a clear link to the body (Berent, Barrett, & Platt, 2020; Berent et al., 2021). For example, people believe that emotions that can be readily identified in a person's face are more likely to be recognized universally (Berent et al., 2020). People are also more likely to essentialize sensorimotor traits (i.e., traits that are readily embodied, such as *walking*) compared to epistemic traits (i.e., traits that lack a clear alignment to the body, such as *knowing what is an object*; Berent, Platt, & Sandoboe, 2019; Berent et al., 2021). Moreover, the link between embodiment and essentialist reasoning is causal: when offered evidence that psychological traits are embodied (e.g., in the brain), people are more likely to consider them as innate (Berent et al., 2020; Berent & Platt, 2021a; Berent & Platt, 2021b; Berent et al., 2021). Finally, people consider the link between essence and embodiment as bidirectional: not only do they consider embodied traits as innate, but they also assume that traits that are innate are embodied (Berent et al., 2021).

- d. *Dualism and Essentialism collide.* Summarizing, then, reasoning about afterlife persistence is subject to two conflicting considerations (Fig. 1). Dualism mandates that only the ethereal mind *can* persist; Essentialism, however, states that, to maintain its kind, a living thing *must* preserve their essence, and that essence is inborn and embodied.

Dualism, then, allows for the persistence of the mind, whereas Essentialism prioritizes innate aspects of the body.

I suggest that these two conflicting constraints are violable. The resolution of the conflict, then, depends on how people rank those constraints. If people put greater weight on Dualism, then supernatural beings will be viewed as utterly ethereal (contrary to Essentialism); if they put greater weight on Essentialism, then such beings will exhibit some bodily properties, especially those that are innate. A birthmark, then, can be indicative of reincarnation (White, 2015), and it ought to be more diagnostic than a scratch.² And of course, reasoning about the supernatural can be further constrained by additional intuitive beliefs, such as agency, anthropomorphism, and intuitive physics, as well as beliefs that arise from formal education.

The proposal that Dualism is a violable constraint that interacts with Essentialism explains the conflicting facets of afterlife reasoning as follows. First, the tension between Dualism and Essentialism explains why supernatural beings are often seen as chimeras of ethereal and bodily properties (for review, Barlev & Shtulman, 2021) and why transference to the afterlife often requires some appropriate physical vessel (e.g., a plant or stone; Cohen & Barrett, 2008). Specifically, if supernatural beings are partly embodied, then their trajectory to the afterlife ought to require physical contact—this is only expected by intuitive physics (Spelke, 1994). Second, and critically, this proposal explains the tension between the apparent universality of the concern with the mind–body divide, on the one hand, and the unquestionable diversity that is evident in reasoning about the supernatural, on the other hand. Dualism and Essentialism, then, could be universal; diversity might arise from the resolution of these conflicting pressures (among others). This proposal does not directly speak to the third challenge from the role of learning (Shtulman, 2008), but the possibility that children learn about Dualism does not necessarily conflict with innateness and universality; learning would only be problematic if Dualism lacked an innate universal basis.

1.2. *How to tell a dualist*

The framework advanced here carries several implications that generate novel testable predictions.

- a. *Intuitive Dualism is potentially universal.* In the present framework, Dualism could well be universal. Indeed, Dualism is demonstrably linked to two putatively innate systems of core knowledge—intuitive physics and theory of mind (Berent, 2023; Berent, Theodore, & Valencia, 2022; Bloom, 2004). Whether Dualism is, in fact, universal cannot be settled here. Instead, I seek to show why this possibility is entirely consistent with its diverse manifestations and people's explicit statements to the contrary.
- b. *Dualism is a violable constraint.* Discrepancies between tacit Dualism and explicit statements arise because Dualism is a violable constraint. Recall (from the coffee example) that people routinely violate constraints that they evidently hold: many people would like to save, yet they overspend on their coffee to satisfy “taste.” The same holds for Dualism: Dualism may be violated to satisfy conflicting constraints,

such as Essentialism. Thus, regardless of whether people endorse an ethereal afterlife, deny it, or believe in some chimeric existence, people could still be “closet dualists”: they might consider the mind as ethereal, distinct from the body.

- c. *Dualism—Essentialism interactions.* One constraint that frequently interacts with Dualism is Essentialism. This interaction arises because Essentialism informs the evaluation of kind membership (e.g., is a being in the afterlife the same person as the living?), and like Dualism, Essentialism tracks embodiment. Embodiment, however, is weighed differently by the two constraints. Dualism can disregard the body, whereas, for Essentialism, the body is paramount.
- d. *Body or mind? It depends!* The outcome of such interactions between Dualism and Essentialism can further vary according to task demands. Situations that target the mind (e.g., afterlife) prioritize the persistence of the mind, whereas situations that target the body (e.g., a body-replication scenario) could favor the persistence of the body.

Furthermore, for the dualist, some psychological traits (e.g., thoughts) seem ethereal, distinct from the body; other traits may be more readily linked to a specific body organ (e.g., walking~ legs). Thus, the persistence of a trait depends on the perception of both (a) its inherent embodiment; and (b) the situation in question. Dualism predicts that traits perceived as relatively ethereal (e.g., thinking) could persist even when the body ceases to exist, whereas embodied traits (e.g., walking) require the body. Which substance—mind or body—is prioritized, then, ought to be strictly context-dependent: it ought to vary, depending on the situation in question.

- e. *How to tell a dualist?* To tell a dualist, then, ask *not* what is the absolute magnitude of one’s judgment (e.g., the proportion of “afterlife” responses) or its dependence on trait types (e.g., are thoughts more likely to persist in the afterlife than feelings, i.e., a main effect). Rather, it is the interaction (of Task $\times$ Trait) that is the hallmark of Dualism.

1.3. *The present research*

The present research has two goals. First, it seeks to determine whether “soft” Dualism plays a tacit role. Second, it examines whether the contribution of Dualism interacts with Essentialism.

To this end, participants were invited to evaluate the same list of psychological traits across two experiments. Experiment 1 elicited judgment of embodiment (will a trait emerge in a replica of one’s body?) and disembodiment (will a trait persist in the afterlife, after the body’s demise?)—a task that targets Dualism; Experiment 2 asked participants to evaluate the innateness of the same traits—intuitions which ought to be provided by Essentialism.

Two questions are of interest: (a) is performance on each experiment modulated by the targeted constraint—that is, do participants in Experiment 1 show evidence of Dualism, and in Experiment 2, of Essentialism (as detailed below)? Second, and critically, is performance on each task also modulated by the **competing** constraint—a constraint that is not directly relevant to the task at hand? That is, are embodiment judgments (in Experiments 1) constrained by the innateness of psychological traits, and are innateness intuitions (in Experiment 2) constrained by the perceived embodiment of those traits?

2. Experiment 1: Replication and afterlife

Experiment 1 examined laypeople's intuitions about the embodiment of psychological traits. To this end, participants were invited to evaluate the emergence of these traits in two scenarios. In one scenario, participants were asked to evaluate whether the trait would likely emerge in the afterlife, after the demise of a person's body—this is a test of *disembodiment*. A second task evaluated the converse, *embodiment*. Here, participants were asked to imagine it were possibly to create a replica of a person's body; their task was to determine whether the traits in question would emerge in the body replica.

Each psychological trait, in turn, depicted a contrast. Epistemic traits depicted knowledge of the difference between two concepts—either ones that are plausibly innate (e.g., knowing the difference between “animate” and “inanimate” things), or ones that are obviously learned (e.g., knowing the difference between Paris and London). Sensorimotor and affective traits, in turn, featured a contrast between two feelings or actions/sensations—either ones that are plausibly innate (e.g., feeling happy, as opposed to sad; being able to sit, as opposed to walk), or ones that are learned (e.g., being able to play the piano, as opposed to the violin). Participants were asked to evaluate whether each such trait is likely to emerge in the relevant situation—either in the afterlife, or in a replica of one's body.

Per Dualism, the likelihood that a trait would emerge should depend on its (a) perceived embodiment and (b) the situation in question. For the dualist, thoughts might seem ethereal, distinct from the body (e.g., Berent et al., 2021; Bering & Bjorklund, 2004), whereas sensorimotor (e.g., walking) and emotive traits (e.g., happiness) seem readily anchored in the body (e.g., in the legs and face, respectively). So, when presented with the afterlife, a situation where the body no longer exists, a dualist may still consider thoughts as more likely to persist (relative to affective/sensorimotor traits).

In contrast, when considering body replication, here, the preference for epistemic traits should be clearly reduced, and possibly, reversed (i.e., a preference for affective/sensorimotor traits). The precise outcome is difficult to predict a priori, as the body-replication scenario is open to different interpretations. While the task instructions expressively state that the body is maintained, they are silent about the fate of the mind, leaving open the possibility that it could persist. Body replication, then, could present a less radical transformation than the afterlife (where the body clearly perishes). For this reason, in the afterlife scenario, concerns about kind membership might be particularly pressing. And since (per Essentialism) innate traits are more likely to preserve the person's kind, innateness might play a greater role in the afterlife task (relative to the body-replication scenario).

3. Methods

3.1. Participants

Thirty participants (15 males; 15 females) took part in the experiment. All participants were Prolific workers who were paid for their participation; they were native English speakers who were reportedly neurotypical and, free of language or reading disorders. Their mean age was

35.8 years ($SD = 11.67$). Twelve participants reported that their highest level of completed education was high school or an associate degree, 15 had a bachelor's degree, and six had a graduate degree. Most participants ($N = 13$) likely resided in the UK, six in Canada, four in the United States, two in South Africa, and the remaining three in Israel, Mexico, and New Zealand (residence was inferred from IP Addresses).

The sample size was determined based on previous related research using the same tasks (Berent et al., 2021; Berent et al., 2022). All procedures in this research were reviewed and approved by the Institutional Review Board at Northeastern University; all participants electronically signed an informed consent form.

3.2. Materials

The materials consisted of 48 word-pairs corresponding to the psychological traits of humans (see online Appendix I). Each such trait featured a contrast between two concepts. Half of the concepts captured epistemic traits— notions that people know; the other half captured sensorimotor capacities and emotions.

Each trait type (epistemic or not) was either obviously learned (e.g., swim/drive; Paris/London) or plausibly innate (e.g., sit/walk; animate/inanimate). Informed by past research (Berent et al., 2020), it was further hypothesized that “basic” emotions (e.g., happy/sad) would be likely considered innate, whereas nonbasic emotions (e.g., jealousy) would be more likely considered learned. Each such trait was presented in a manner that explicitly defined whether it concerns knowledge, actions/sensations, or emotion.

For example, innate epistemic traits included *Knowing the difference between “animate” and “inanimate,”* and *Knowing the difference “object” and “person”*; learned epistemic traits included *Knowing the difference between Paris and London,* and *Knowing the difference between “fork” and “knife”*; innate sensorimotor/affective traits included *Feeling “angry,” as opposed to “pleasant,”* and *Feeling “disgust,” as opposed to “like”*; learned sensorimotor/affective traits included *Being able to drive (as opposed to fly),* and *Being able to bike (as opposed to sprint).*

Each trait was presented in two tasks: replication and afterlife (counter-balanced for order); within each task, the order of all 48 traits ($2 \text{ innate/learned} \times 2 \text{ epistemic/nonepistemic}$) was randomized.

3.3. Procedure

Participants were told that in the experiment, they will be presented with various psychological traits, concerning what a person knows, feels, and how they can act. Their task was to determine whether those psychological traits would emerge in a replica of that person's body (in the body-replication task) or after the person dies (in the afterlife task).

In the body-replication scenario, participants were invited to imagine it was possible to grow a replica of the human body. The replica, they were told, would be identical to the human donor, and preserve all aspects of the donor's brain. The afterlife task invited participants to assume that, when people die, they would continue to exist in some capacity. Participants were told that they are about to see the psychological traits of a person. Participants were

asked to indicate “will the following traits of the donor emerge in the replica/afterlife” using a binary (yes/no) response (for the full instructions, see online Appendix II).

4. Results and discussion

Trial-level responses (will not emerge = 0, will emerge = 1; 30 participants $\times$ 48 traits $\times$ 2 task = 2880 data points) were submitted to a generalized linear mixed effects model with the binomial response family as implemented with the `glmer` function of the `lmer4` package (Bates, Mächler, Bolker, & Walker, 2015). The omnibus model included fixed effects of task (afterlife = -0.5 , replication = 0.5), trait (epistemic = -0.5 , nonepistemic = 0.5), innateness (learned = -0.5 , innate = 0.5), and all interactions. The random effects structure consisted of random intercepts by subject, random slopes for all factors by subjects, and random intercepts by item. The model syntax is: $\text{response} \sim \text{task} * \text{trait} * \text{innateness} + (\text{trait} + \text{innateness} + \text{task} | \text{subject}) + (1 | \text{item})$.

As noted, the likelihood of emergence ought to vary systematically, depending on the trait (epistemic vs. nonepistemic) and task (replication vs. afterlife). To evaluate these predictions, I first asked which traits are more likely to emerge. To gain further insights as to whether participants indeed believed these traits *would* persist, I next compared the mean decision for these traits against chance.

4.1. Which traits are more likely to emerge?

The omnibus model yielded a significant interaction of Trait $\times$ Task ($\beta = 1.15$, $SE = 0.25$, $z = 4.54$, $p < .001$). There was also a significant effect of Innateness ($\beta = 0.88$, $SE = 0.28$, $z = 3.20$, $p < .01$), as well as a significant interaction of Innateness $\times$ Task ($\beta = -0.58$, $SE = 0.24$, $z = -2.40$, $p = .01$). No other effects were significant (all $p > .09$).

The interaction was next explored with planned contrast comparisons as implemented in the `emmeans` package (Lenth, Singmann, Love, Buerkner, & Herve, 2018) using the Tukey method for correction for multiple comparisons.

The significant Trait $\times$ Task interaction (Fig. 2) showed that, when participants evaluated the afterlife, they considered epistemic traits (e.g., knowledge of good/bad; Paris/London) as more likely to emerge than sensorimotor/affective traits ($\beta = 1.28$, $SE = 0.44$, $z = 2.91$, $p = .02$). This, however, was not the case when the same traits were evaluated in the context of the body-replication scenario ($Z < 1$).

As noted, the omnibus analysis also yielded a significant main effect of Innateness, as well as a significant interaction of Innateness $\times$ Task (Fig. 3). Tukey Honest Significant Difference (HSD) tests indicated that, in the afterlife task, innate traits were considered more likely to emerge than learned traits ($\beta = 1.17$, $SE = 0.30$, $z = 3.90$, $p < .001$). This, however, was not the case in the replication tasks ($\beta = 0.59$, $SE = 0.30$, $z = 1.96$, $p = .20$). No other contrasts were significant ($p > .20$). Thus, persistence in the afterlife is informed by innateness.



Fig. 2. Proportion “will emerge” responses as a function of trait and task. Means reflect empirical grand means calculated over by-subject averages; error bars indicate standard error of the mean.

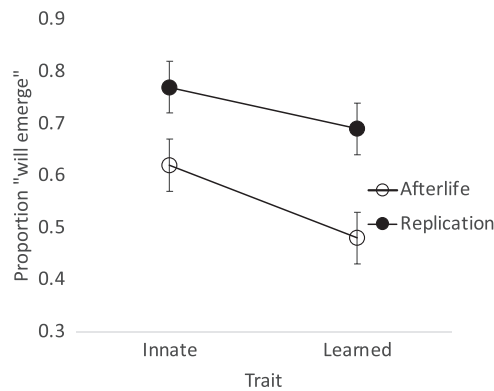


Fig. 3. Proportion “will emerge” responses as a function of innateness and task. Means reflect empirical grand means calculated over by-subject averages; error bars indicate standard error of the mean.

4.2. Will the trait emerge?

To determine whether participants categorically asserted that psychological traits *will* emerge in the replication and afterlife scenarios, I next examined whether mean “will emerge” responses differed from chance for the eight cells formed by crossing task, trait type, and innateness. Given the 2AFC task (i.e., 0 = will not emerge, 1 = will emerge), chance performance is defined as 0.50 proportion “will emerge” responses. Grand means (calculated over by-subject means) for these cells are shown in Fig. 4; data in each cell were tested against chance by testing the intercept against 0.50 in a mixed effects model that predicted “will emerge” decisions from random slopes by subjects and by items.

In the body-replication task, participants considered sensorimotor/affective traits as likely to emerge, regardless of whether they were innate ($\beta = 3.20$, $SE = 1.02$, $z = 3.15$, $p < .01$) or learned ($\beta = 1.46$, $SE = 0.46$, $z = 3.19$, $p < .01$). Epistemic traits, by contrast, were considered likely to emerge only when they were innate ($\beta = 3.52$, $SE = 1.21$, $z = 2.90$, $p < .01$);

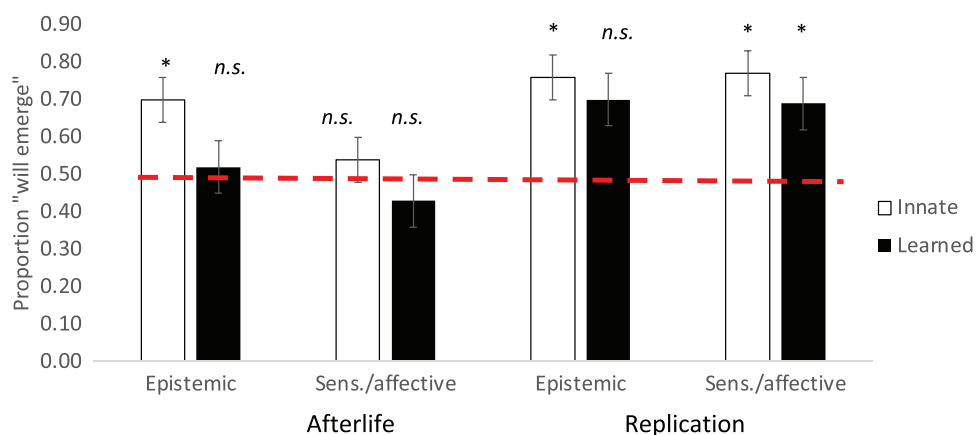


Fig. 4. Proportion “will emerge” responses as a function of trait, innateness, and task. The dotted line indicates chance performance; asterisks indicate significant differences from chance. Means reflect grand empirical means calculated over by-subject averages; error bars indicate standard error of the mean.

responses to learned traits did not significantly differ from chance ($\beta = -0.48$, $SE = 0.69$, $z < 1$).

Moving to the afterlife task, here, ratings of sensorimotor/affective traits did not differ from chance (for innate traits: $\beta = 0.37$, $SE = 0.48$, $z < 1$; for learned traits: $\beta = -0.48$, $SE = 0.69$, $z < 1$), and this was also the case for learned epistemic traits ($\beta = 1.96$, $SE = 1.93$, $z = 1.02$, $p > .30$). Innate epistemic traits, by contrast, were rated significantly above chance ($\beta = 1.64$, $SE = 0.54$, $z = 3.00$, $p < .01$).

Thus, in the afterlife task, participants only endorsed the persistence of innate epistemic traits. In the body-replication task, by contrast, participants endorsed the persistence of all traits *except* for those that were epistemic and learned.

5. Discussion

Experiment 1 asked two questions. First, are people dualists—do they consider the mind as ethereal, distinct from the body? Second, does the putative effect of intuitive Dualism interact with Essentialism? Here, we review the results of Experiment 1 with respect to these questions.

5.1. Role of Dualism

Experiment 1 showed that people consider epistemic traits as relatively disembodied. When asked to consider the afterlife—when the body ceases to exist, people believed that epistemic traits (knowledge of good/bad) are more likely to persist (relative to sensorimotor/affective traits, e.g., walking/sitting). Furthermore, when considering whether a given trait would in

fact emerge (i.e., above chance), only innate epistemic traits were considered likely to persist in the afterlife.

This was not because epistemic traits were considered inherently likely to persist. Indeed, when participants evaluated a body-replication scenario, here, epistemic traits were no longer prioritized (relative to sensorimotor/affective traits). Still, when contrasted with chance level, learned epistemic traits were once again not reliably likely to emerge.

The selective pattern of persistence, depending on whether the task preserves the body (body replication) or does not (afterlife), suggests that epistemic traits were more amenable to persist in the afterlife because they were considered *disembodied*. This is precisely what Dualism predicts.

Still, Dualism further predicts that, in the body-replication task, nonepistemic traits should be *more* likely to persist—a prediction repeatedly borne out in past research (e.g., Berent, 2021a; Berent, 2023; Berent et al., 2021; Berent et al., 2022), but not in Experiment 1. This anomaly could have arisen because, in past research, participants evaluated a single trait (e.g., happiness), whereas Experiment 1 featured a contrast, such as “feeling happy, as opposed to angry.” Accordingly, Experiment 1 invited participants to consider not merely “feeling” (a nonepistemic state) but further, the epistemic ability to contrast between these two emotions. And since epistemic capacities seem disembodied, participants might have been reluctant to assume they would emerge in the body replica. This discrepancy between Experiment 1 and the previous published research, then, might arise for methodological reasons, rather than from the limits of Dualism.

Dualism alone, however, nonetheless cannot account for the entire set of results. In particular, Dualism fails to explain why the emergence of traits also depended on their innateness—why innate traits were more likely to persist in the afterlife than learned traits. Another challenge to Dualism is presented by the finding that, when compared against chance, epistemic traits were likely to persist only when they were innate (but not learned), and this was the case across tasks. The challenge for Dualism is to explain why innateness boosted the persistence of epistemic traits.

5.2. *The role of Essentialism*

The hypothesis that Essentialism interacts with Dualism presents an answer to these puzzles. As noted, transformations to a person raise questions of kind membership—whether the transformed person and the original are one and the same. And reasoning about natural kinds is guided by Essentialism (Gelman, 2004).

Essentialism mandates that, to remain “the same,” the transformation must maintain a person’s essence, which is innate and embodied (for review, Berent, 2021c). Accordingly, innate traits are particularly informative of one’s essence/kind: if one’s innate traits are maintained, then the person persists. Essentialism, then, explains why, in both tasks, innate traits are considered more likely to persist.

Concerns with kind membership, however, are particularly pressing in the afterlife task, as the afterlife explicitly obliterates the body, whereas the body-replication task does not

explicitly obliterate the mind. For this reason, the effect of innateness (courtesy of Essentialism) is stronger in the afterlife- (relative to the body-replication) task.

Still, the concern with innateness further varied by trait. This result is explained by the interaction of Dualism and Essentialism.

Consider first the afterlife. Essentialism, as noted, prioritizes the persistence of innate traits. Per Dualism, however, only epistemic traits could plausibly persist in the afterlife (as only epistemic traits are disembodied), so it is for epistemic (but not affective/sensorimotor) traits that innateness (i.e., Essentialism) “counts.”

In contrast, the body-replication task allows for embodied, sensorimotor/affective traits to persist, regardless of innateness. The weaker concerns with innateness could have emerged either because the body-replication task raised less pressing concerns with kind membership or because embodied traits are inherently prone to be essentialized (relative to disembodied ones; for review, Berent, 2021c).

Thus, the interaction of Dualism with Essentialism can explain (a) why innateness played a role; (b) why its role was greater in the afterlife task; (c) why across tasks, epistemic traits only persisted if they were innate; and (d) why, in the body-replication task, sensorimotor tasks invariably persisted, irrespective of whether they were innate or learned.

Of note, the present conclusions agree with the previous proposal that reasoning about the supernatural is constrained by Essentialism (Richert & Harris, 2008). But the trait $\times$ task interaction makes it clear that the essence lies not in the ethereal soul/mind but rather in innate aspects of the body.

5.3. *Dualism is violable*

The interactions between Dualism and Essentialism are unexpected by the view of Dualism as a violable rule. Had Dualism been absolute and inviolable, then all epistemic traits should have persisted in the afterlife; innateness should not have played a role in the afterlife, nor should it have modulated persistence in the body-replication scenario. Categorical Dualism is thus inconsistent with the present results. But so is pure Physicalism. If people were Physicalists, then they should have singlehandedly rejected the afterlife, and innateness should not have played any role. This prediction is not borne out either. Thus, the hypothesis that Dualism is a soft, violable constraint that interacts with Essentialism uniquely accounts for the results.

The support for Essentialism, however, is indirect. While Essentialism can certainly explain why innate traits are favored, the present results offer no direct evidence that participants indeed perceive putatively “innate” traits as such. Likewise, there is no evidence that the sensorimotor/affective traits used in this study are perceived as innate (more so than learned traits).

At a broader level, the account advanced here entails that Dualism and Essentialism trade the same currency—these computations are both informed by embodiment intuitions. If so, then embodiment intuitions (courtesy of Dualism) ought to affect nativist judgments (courtesy of Essentialism), just as Essentialist intuitions modulated embodiment judgments (in Experiment 1). Experiment 2 tests this prediction.

6. Experiment 2: Innateness intuitions

Experiment 2 examines whether the perceived embodiment of psychological traits indeed promotes nativist intuitions—courtesy of Essentialism.

If people consider one's innate essence as embodied, then traits that are perceived as embodied ought to be considered as more likely to be innate. And, given past research (Berent et al., 2020; Berent & Platt, 2021b; Berent et al., 2021; Sandoboe & Berent, 2021; Weisman et al., 2021) and the results of Experiment 1, embodiment intuitions ought to be stronger for sensorimotor and affective traits relative to epistemic traits. Accordingly, nativist intuitions should be stronger for sensorimotor/affective traits (relative to epistemic ones).

7. Methods

7.1 Participants

Thirty participants (15 males, 15 females) took part in Experiment 2. Participants were Prolific workers, defined as in Experiment 1. Their mean age was 35.86 years ($SD = 12.06$). Most participants ($N = 20$) likely resided in the UK, four in Canada, four in the South Africa, and two in New Zealand (residence was inferred from IP Addresses). Due to a programming error, education level was not collected in this experiment.

The materials and procedure were as in Experiment 1, with the exception that participants were now asked to evaluate whether these traits are inborn or learned. Participants were told that some of the traits they were about to see are learned from experience (e.g., the contrast between Boston and Cleveland). Other traits, such as the contrast between walking and sitting, are possibly inborn—these might be genetically based, and it is likely that children might show them even if they have had no chance to learn them from others (“innateness” is referenced by the term “inborn,” to avoid the irrelevant social-protectionist connotations of “nativism”). Participants were asked to decide whether the distinction is learned or inborn (for the full instructions, see online Appendix III). All traits were randomized.

8. Results

Trial-level responses (learned = 0, inborn = 1; 30 participants $\times$ 48 traits = 1440 data points) were submitted to a generalized linear mixed effects model with the binomial response family as implemented with the `glmer` function of the `lme4` package (Bates et al., 2015). The omnibus model included fixed effects of trait (sensorimotor/affective = -0.5 , epistemic = 0.5), innateness (learned = -0.5 , innate = 0.5), and all interactions. The random effect structure consisted of random intercepts by subject, random slopes for all factors by subjects, and random intercepts by item. The model syntax is as follows: `response ~ trait* innateness + (trait + innateness | subject) + (1 | item)`.

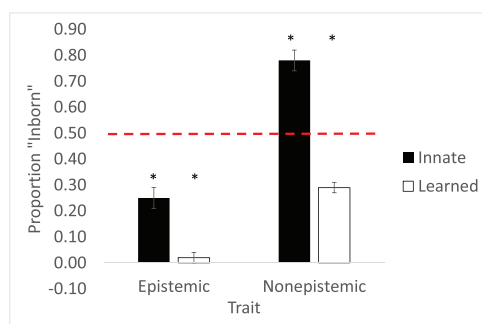


Fig. 5. *Innateness intuitions*. Proportion “inborn” responses as a function of trait and innateness. The dotted line indicates chance performance; asterisks indicate significant differences from chance. Means reflect grand empirical means calculated over by-subject averages; error bars indicate standard error of the mean.

As in Experiment 1, I first evaluate which traits are more likely to be seen as innate by probing for the effects of trait characteristics. To determine whether participants indeed considered these traits as innate, I next compared the mean responses against chance.

8.1. Which traits are more likely to be perceived as innate?

As expected, the logit model yielded a significant effect of Innateness ($\beta = 5.64$, $SE = 0.90$, $z = 6.24$, $p < .001$), as traits classified as plausibly innate were also more likely to be viewed as such by participants (compared to traits classified as learned). Critically, there was a significant effect of Trait ($\beta = -4.61$, $SE = 0.95$, $z = -4.86$, $p < .001$), as sensorimotor/affective traits (e.g., being able to walk/sit) were considered more likely to be innate than epistemic traits (e.g., knowing the difference between good/bad). The interaction was not significant ($Z < 1$).

8.2. The innateness of psychological traits

To further determine whether those different trait types were in fact considered innate, I next contrasted the mean innateness responses for the four trait types (Epistemic vs. Sensorimotor/affective $\times$ Innate/learned) against chance, following the methods outlined for Experiment 1.

Results (see Fig. 5) showed that the sensorimotor/affective traits I classified as innate were indeed considered innate by participants ($M = 0.78$, $\beta = 2.35$, $SE = 0.59$, $z = 3.97$, $p < .001$). As expected, traits classified as learned were also considered as such by participants, as their perceived innateness was significantly lower than chance, regardless of whether they were epistemic ($M = 0.02$, $\beta = -6.78$, $SE = 2.29$, $z = -2.30$, $p < .01$) or sensorimotor/affective ($M = .29$, $\beta = -5.07$, $SE = 2.33$, $z = -2.18$, $p = .03$). Participants did not consider putatively innate epistemic traits as such; in fact, participants asserted that these traits are learned (i.e., they were rated significantly lower than chance: $M = 0.25$, $\beta = -1.74$, $SE = 0.51$, $z = -3.40$, $p < .001$).

9. Discussion

Experiment 2 further evaluated dualist intuitions and their interactions with Essentialism. Results showed that sensorimotor and affective traits were considered more likely to be innate than epistemic ones (e.g., good/bad). Moreover, when compared against chance, people positively endorsed the innateness of sensorimotor/affective traits that are plausibly innate (e.g., sit/walk), whereas, as expected, they denied the innateness of sensorimotor traits that are patently learned (e.g., driving/flying).

Remarkably, people also denied the innateness of epistemic traits that are plausibly innate, such as the distinction between animate/inanimate things—a trait evident in young infants (Kominsky, Li, & Carey, 2022; Setoh, Wu, Baillargeon, & Gelman, 2013) and nonhuman animals (Rosa Salva, Mayer, & Vallortigara, 2015). These results are in line with the empiricist bias, documented in past research (Berent et al., 2019; Berent et al., 2021; Wang & Feigenson, 2019).

Why epistemic traits were not considered innate, is, of course, an open empirical question. Taken at face value, empiricist intuitions can arise for many reasons. For example, it is possible that participants are unlikely to view epistemic traits as innate because of their own learning experience (e.g., in school). People could further resist innateness because they are concerned that it might undermine free will and social justice (Pinker, 2002). Each of these factors could, no doubt, play a role. Informed by past research, however, one might expect intuitions about innateness to be further constrained by tacit Dualism (Berent, 2023; Berent et al., 2020; Berent & Platt, 2021a; Berent & Platt, 2021b; Berent et al., 2021; Berent et al., 2022).

Per intuitive Dualism, sensorimotor/affective traits are perceived as inherently embodied (as shown in Experiment 1). Since, per Essentialism, embodiment is indicative of innate essence, embodiment promotes innateness intuitions. If so, innateness intuitions (in Experiment 2) ought to correlate with perceived embodiment (in Experiment 1). And given that epistemic and sensorimotor/affective traits differ with respect to their perceived innateness and embodiment, we might expect them to exhibit a different pattern of correlations. Accordingly, these correlations are evaluated by trait type.

For epistemic traits (Fig. 6), innateness indeed correlated positively with the emergence of the trait—the more strongly the trait was essentialized (i.e., more likely to be considered innate), the more likely it was to emerge in both the body replication ($r(22) = .496, p = .01$) and the afterlife task ($r(22) = .823, p < .001$).

Innateness likewise correlated with the emergence of sensorimotor-affective traits in the afterlife ($r(22) = .495, p = .01$). However, this correlation was not significant in the body-replication scenario ($r(22) = .225, p > .30$). This null effect likely emerged because many of these learned traits are strongly anchored in the body (e.g., biking/sprinting; flying/swimming), so they tend to be essentialized. For this reason, such traits are considered likely to emerge in the body replica even if they are clearly learned. For the remaining categories, however, intuitions regarding the mind–body divide strongly correlated with innateness intuitions. Altogether, then, the findings of Experiment 2 are in line with the hypothesis

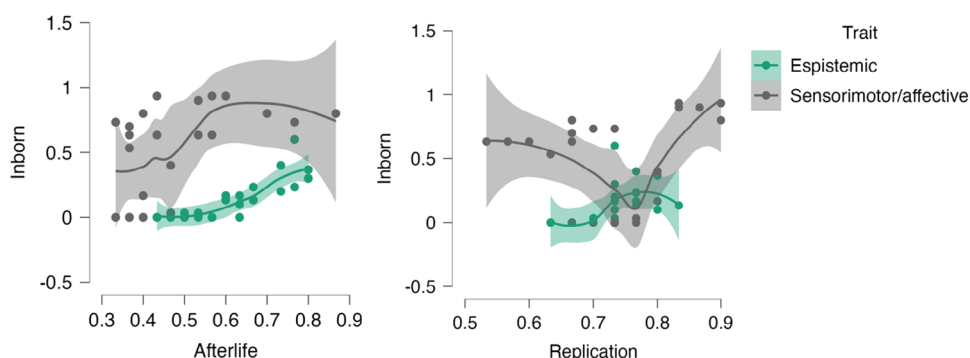


Fig. 6. Association between by-item (i.e., trait) mean proportion “inborn” responses in Experiment 2 and mean proportion “will emerge” for the body-replication and afterlife tasks, in Experiment 1. Circles indicate individual items, the line indicates the best fit, and the shaded region indicates the 95% confidence interval for the line of best fit.

that Dualism and Essentialism interact, as they both trade a common currency: embodiment intuitions.

10. General discussion

People exhibit conflicting intuitions about bodies and minds. On the one hand, people readily contrast minds and bodies, and beliefs in supernatural beings and the afterlife are prevalent across cultures (e.g., Barlev & Shtulman, 2021; Bloom, 2004; Boyer, 2018). Yet, these supernatural creatures are often seen as chimeric, rather than utterly ethereal, and the endorsement of afterlife is hardly absolute (Barlev & Shtulman, 2021; Barrett et al., 2021).

I suggest that these conflicting facets of Dualism arise because Dualism is a soft violable constraint that interacts with other intuitive (and formal) constraints. Two experiments evaluated the interaction between Dualism and Essentialism.

Experiment 1 examined the persistence of psychological traits in a scenario that either highlights the body (body replication) or its demise (in the afterlife). Results showed that persistence responses varied systematically and selectively, depending on the embodiment demands of the task (replication vs. afterlife) and the putative embodiment of the trait. Epistemic traits (e.g., knowing the distinction between good/bad) were considered more likely to emerge in the afterlife (relative to affective/sensorimotor traits), but not in a body-replication situation. These observations are in line with Dualism.

Dualism alone, however, fails to explain why innate traits were more likely to emerge in the afterlife (than learned ones). This pattern, then, is attributed to Essentialism. Essentialism is invoked to determine kind membership—whether the transformed being and the original are still the same. Since the afterlife transformation is arguably more radical than body replication (as afterlife obliterates the body, but body replication does not obliterate the mind), the concerns with kind (hence, with one’s innate, embodied essence) are particularly pronounced

for afterlife judgments. Essentialist intuitions, then, inform mind–body judgments, courtesy of Dualism.

To evaluate the converse, namely, whether Dualism further constrains judgments of essence, Experiment 2 presented the same traits to innateness judgments (a proxy for essentialist reasoning). Essentialism mandates that what is innate must be embodied, whereas Dualism renders the mind disembodied. Accordingly, people should be reluctant to consider epistemic traits as innate. In line with this prediction, epistemic traits were less likely to be essentialized (compared to sensorimotor/affective traits)—they were considered less likely to be innate, and when considered in absolute terms, people denied the innateness of epistemic traits, but endorsed the innateness of sensorimotor/affective ones. Moreover, embodiment judgments (in Experiment 1) and innateness responses (in Experiment 2) correlated.

These interactions of Dualism and Essentialism can further explain why it is the case that creatures in the afterlife are sometimes perceived as chimeric—as partly ethereal, and partly embodied (for review, Barlev & Shtulman, 2021). Although the present experiments did not document such chimeric intuitions, as afterlife beings were not reliably judged as possessing any sensorimotor/affective (i.e., embodied) traits (i.e., responses to such traits did not exceed chance), afterlife judgments prioritized one’s innate essence (in Experiment 1), and this innate essence was localized in one’s body (in Experiment 2). This interaction can further explain why it is the case that the mind seems readily distinct from the body, yet people are apparently reluctant to accept that minds can exist separately from bodies (Barlev & Shtulman, 2021).

In the present framework of interactive, violable constraints, supernatural chimeras do not disprove intuitive Dualism. Rather, they might reflect the contribution of Essentialism. And since people consider essence as embodied (for review, Berent, 2021c), to persist in the afterlife, one must maintain not only one’s ethereal essence (per Dualism) but also some “essential” aspects of their body (per Essentialism).

The present results are limited in several respects. First, Dualism should have rendered nonepistemic traits more likely to emerge in the body replica, but this was not observed in Experiment 1. This anomaly could have arisen because each trial featured a *contrast* between a pair of concepts (e.g., between happiness and anger), and in so doing, underscored the epistemic aspects of sensorimotor and affective traits (e.g., the differentiation between distinct emotional categories, rather than generic “feeling”). The emphasis on the epistemic attributes of actions, sensations, and emotions could have rendered these traits more ethereal, hence, as less likely to persist in the body replica. This possibility ought to be evaluated in future research.

Second, the present conclusions regarding the role of Essentialism obtain from a single probe that relies on explicit innateness ratings and a particular definition of innateness (presented to participants). As noted, the present results suggest that people identify a person’s innate essence with their body. While this embodied view of essence agrees with much previous research (for review, Berent, 2021c), one previous study has reached the opposite conclusion—that a person’s essence resides in their ethereal soul (Richert & Harris, 2008), as the soul seems to exist before conception and survive death. Whether this discrepancy is due to the different methods of gauging Essentialism or the religious connotations of “soul,”

specifically, is uncertain. Future studies ought to corroborate these conclusions using additional probes.

Finally, the present results are limited inasmuch as they obtain from Western-educated participants and a verbal task that relies on explicit probing; future studies ought to evaluate the cross-cultural generalizability of the findings, and include the use of implicit, and nonverbal tasks (e.g., Chudek et al., 2018).

Notwithstanding these limitations, the present findings make it clear that Dualism is violable, and it interacts with Essentialism. To gauge its role, one might thus need to take a *relativist* approach. Rather than asking whether people categorically endorse the afterlife, one might better ask whether they are *more* likely to do so for traits perceived as disembodied, and whether this pattern of preference changes when the task targets the body—in a body replication.

Whether people are indeed natural dualists is an open empirical question. But a resolution of this debate must consider the possibility that intuitive constraints are violable and interactive.

Note

- 1 I wish to thank Rachel Theodore for her statistical assistance and comment on an earlier draft.
- 2 This prediction distinguishes the present account from the previous proposal of Richert and Harris (2008). As in the present account, Richert and Harris propose that Essentialism guides reasoning about the kind identity of the living and the deceased. But in their view, “essence” is anchored not in the living body but in the disembodied soul. Experiments 1 and 2 directly contrast these proposals.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix I

Appendix II

Appendix III

Supplementary Materials