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Brief article

More dead than dead: Perceptions of persons in the persistent vegetative state

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ABSTRACT

Patients in persistent vegetative state (PVS) may be biologically alive, but these experiments indicate that people see PVS as a state curiously more dead than dead. Experiment 1 found that PVS patients were perceived to have less mental capacity than the dead. Experiment 2 explained this effect as an outgrowth of afterlife beliefs, and the tendency to focus on the bodies of PVS patients at the expense of their minds. Experiment 3 found that PVS is also perceived as “worse” than death: people deem early death better than being in PVS. These studies suggest that people perceive the minds of PVS patients as less valuable than those of the dead – ironically, this effect is especially robust for those high in religiosity.

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1. Introduction

The dead have a certain presence in our perceptions and thoughts, whether they are imagined as ghosts, residents of heaven or hell, or memories. In contrast, a person in a persistent vegetative state (PVS) seems to be popularly understood as having no presence at all—the PVS patient is viewed simply as a body supported by machines, lacking in mental capacities. These competing images suggest that although PVS may fall biologically between life and death, it is possible that PVS patients may be perceived, oddly, as more dead than dead—with lesser mental capacities than the dead. In this research, we explore this possibility and provide an potential explanation: PVS patients could be caught in a limbo that activates neither normal mind perception nor afterlife beliefs.

Vegetative states are anomalous in many ways, and medicine has been engaged in categorizing these states (Laureys, Owen, & Schiff, 2004; Multi Society Task Force

on PVS, 1994). Patients in vegetative states shows no evidence of sustained, reproducible, purposeful, or voluntary behavioral responses to visual, auditory, tactile, or noxious stimuli and no evidence of language comprehension or expression (Jennett & Plum, 1972; Laureys et al., 2004; Schiff, 2006; Zeman, 1997). Vegetative patients are classified as in either a persistent or permanent vegetative state depending on their likelihood of recovery, and other similar but distinct states include the coma and the minimally conscious state (Laureys et al., 2004; Schiff, 2006). This paper focuses on lay perceptions of mind, and so adopts a loose definition of the persistent vegetative state that is consistent with media reports – as the case of someone with permanent incapacitating brain damage, leaving only vegetative functions and with no hope of recovery.

PVS patients have come under medical and public scrutiny because their anomalous mental status has led to an intense debate about their moral rights, such as in the case of Terri Schiavo (Koch, 2005). Some see the practice of keeping alive “helplessly unconscious” patients as unjust because it drains resources from other patients, while others see a moral imperative in keeping such patients alive because of the very ambiguity of their status (Beecher,

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1967; Borthwick, 2005; Jones, 2004). At the center of this debate is whether PVS patients possess moral rights and moral responsibility. Although moral status would seem to hinge on perceptions of biological life, the two concepts are dissociable; in one sample, one-third of people who perceived severely brain damaged patients as technically alive were still willing to donate the patient's organs (Siminoff, Burant, & Youngner, 2004). Instead, moral status hinges on the mental capacities we afford others – upon *mind perception* (Bastian, Laham, Wilson, Haslam, & Koval, in press; Gray, Gray, & Wegner, 2007; Haslam, Loughnan, Kashima, & Bain, 2008; Waytz, Gray, Epley, & Wegner, 2010). Mind perception often depends on objective criteria, but its perceptual nature entails that someone with objectively more mental abilities could actually be seen to have relatively less mind. How could PVS patients be afforded less mind than the dead?

Research suggests that many believe in an immaterial mind or soul that lives on after the death of the body; and even those who do not explicitly endorse these views often attribute mental functioning to the dead (Bering & Bjorklund, 2004; Bering, 2002; Stellar & Rozin, 2009). One reason why people may ascribe mind to the dead is because they conceptualize them as minds rather than bodies. Indeed, research finds that focusing on the body of normal living humans tends to strip them of mind (Archer, Iritani, Kimes, & Barrios, 1983; Heflick & Goldenberg, 2009; Loughnan et al., 2010; Nussbaum, 1995), and the biological nature of PVS patients may similarly lead people to dematerialize them. In other words, PVS patients may be seen as mindless bodies while the dead may be seen as disembodied minds. This hypothesis is consistent with the idea of dualism, effect whereby people view others as *either* minds or bodies (Bloom, 2004; Demertzi, Liew, et al., 2009; Lillard, 1996; Monterosso, Royzman, & Schwartz, 2005). As many religions explicitly endorse such dualistic afterlife beliefs, those high in religiosity may be most likely to see PVS as less than dead – an ironic possibility, since they often strongly defend PVS patients' right to life (Demertzi et al., 2011).

An additional consequence of PVS being seen as a state with less mind than death is that PVS could be seen as less desirable than death. From a biological point of view, neither the dead nor PVS patients are aware of their state, but perceptually, people could see PVS as a worse state than death. This would also be an ironic finding, since significant resources are often expended to keep PVS patients from dying.

These experiments examined the anomalous character of the persistent vegetative state: whether those in PVS are ascribed less mind than the deceased (Experiment 1), whether dualism and religiosity contribute to these perceptions (Experiment 2), and whether people evaluate PVS as a worse fate than an early death (Experiment 3).

2. Experiment 1: a state less than dead

In this experiment, participants evaluated the mind of a person either in life, PVS, or death. We predicted that the

person in PVS would be seen to have fewer mental capacities than a dead person.

2.1. Method

Participants ($N = 201$, 102 female, $M_{\text{age}} = 23$) were recruited from colleges and metro areas in New England, Amtrak stations and New York City parks. They read a vignette in which the protagonist, David, has a car accident and suffers major injuries. In the *life* condition, he fully recovers; in the *dead* condition, he dies; in the *PVS* condition, he enters a PVS: "David's entire brain was destroyed, except for the one part that keeps him breathing. So while his body is still technically alive, he will never wake up again."

Participants then rated their perception of David's mind by indicating the extent to which he could "influence the outcome of situations," "know right from wrong," "remember the events of his life," "have emotions and feelings," "be aware of his environment," and "have a personality." The questions were answered on a 7-point scale from "-3, Strongly Disagree" to "0, Neither Agree nor Disagree" to "3, Strongly Agree."

To check whether participants were paying attention, at the end of the study, they were asked whether David was "alive," or "alive with significant brain damage," or "dead." Subjects who answered inconsistently with their condition were excluded ($N = 21$). For a complete description of study materials, see [supplementary materials](#).

3. Results and discussion

Responses to the six mind perception questions were averaged to form a mind perception index (Cronbach's $\alpha = 0.95$). This index was submitted to a 3 (State: *life*, *PVS*, *dead*) \times 2 (Sex: female, male) analysis of variance (ANOVA), which revealed a main effect of state, $F(2, 173) = 89.04$, $p < 0.001$, $\eta^2 = 0.50$, but no effect of sex nor an interaction, $F_s < 0.65$, $p > .70$. Fischer's least significant difference (LSD) tests demonstrated that each state condition differed significantly from each other, $p_s < 0.001$. Participants in the *life* condition attributed the most mind to David ($M = 1.77$, $SD = 1.02$), followed by those in the *dead* condition ($M = -0.29$, $SD = 1.76$), and finally by those in the *PVS* condition ($M = -1.73$, $SD = 1.36$). Individual item analyses confirm that participants in the *PVS* condition ascribed less mind on every item, $p_s < 0.001$ (Fig. 1). These results suggest that PVS patients are uniformly perceived to have mental functioning less than that of the dead.

4. Experiment 2: the explanatory power of afterlife beliefs

Although death seems to suggest the termination of mind, people generally believe that mental functioning continues after death (Bering & Bjorklund, 2004). These views may be encouraged by the fact that dead bodies quickly disappear through burial or burning, leaving people free to conceive of the deceased as disembodied minds.

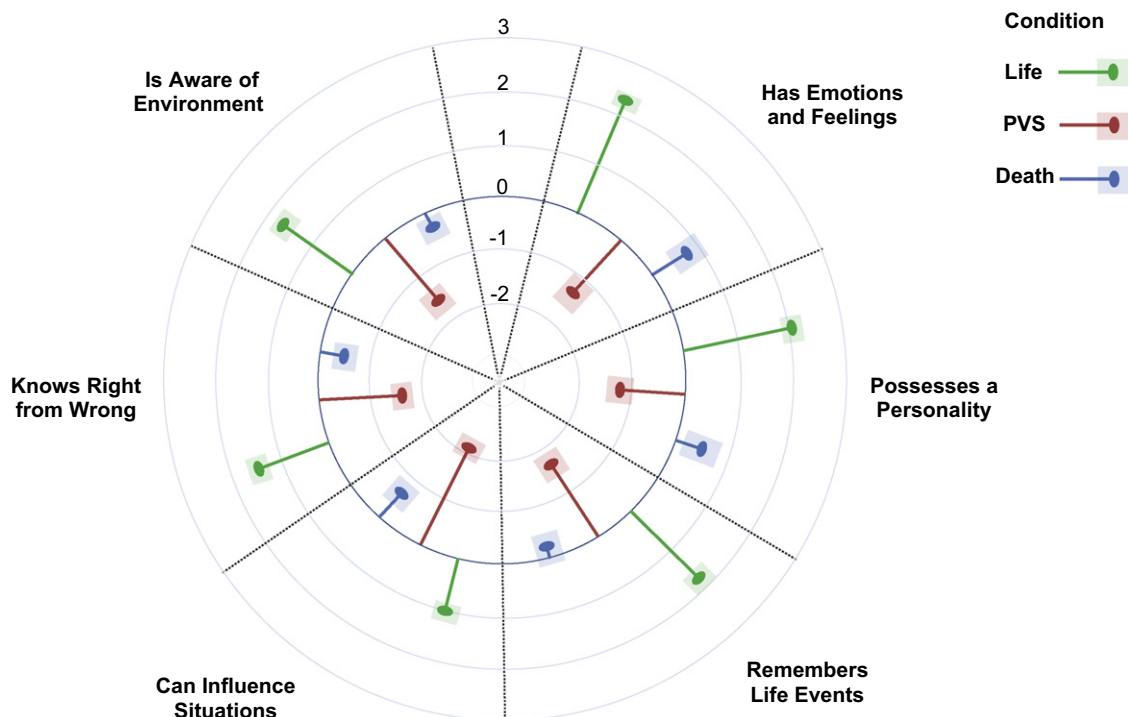


Fig. 1. Perceptions of mind in Experiment 1. Positive numbers refer to agreement with the statement that the target (e.g., a PVS patient) possesses the relative mental state (e.g., is aware of their environment). Negative numbers refer to disagreement. Error boxes are ± 1 S.E.

Alternatively, the bodies of PVS patients are obvious reminders of their mental limitations. If the dead are conferred more mind because of a reduced bodily focus, then framing a dead person as a body (i.e., a corpse) should reduce perceptions of mind – at least for those without explicit views about the survival of the mind after death. For those with strong and explicit beliefs about the soul and its eternal life – those high in religiosity – this manipulation is expected to have no effect, since even corpses suggest to them a disembodied mind, liberated from the body after death.

4.1. Method

Participants ($N = 143$, 69 female, $M_{\text{age}} = 23$) were recruited as in Study 1 and read one of three vignettes. The PVS and dead vignettes were identical to those of Experiment 1. The ending of the corpse vignette focused attention on the body of the dead: “David died on impact. After being embalmed at the morgue, he was buried in the local cemetery. David now lies in a coffin underground.” An independent manipulation check ($N = 25$, 15 female, $M_{\text{age}} = 32$) confirmed that the corpse vignette drew more attention to the body than the standard dead vignette, $t(24) = 6.47$, $p < .001$. This manipulation check also allowed us to confirm that the PVS vignette drew more attention on the body than the disembodied dead vignette, $t(24) = 10.24$, $p < .001$. Measures of mind perception and the general manipulation check were the same as in Experiment 1. Religiosity was measured by assessing agreement with the statement “I am a religious person,” and specific

beliefs about the afterlife were measured by assessing agreement with the statements: “There is life after death”; and “The soul lives on even after a person has died.” Although religiosity and afterlife beliefs represent distinct concepts, they are often closely linked, and many religions explicitly endorse the survival of the soul after death. This link is borne out empirically by the high correlation between the religiosity item and the afterlife items ($r_s > .73$), and so these three questions were averaged to form a religiosity index (Cronbach’s $\alpha = 0.92$). It is important to note, however, that religiosity is generally a much broader concept than afterlife belief.

5. Results and discussion

Descriptive statistics revealed that the religiosity index was not normally distributed, but was bimodal with most people either low or high in religiosity. To represent most clearly these levels, those who answered in the top third of the scale were compared with those who answered in the bottom third. This tertiary split of religiosity not only matches our question, but has also been shown to yield more accurate effects than median splits (Gelman & Park, 2009).

The mind perception index (Cronbach’s $\alpha = 0.92$) was examined in a 3 (State: *dead*, *PVS*, *corpse*) \times 2 (Religiosity: *high*, *low*) \times 2 (Sex: female, male) ANOVA. There were main effects of both state, $F(2, 85) = 8.11$, $p < 0.01$, $\eta^2 = 0.14$, and religiosity, $F(1, 86) = 8.77$, $p < 0.01$, $\eta^2 = 0.08$, which were qualified by the predicted interaction between the two variables, $F(2, 86) = 3.19$, $p < 0.05$, $\eta^2 = 0.06$. There were

no gender effects. Simple effects tests showed significant differences between perceptions of the three states in both the low religiosity group, $F(2, 85) = 2.28, p < 0.05$, and the high religiosity group, $F(2, 85) = 19.30, p < 0.01$.

Planned contrasts revealed that, as in the previous experiment, the PVS patient was seen as having reduced mental capacity relative to the disembodied *dead* person for participants both high and low in religiosity (Figure 2). However, non-religious participants did not ascribe less mind in the PVS condition than in the *corpse* condition, $p > .34$. Emphasizing the body of the deceased allowed non-religious participants to understand death as a state without mind, just as we predicted. Conversely, religious participants ascribed less mind in the PVS condition than in both the *dead* and *corpse* conditions $ps < .01$ (Figure 2). Evidently, religious beliefs allow those high in religiosity to ascribe mind to the dead whether they are conceived as a corpse or as disembodied. These results suggest that afterlife beliefs, both implicit (for the non-religious) and explicit (for the religious), can explain why PVS patients are seen as “more dead than dead.”

6. Experiment 3: is PVS worse than death?

Experiments 1 and 2 suggest that perceptions of PVS patients are anomalous; though the biological functioning of such patients may lie between full functioning and death, they are perceived to have lesser mental capacities than the dead. As mind is perceived to be an essential characteristic of people, both morally and practically (Dennett, 1978; Gray et al., 2007; Zagzebski, 2001), it may be that PVS is seen as a state worse than death. In this experiment, participants imagined that they were in a car accident resulting in either PVS or death and indicated how bad the outcome would be, both for themselves and their family. We asked both questions to address the possibility that PVS is seen as worse only because of its impact on close others. However, we predicted that participants would see PVS as a worse outcome than death for both the for themselves and their family, and that perceptions of mind would be correlated with these evaluations.

6.1. Method

Participants ($N = 55$, 21 female, $M_{\text{age}} = 33$) were recruited from MTurk to take part in an online survey; ten

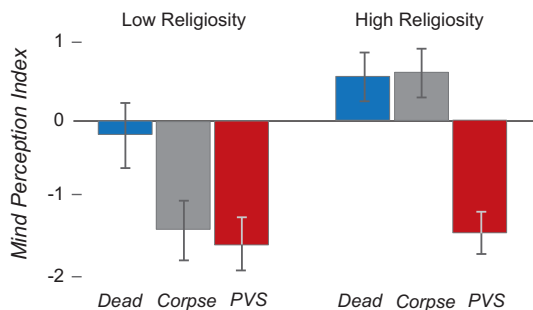


Fig. 2. Mind perceived in targets by low and high religiosity participants (Experiment 2). Error bars are ± 1 S.E.

were excluded for failing the manipulation check. Participants read a brief vignette that asked them to imagine that, sometime in the future, they were involved in a car accident. In the PVS condition, they read that they entered PVS and were not expected to wake up. In the *dead* condition, they read that they had died as a result of the crash. The descriptions of both PVS and death were the same as in Experiment 1, with the addition that insurance was said to pay in full for medical costs/the funeral. This was included to guard against the possibility that PVS was seen as more of a financial burden. Participants evaluated both “How bad would this outcome be for you?” and “How bad would this outcome be for your family?” on a 7-point scale from “Not at all bad” to “Extremely bad.” Participants then rated (as in prior studies) the mental capacities that they would be expected to have after such an outcome (Cronbach’s $\alpha = 0.91$).

7. Results and discussion

An independent samples *t*-test performed on evaluations of PVS and death for the self revealed that participants rated the outcome of PVS to be worse ($M = 4.74, SD = 1.36$) than *dead* ($M = 3.22, SD = 1.41$), $t(43) = 3.67, p < 0.005$. Participants also saw themselves being in a PVS ($M = 5.04, SD = 1.11$) to be a worse outcome than death ($M = 4.00, SD = 1.57$) for their family. As before, participants perceived themselves to have less mind after entering a PVS ($M = -1.51, SD = 1.65$) than after dying ($M = 1.43, SD = 1.75$), $t(43) = 3.86, p < 0.001$, echoing the results of the first two experiments. Correlations confirmed that perceptions of mind were significantly correlated to the perceived badness of the outcome for the self, $r(43) = -.45, p < .005$, but less so for the badness of the outcome for the family, $r(43) = -.26, p = .08$. Indeed, a Sobel test (MacKinnon, Warsi, & Dwyer, 1995) found that perceptions of mind helped to mediate the link between outcome and badness for the self, $Z = 1.64, p = .09$, but not for the family, $Z = .54, p = .58$.

These results suggest that PVS is seen as an exceptionally aversive state, as people think it is worse for them to be in a PVS than to die early. They also indicate that evaluations of PVS are linked to mind perception, at least when concerning the self, which is consistent with research that finds people simulate their own mental states more for decisions concerning the self than for those concerning others (Albrecht, Volz, Sutter, Laibson, & von Cramon, 2011). Of course, there are differences other than mind perception between death and PVS, and these additional factors may also contribute to the perceived badness of PVS, for both self and others (Demertzi et al., 2011).

8. Conclusions

In these experiments, people consistently viewed the persistent vegetative state as something less than dead: they ascribed less mind to people in a PVS (Experiments 1–3) and saw it as worse than death (Experiment 3). Apparent reasons for such perceptions are afterlife beliefs and the tendency to focus on the bodies of PVS patients (Experiment 2).

Although there may also be other variables operating in perceptions of PVS patients, such as liking and familiarity (Epley, Waytz, & Cacioppo, 2007; Kozak, Marsh, & Wegner, 2006), these results are consistent with a number of previous studies that highlight the power of afterlife beliefs (Bering & Bjorklund, 2004) and conceiving people as *either* minds or bodies (dualism; Demertzi, Liew, et al., 2009; Fahrenberg & Cheetham, 2000). Indeed, many health-care professions advocate such a separation between mind and body (Demertzi, Liew, et al., 2009), suggesting that even doctors may see PVS patients as having less mind than the dead. Some research, however, suggests that doctors may ascribe additional mind to those in vegetative states (Demertzi, Schnakers, et al., 2009), perhaps because frequent contact with such patients allows opportunity to ascribe mind (Epley & Waytz, 2009). Nevertheless, there is reason to believe that most people will at least implicitly have trouble ascribing mind to PVS patients.

Most importantly, these results suggest that people's perceptions of PVS are out of step with objective biological functioning. A person in PVS, after all, is more functional than a dead person. Yet people seem to have difficulty thinking about such intermediate states in which modern medical technology blurs the line between life and death, allowing people to remain in limbo. As this limbo defies easy categorization, people rely more on intuition than on neurological evidence, which can lead to ethical quandaries (Luce, 1995; Stanley, 1989). People ascribe moral rights on the basis of mind, and if PVS patients are perceived to have less mind than the dead, then they may also be granted fewer rights than the dead (Gonzalez, 2009). Moreover, if people would rather be dead than in PVS, then it suggests that caregivers should be more willing to remove life support. Of course, there are other factors involved in end of life decisions (van der Heide et al., 2003), but these data do highlight one irony: people high in religiosity are more likely to see PVS as worse off than death, but are also more likely to advocate keeping such patients alive on life support. This echoes previous findings that religious attitudes and behaviors can be discrepant when the end of life is concerned: those high in religiosity will most aggressively pursue end of life care despite the belief that souls live on (Phelps et al., 2009).

Rather than resolve the ethical debates posed by Terri Schiavo and other PVS patients, these experiments suggest another layer of complexity—lay intuitions driven by dualism distort conceptions of vegetative states. In terms of influencing policy, these findings suggest debates over the fate of such patients may hinge upon our tendency to see minds and bodies as distinct and competing conceptions of others. Advocates of terminating life support may frame vegetative patients as bodies, while those who advocate continued life support may highlight their mental capacities. Either way, these results suggest that for vegetative patients, life or death may depend more upon the mind of person making the decision than the mind of the patient.

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Appendix A. Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.cognition.2011.06.014.

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