

## **The Ship of Theseus Puzzle**

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Thought experiments play various roles in philosophy. Often, they have an *argumentative function*: The judgments they elicit bear on some philosophical debate. The Gettier case, the Gödel case, the Twin Earth case, the Frankfurt case, etc., illustrate the argumentative function of thought experiments. Much of recent metaphilosophy (e.g., Williamson, 2007; Machery, 2017) examines whether and how thought experiments can fulfill this argumentative function. But thought experiments also have less controversial functions. Sometimes they are just meant to *illustrate* a definition or a theory: Arguably, Davidson's swampman case is only meant to

illustrate (not to support) the proposition that the content of thoughts depends on historical facts. Another function of cases is to *provoke* the reader, that is, to elicit puzzlement in order to motivate philosophical inquiry. Metaphysical cases such as the statue of clay case are often meant to fulfill this provocative function.

To fulfill a provocative function, a thought experiment must meet the following condition (which we will call “Ambivalence”): Readers should feel inclined to assert two *prima facie* inconsistent propositions. This ambivalence is instrumental in leading readers to philosophize about the philosophical issue raised by this thought experiment (be it identity, persistence, constitution, etc.). Ambivalence refers to a psychological fact—that is, it is a psychological fact that readers are so inclined—and psychological methods can be used to assess whether a thought experiment successfully provokes. A thought experiment fails to fulfill its provocative function if it elicits a single, obvious answer.

If a provocative thought experiment is meant to provoke not just readers from a particular cultural background, but all or most readers, it must fulfill a second condition (which we will call “Universality”): It must elicit an ambivalent state of mind in readers of all demographic, particularly of all cultural, backgrounds.

In this article, we examine whether one of the most venerable thought experiments in metaphysics, the Ship of Theseus case, successfully fulfills its provocative function.<sup>1</sup> The Ship of Theseus case is an ancient puzzle about persistence. It emerges in partial form in the writings of the Greek biographer Plutarch (1914) and is fleshed out in its modern form by Hobbes (1839):

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<sup>1</sup> We will remain neutral about whether the Ship of Theseus case also has an argumentative function and about whether it successfully fulfills it.

For if, for example, that ship of Theseus, concerning the difference whereof made by continued reparation in taking out the old planks and putting in new, the sophisters of Athens were wont to dispute, were, after all the planks were changed, the same numerical ship it was at the beginning; and if some man had kept the old planks as they were taken out, and by putting them afterwards together in the same order, had again made a ship of them, this, without doubt, had also been the same numerical ship with that which was at the beginning; and so there would have been two ships numerically the same, which is absurd. (De Corpore II, p. 11)

The issue is this: On the one hand, it seems that the Ship of Theseus can survive the gradual replacement of parts and so it seems that the ship made by gradually replacing the parts (we'll call it "Replacement") is indeed the original ship. On the other hand, when all of the original parts are assembled in the same form as the original ship, it seems that the ship made from the original parts (we'll call it "Original Parts") is indeed the original ship. Both can't be the original ship. So which one is the original ship—the Ship of Theseus— Replacement or Original Parts?

Many philosophers have viewed this case as presenting a genuine puzzle arising from two opposite inclinations to judge: The "continuity of form" between the original ship and Replacement leads us to think that Replacement is the original ship, while the "continuity of matter" between the original ship and Original Parts leads us to think that Original Parts is the original ship. These two criteria for reidentifying objects pull in opposite directions (Rea, 1995, p. 532; see also e.g., Hirsch, 1982; Hughes, 1997; Lowe, 1983; Nozick, 1981; Scaltsas, 1980; Sider, 2001; Simons, 1987; Wiggins, 1980).

Some philosophers who think the Ship of Theseus case presents a genuine puzzle about identity even doubt that the puzzle has a solution. For instance, Scaltsas (1980) claims that "the example of Theseus's ship . . . [is an] actual paradox.... [T]here is no sharply defined hierarchy of sufficiency conditions [for artifact identity], so that in cases of conflict we are not always in a position to determine whether the new object is identical to the initial one or not. The reason is that the cases of conflict are so rare in everyday life ... Hence, our intuitions are blunt when it comes to making such decisions" (p. 152). In a similar vein, Wiggins (1980) claims that the Ship of Theseus case is "irreclaimably paradoxical" (p. 97).

By contrast, other philosophers deny that the Ship of Theseus case presents a genuine puzzle. Smart, in particular, holds that thinking that the continuity of matter criterion for identity is important has led to "false beliefs—(1) that this condition [i.e., the continuity of matter criterion] applies to the Ship of Theseus case and (2) that it either outweighs or is outweighed by the continuity of form condition" and this has "been responsible for generating a puzzle where no real puzzle or need for a decision exists" (Smart, 1973, p. 27). The "obvious solution," according to Smart, is that Replacement is the original ship and the "existing rules of identity" prove to be "perfectly adequate for this unusual case" yielding "a non-arbitrary and clear-cut decision" (Smart, 1972, p. 148).<sup>2</sup>

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<sup>2</sup> It is not entirely clear how to understand Smart's claim that the Ship of Theseus puzzle has an "obvious solution." An anonymous reviewer points out that Smart's claim may not be about our *judgments* about persistence: It may not be a psychological claim. Rather, Smart may be merely saying that one of the two options is clearly the correct one. We believe that Smart's claim that there is an "obvious solution" can be understood in several ways, including in a non-

Our goal in this article is to examine whether the Ship of Theseus case is a genuine puzzle that can fulfill the provocative function. We won't address the question of how objects actually persist through part alterations. To use the terminology of Machery (2017), we are not concerned with the material problem of persistence. Nor will we examine the metaphilosophical question of whether the judgments elicited by the Ship of Theseus case can somehow be brought to bear on philosophical theorizing about identity. Instead, we examine whether Ambivalence and Universality hold for the Ship of Theseus case, i.e., whether the Ship of Theseus case elicits contradictory inclinations to judge and whether it does so across demographic groups.

### **1. Sailing the Ship of Theseus Across the Globe**

Our strategy for addressing whether the Ship of Theseus case fulfills its provocative function was to conduct a cross-cultural study. The case we used, which is modeled on the Ship of Theseus case, was adapted from Rose (2015):

John is an accomplished woodworker and sailor, whose lifelong hobby is building rowboats by hand. He built his first rowboat—which he named “Drifter”—thirty years ago. Over the years there has been wear and tear, and every single one of the original planks in that rowboat has been replaced.

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psychological way. However, one way of understanding it is psychological: On this reading, Smart is saying that the case isn't puzzling, and that one of the two options strikes the reader as being correct. In any case, we take this claim as a psychological thesis worth exploring in its own right, especially since it bears on the provocative function of philosophical cases and on whether the Ship of Theseus case can fulfill this function.

John—never one to throw anything out—has stored all of the original planks in his shed over the years. Last month John—realizing that he had accumulated enough old planks for a whole rowboat—took out his old plans for Drifter and assembled these old planks exactly according to his old plans. John now has two rowboats of the same design: the rowboat that resulted from gradually replacing the original planks used to build a boat thirty years ago and that now has none of its original planks, and the rowboat just built one month ago with all and only the original planks that were used thirty years ago.

John has promised two of his friends—Suzy and Andy—that they can borrow Drifter for an outing. But Suzy and Andy disagree on which of the two rowboats is actually Drifter. Andy thinks that the rowboat just built a month ago is actually Drifter since it has exactly the same planks, arranged in exactly the same way as Drifter originally had. But Suzy thinks that the rowboat that resulted from gradually replacing the original planks used to build a boat thirty years ago is actually Drifter since, even though it has all new parts, this was just the result of normal maintenance.

After reading the case, participants were asked the following comprehension question:

*Comprehension.* According to the story, which of the following statements is correct?

- (1) The boat John built one month ago is made of new planks.
- (2) The boat John built one month ago is made of thirty-year old planks.

They were then asked the key test question:

*Persistence.* Please indicate whether you agree with Suzy or Andy



(1) I agree with Suzy that Drifter is the rowboat that resulted from gradually replacing the original planks used to build a boat thirty years ago and that now has none of its original planks.

(2) I agree with Andy that Drifter is the rowboat built a month ago with the planks and plans that were used thirty years ago.

Finally, participants were asked to indicate how certain they were in their response to Persistence, on a 0-100% scale, with low numbers indicating uncertainty and high numbers indicating certainty.

Data was collected from 2,722 people across twenty-five samples, spanning twenty-two countries. The case was translated from English into seventeen different languages and presented in the dominant local language for each group. 296 people answered Comprehension incorrectly. Demographics for the remaining participants are in Table 1.

**Table 1.** Demographic information about the study’s participants who answered Comprehension correctly, including countries in which data were collected, nature of the sample (students vs. non-students), and mode of survey administration (paper-pencil vs. web-based, volunteers vs. in exchange for compensation, language of the survey).

<b>Country</b>	<b>Students?</b>	<b>Method</b>	<b>Payment</b>	<b>Language</b>	<b><i>N</i></b>
<b>Europe</b>					

Bulgaria	N	Web-based	Volunteers	Bulgarian	81
Bulgaria	Y	Web-based	Volunteers	Bulgarian	78
France	N	Web-based	Compensation & volunteers	French	192
Germany	N	Web-based	Compensation	German	99
Italy	Y	Paper-pencil	Volunteers	Italian	90
Lithuania	N	Paper-pencil	Volunteers	Lithuanian	62
Lithuania	Y	Paper-pencil	Volunteers	Lithuanian	76
Portugal	Y	Paper-pencil	Volunteers	Portuguese	87
Spain	N	Web-based	Compensation	Spanish	122
Switzerland	N	Paper-pencil &	Volunteers	French	38

		web- based			
Switzerland	Y	Paper- pencil & web- based	Compensation & volunteers	French	17
UK	N	Web- based	Compensation	English	136
<b>Middle East</b>					
Iran	N	Paper- pencil	Volunteers	Persian	100
Israel	Y	Web- based	Volunteers	Hebrew	74
Bedouin	N	Paper- pencil	Volunteers	Arabic	38

<b>Central &amp; North America</b>					
Mexico	N	Paper-pencil	Volunteers	Spanish	50
USA	N	Web-based	Compensation	English	110
<b>South America</b>					
Brazil	Y	Paper-pencil	Volunteers	Portuguese	73
Colombia	N	Paper-pencil	Volunteers	Spanish	56
<b>East Asia</b>					
China	Y	Paper-pencil	Volunteers	Chinese	73
China	Y	Paper-pencil	Volunteers	Chinese, Simplified	84

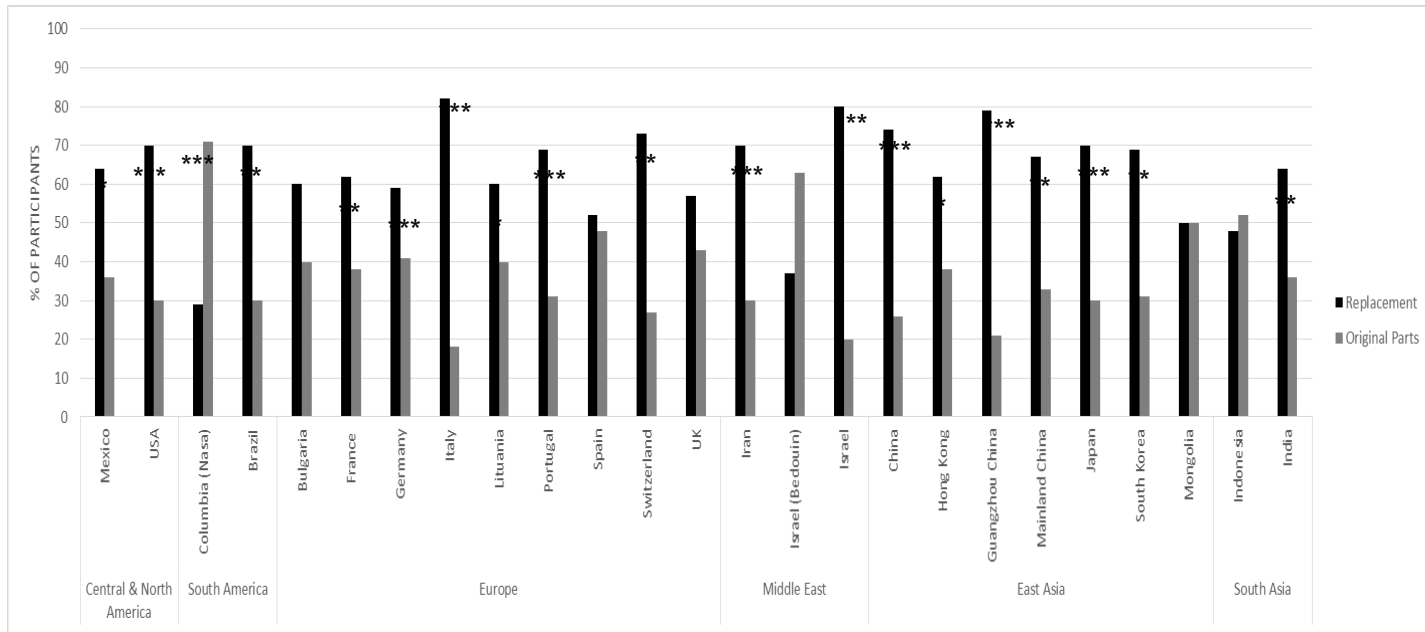
China	N	Web-based	Compensation	Chinese, Simplified	95
Hong Kong	Y	Web-based	Compensation	Chinese, Traditional	86
Japan	N	Web-based	Compensation	Japanese	89
Japan	Y	Paper-pencil	Volunteers	Japanese	92
South Korea	N	Web-based	Compensation	Korean	74
Mongolia	Y	Paper-pencil	Volunteers	Mongolian	77
<b>South &amp; Southeast Asia</b>					
Indonesia	Y	Paper-pencil	Compensation	Indonesian	85
India	Y	Paper-pencil	Volunteers	Bengali	92

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Analyzing responses from the remaining 2,426 participants, we found that 64% of participants thought that Replacement was the original ship and that this differed significantly from chance  $\chi^2(2426)=181.911, p<.001$  . We also found an effect of Site on persistence intuitions,  $\chi^2(24, 2426)=113.804, p<.001$ , Cramer's  $V=.217$  (see Figure 1). We then examined, within each site, whether persistence intuitions differed from what would be expected by chance (see Figure 1 and Supplementary Materials).<sup>3</sup>

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<sup>3</sup> We also conducted a logistic regression analysis that included site, age, gender, the Cognitive Reflection test or CRT (Frederick, 2005), our own adapted version of the Disjunctive Thinking Test (Shafir, 1994), the 18-item Need for Cognition Scale or NFC (Cacioppo, Petty, & Kao, 1984), the 12-item Personal Need for Structure Scale or NFS (Thompson, Naccarato, Parker, & Moskowitz, 2001), and the 10-item Personality Inventory or TIPI (Gosling, Rentfrow, & Swann, 2003). The full model was significant,  $\chi^2(36, N=2046)=1441.715, p<.000$  (Nagelkerke  $R^2=.092$ ). However, only site (Wald  $\chi^2=41.353, df=23, p=.011$ ) and CRT (Wald  $\chi^2=27.865, df=3, p<.001$ ) significantly predicted Persistence. We should flag, though won't pursue here, that interestingly increased reflectivity makes one even more divided (CRT=0, 76% Replacement, CRT=1, 73% Replacement, CRT=2, 59% Replacement, CRT=3, 58% Replacement). Reflection may make us suspicious of our intuitions but doesn't seem to offer a clear verdict or otherwise help us resolve the issue.



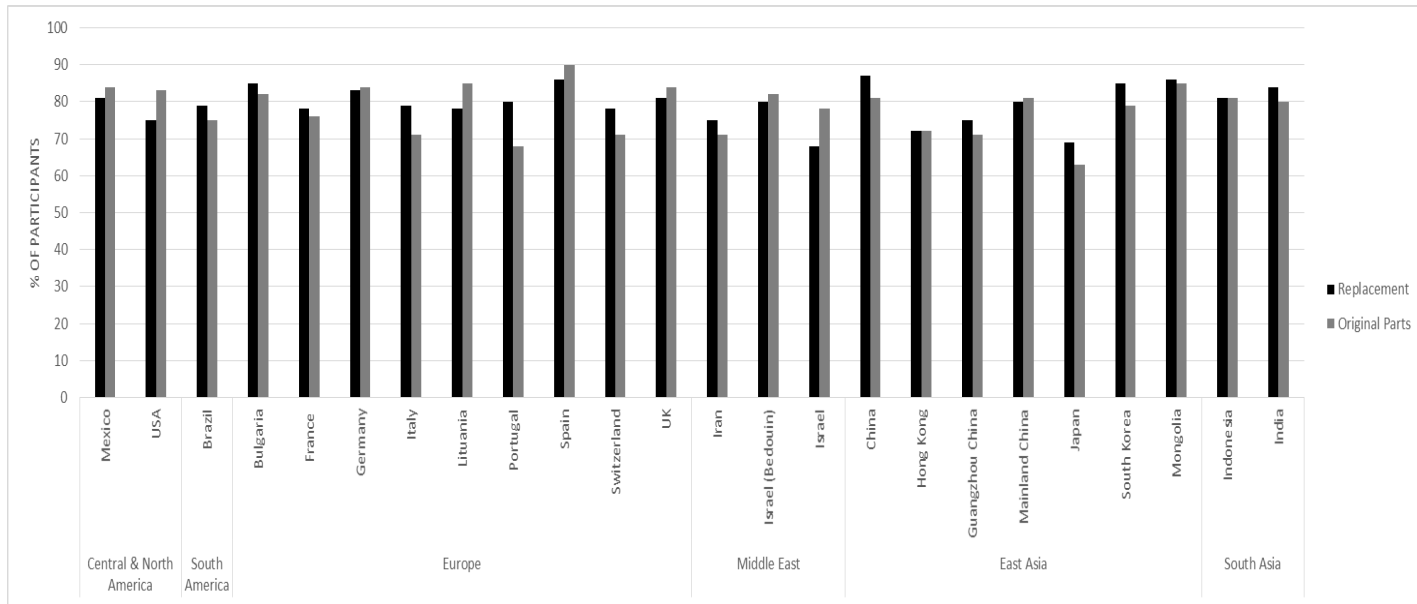
**Figure 1: Rates of Persistence Intuitions with Results Against Chance (50%) for Each Site**

(\*= $p < .05$ , \*\*= $p < .01$ , \*\*\*= $p < .001$ )

Finally, we examined certainty ratings. We conducted a two-way ANOVA with Persistence (Replacement, Original Parts) and Site as predictors of Certainty. We found that Persistence (Replacement,  $M=78.67$ ,  $SD=21.73$ ; Original Parts,  $M=79.02$ ,  $SD=22.21$ ) did not predict Certainty,  $F(1, 2303)=1.021$ ,  $p=.312$ ,  $\eta^2=.000$ , that Site predicted Certainty,  $F(23, 2303)=6.017$ ,  $p<.001$ ,  $\eta^2=.057$  and that there was no interaction between Persistence and Site,  $F(23, 2303)=1.263$ ,  $p=.180$ ,  $\eta^2=.012$  (see Figure 2).<sup>4</sup> Moreover, for each site, Certainty ratings were

<sup>4</sup> Colombia is excluded from this analysis since our collaborator who collected data from the indigenous Nasa people of Colombia indicated that participants would have difficulty representing degrees of certainty on an abstract numerical scale. For certainty, the Nasa were give a 7 point scale as follows:

significantly different from chance regardless of whether people thought Replacement or Original Parts was the original ship (see Table 2 in Supplementary Materials).



**Figure 2: Certainty Ratings for Persistence Intuitions for Each Site**

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- (1) Completely unsure
  - (2) Unsure
  - (3) Somewhat unsure
  - (4) Neutral
  - (5) Somewhat sure
  - (6) Sure
  - (7) Completely sure

There was no effect of Persistence on Certainty (Replacement,  $M=6.43$ ,  $SD=.813$ ; Original Parts,  $M=6.12$ ,  $SD=.991$ ),  $F(1, 54)=1.247$ ,  $p=.269$ ,  $\eta p^2=.023$ .



Two things bear emphasizing. First, in some sites, participants clearly judge that Replacement is the original ship (e.g., Italy, 82%), in other sites participants are divided (e.g., Mongolia, 50%), while in others participants clearly judge that Original Parts is the original ship (e.g., Colombia, 71%).<sup>5</sup> Second, regardless of whether participants judged that Replacement or Original Parts was the original ship, participants were highly certain in their judgment (Replacement, 68%-87%; Original Parts, 63%-90%).

### **3. The Puzzle Reassessed**

To repeat a point made in the introduction, we focus exclusively on the psychological question of whether the Ship of Theseus case is a genuine puzzle—one that can support its provocative use in philosophical discussions— and not on the nature of persistence itself or the justification for the use of thought experiments in philosophy. So, does the Ship of Theseus present a genuine puzzle about persistence due to conflicting intuitions based on two criteria for permanence, continuity of form and continuity of matter, pulling in opposite directions (Ambivalence), and does it present a puzzle in all cultures (Universality)?

Let's begin with Ambivalence. Against the claim that the Ship of Theseus case is a genuine puzzle, it might be pointed out that the vast majority of people, across a wide range of

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<sup>5</sup> The responses of our Bedouin participants were similar to those of our participants in Colombia who were members of the indigenous Nasa tribe. 63% of the Bedouins judged that Original Parts was the original ship. This isn't different from chance ( $p=.10$ ) but the power of the test is very low because of the small sample size (only 38).

sites and languages, clearly thought that Replacement was the original ship. So, perhaps, the Ship of Theseus case is not that puzzling after all.

However, first, we shouldn't dismiss the answers based on continuity of matter so quickly. Even though the majority of sites judged that Replacement was the original ship, 68% (13/19) of the sites that tended to judge that Replacement was the original ship gave majority ratings that fell within the 60%-70% range. That leaves quite a sizable minority—in the 30%-40% range—who thought that Original Parts was the original ship. It is doubtful that people giving these minority answers misunderstood the case or the questions, and it would be an unsupported speculation to propose that they fall victim to some kind of error that fails to reflect anything about the criteria that constitute their concept of persistence. It is also clear that they did not answer randomly since those that settled on the minority answer tended to be highly confident in their judgment.

What about Universality? The first thing to notice is that five sites (Bulgaria, Spain, the UK, Mongolia, and Indonesia) were clearly divided in the sense that the proportion of responses that Replacement is identical to the original boat did not significantly differ from chance. Among the sites that were not so divided, the consensus among two groups from traditional societies in our sample—the Nasa of Colombia and the Bedouins of Israel—was that continuity of matter was more relevant in determining which ship was the Ship of Theseus.<sup>6</sup> For those groups as for

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<sup>6</sup> An anonymous reviewer suggests that the cultural variability we find might be due to “noise.” We acknowledge that this is a possibility but think it unlikely for two reasons. First, our findings cohere with those presented by Lucy (1992) who found that Yucatec-speaking Maya classify objects on the basis of material while English speakers do so on the basis of shape or form. This

those where the modal answer is based on continuity of form a sizable minority gave the opposite answer, and people in the minority were confident in their answer, suggesting that in all cultures we have looked at people are ambivalent when they read the Ship of Theseus case.

Our results do indeed suggest that the Ship of Theseus case is a puzzle: People across cultures are ambivalent about what to say in response to the case. But they do not suggest it is one that feels unsolvable or that it is “irreclaimably paradoxical,” placing us in a permanent state of indecision. If this were the case, then we should have found that people were divided on whether Replacement or Original Parts was the Ship of Theseus and that they were not very confident in the option they ultimately settled on. But this is not at all what we found. The majority of sites offered a clear verdict and did so quite confidently.<sup>7</sup>

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suggests that there is a general difference in classification styles by those in more industrialized and more traditional societies. And this coheres with our findings suggesting that those in more traditional societies such as the Nasa and the Bedouins, trace persistence on the basis of original material and those in more industrialized societies such as the USA and China trace persistence on the basis of form. At least some of the diversity we find is plausibly due to these more general differences in classification styles and not mere “noise.” Second, if the diversity we have uncovered is attributable to mere “noise,” then we should also expect this to be reflected in certainty ratings, but people were overall highly confident in their persistence judgment. So, taken together, we think it is implausible that the diversity we have uncovered is simply due to “noise.”

<sup>7</sup> An anonymous reviewer suggests that the Ship of Theseus case might be a puzzle because of the high confidence associated with each of the contradictory answers. Our findings do indicate

Perhaps then, we do have two conflicting criteria, “continuity of form” and “continuity of matter” that constitute our concept of persistence and pull us in opposite directions. But people tend to settle on one answer or another and do so with confidence. The variability we find—e.g., with some sites clearly judging that Replacement is the original ship, others being divided and others clearly judging that Original Parts is the original ship—is plausibly due to people placing different weight on which criterion to use in determining which of the two ships is the original ship. The only remaining question would be what determines which criterion receives more weight in a given context.<sup>8</sup> For any proposed answer, we would flag that it needs to explain the variability we found both within and across cultures. But these are matters that fall beyond the scope of this paper. At this point, our results suggest that there are two criteria that constitute our concept of persistence and these two criteria receive different weightings in settling matters

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that people are highly confident in their judgments, but they don’t suggest that people are highly confident in two conflicting judgments: that the original ship is Replacement and that the original ship is Original Parts. Instead, different people make different judgments and they are highly confident in the judgment they arrive at.

<sup>8</sup> An anonymous reviewer points out that the context of use of the boat—Andy and Suzy wanting to take Drifter out—may be playing a role in people’s judgments about persistence. The reviewer also notes that adding “both Original Parts and Replacement are the original ship” and “neither Original Parts nor Replacement is the original ship” as response options could be illuminating, especially since some philosophers have defended views in line with these options (see e.g., Gallois, 2016; Pickup, 2016). We think these are excellent directions for future research.

concerning persistence. And this seems to cohere best with the psychological view that the Ship of Theseus is a genuine puzzle but one that people can solve to their satisfaction. The Ship of Theseus case does elicit puzzling judgments across a wide range of cultural groups speaking very different languages. It fulfills its provocative use.

### **3. Conclusion**

Does the Ship of Theseus case present a genuine puzzle about persistence? That is, does it elicit puzzling judgments that support its provocative use? We set out to examine this question by conducting a cross-cultural study involving nearly 3,000 people across twenty-two countries, speaking eighteen different languages. Our results are hard to square with the proposal that there really is no puzzle at all. They also speak against the proposal that there is a genuine puzzle but one that feels unsolvable, perhaps because our intuitions are “blunt” and “irreclaimably paradoxical.” Our results seem to cohere best with the view that there are two criteria—continuity of form and continuity of matter—that constitute our concept of persistence and these two criteria receive different weightings in settling matters concerning persistence.<sup>9</sup>

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## References

- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment*, 48, 306–307.
- Frederick, S. (2005). Cognitive reflection and decision making. *The Journal of Economic Perspectives*, 19, 25-42.
- Gallois, A (2016). Identity over time. In Edward N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy*. <<https://plato.stanford.edu/archives/win2016/entries/identity-time/>>.
- Garrett, B. J. (1985). Noonan, ‘Best Candidate’ Theories, and the Ship of Theseus. *Analysis*, 45, 212-215.
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the Big Five Personality domains. *Journal of Research in Personality*, 37, 504-528.
- Hirsch, E. (1982). *The Concept of Identity*. Oxford University Press.
- Hobbes, T. (1839). *The English Works of Thomas Hobbes, vol. 1: Concerning Body*. Ed. William Molesworth. London: John Bohn.
- Hughes, C. (1997). Same-Kind Coincidence and the Ship of Theseus. *Mind*, 106, 53-67.
- Lucy, J. A. (1992). Grammatical categories and cognition: a case study of the linguistic relativity hypothesis. Cambridge: Cambridge University Press.
- Lowe, E. J. (1983). On the Identity of Artifacts. *The Journal of Philosophy*, 80, 220-232.
- Machery, E. (2017). *Philosophy Within Its Proper Bounds*. Oxford University Press.
- Pickup, M. (2016). A situationist solution to the ship of Theseus puzzle. *Erkenntnis*, 81, 973-992.
- Plutarch (1914). *Plutarch's Lives*. English Translation by Bernadotte Perrin. Cambridge, MA. Harvard University Press: London, William Heinemann Ltd.

- Nozick, R. (1981). *Philosophical Explanations*. Harvard University Press: Cambridge, Massachusetts.
- Rea, M. (1995). The Problem of Material Constitution. *Philosophical Review*, 104, 525-552.
- Rose, D. (2015). Persistence Through Function Preservation. *Synthese*, 192, 97-146.
- Scaltsas, T. (1980). The Ship of Theseus. *Analysis*, 40, 152-157.
- Shafir, E. (1994). Uncertainty and the difficulty of thinking through disjunctions. *Cognition*, 50, 403-430.
- Sider, T. (2001). *Four Dimensionalism*. Oxford University Press.
- Simons, P. (1987). *Parts: A Study in Ontology*. Oxford: Oxford University Press
- Smart, B. (1972). How to Reidentify the Ship of Theseus. *Analysis*, 32, 145-148.
- Smart, B. (1973). The Ship of Theseus, the Parthenon and Disassembled Objects. *Analysis*, 34, 24-27.
- Thompson, M. M., Naccarato, M. E., Parker, K. C. H., & Moskowitz, G. (2001). The Personal Need for Structure (PNS) and Personal Fear of Invalidity (PFI) scales: Historical perspectives, present applications and future directions. In G. Moskowitz (Ed.), *Cognitive social psychology: The Princeton symposium on the legacy and future of social cognition* (pp. 19-39). Mahwah, NJ: Erlbaum.
- Wiggins, D. (1980). *Sameness and Substance*. Cambridge University Press.

**Supplemental Materials**

**Table 1: Logistic regression results for Persistence 1 (a: reference class – males; b: reference class - France; c: reference class – correct answer; d: reference class - CRT score = 0)**

Variable	$\beta$	SE	$p$	Odds ratio	Odds ratio 95% CI
Age	.00	.00	.61	1.00	[.99, 1.01]
Gender <sup>a</sup>	-.06	.10	.53	.94	[.77, 1.14]
<b>Europe</b>					
Bulgaria <sup>b</sup>	.13	.25	.60	1.13	[.70, 1.86]
Germany <sup>b</sup>	-.13	.31	.69	.88	[.48, 1.63]
Italy <sup>b</sup>	.39	.31	.22	1.48	[.80, 2.73]
Lithuania <sup>b</sup>	.12	.27	.66	1.13	[.66, 1.94]
Portugal <sup>b</sup>	-.30	.32	.35	.74	[.40, 1.40]
Spain <sup>b</sup>	.33	.28	.23	1.40	[.81, 2.40]
Switzerland <sup>b</sup>	-.48	.38	.21	.62	[.30, 1.30]
UK <sup>b</sup>	.04	.27	.88	1.04	[.62, 1.76]
<b>North America</b>					
Mexico <sup>b</sup>	-.26	.37	.49	.77	[.37, 1.60]
USA <sup>b</sup>	-.33	.30	.27	.72	[.40, 1.30]



<b>South America</b>					
Brazil <sup>b</sup>	-.32	.33	.33	.73	[.40, 1.40]
Columbia <sup>b</sup>	1.07	.39	.007	2.90	[1.35, 6.26]
<b>Middle East</b>					
Iran <sup>b</sup>	-.28	.30	.34	.75	[.42, 1.40]
Israel (Bedouins) <sup>b</sup>	.683	.42	.11	1.98	[.86, 4.55]
Israel (Jews) <sup>b</sup>	-.50	.37	.18	.61	[.30, 1.25]
<b>Asia</b>					
China <sup>b</sup>	-.07	.352	.84	.93	[.47, 1.86]
Guangzhou China <sup>b</sup>	-.37	.35	.27	.69	[.35, 1.37]
Mainland China <sup>b</sup>	-.19	.33	.56	.83	[.44, 1.57]
Hong Kong <sup>b</sup>	.07	.34	.83	1.08	[.55, 2.01]
India <sup>b</sup>	-.16	.33	.62	.85	[.45, 1.62]
Japan <sup>b</sup>	-.89	.36	.01	.41	[.20, .83]
Mongolia <sup>b</sup>	.20	.37	.58	1.22	[.61, 2.50]
South Korea <sup>b</sup>	-.23	.25	.36	.79	[.48, 1.31]
Disjunctive thinking <sup>c</sup>	.06	.11	.56	1.06	[.86, 1.62]
CRT (=1) <sup>d</sup>	.02	.16	.93	1.02	[.74, 1.40]
CRT (=2) <sup>d</sup>	.57	.16	<.001	1.76	[1.29,2.41]
CRT (=3) <sup>d</sup>	.66	.16	<.001	1.93	[1.42, 2.62]
NFC	-.13	.10	.17	.88	[.73, 1.06]
NFS	.07	.08	.38	1.07	[.92, 1.26]

Extraversion	.04	.04	.32	1.04	[.97,1.11]
Agreeableness	.02	.05	.62	1.02	[.93, 1.12]
Conscientiousness	.03	.05	.47	1.03	[.95, .1.23]
Neuroticism	.04	.04	.27	1.04	[.97, 1.13]
Openness to experience	-.03	.05	.52	.97	[.87, 1.07]

**Table 2: Test of Persistence Judgments Against Chance (50%) for Each Site (\*= $p < .05$ ,**

**\*\*= $p < .01$ , \*\*\*= $p < .001$ )**

<b>Sample</b>	<b>Persistence</b> ( $\chi^2$ ) (p-value)
<b>Central and North America</b>	
Mexico	3.920 *
USA	17.600 ***
<b>South America</b>	
Columbia	10.286 ***
Brazil	11.521 **
<b>Europe</b>	
Bulgaria	6.849 **
France	10.083 **
Germany	15.705 ***
Italy	37.378 ***

Lithuania	5.681 *
Portugal	12.517 ***
Spain	.295 .587
Switzerland	11.364 **
UK	2.941 .086
<b>Middle East</b>	
Iran	16.000 ***
Bedouin	2.632 .105
Israel	26.162 ***
<b>East Asia</b>	
China	16.781 ***
Hong Kong	4.651 *
Guangzhou China	27.429 ***
Mainland China	11.463 **
Japan	29.442 ***
South Korea	10.595 **
Mongolia	.013 .909
<b>South Asia</b>	
Indonesia	.106 .745
India	7.348 **

**Table 3: Test of Certainty Judgments Against Chance for Each Site (\*= $p < .05$ , \*\*= $p < .01$ , \*\*\*= $p < .001$ )**

<b>Sample</b>	<b>Replacement</b> (t-value) (p-value)	<b>Original Parts</b> (t-value) (p-value)
<b>Central and North America</b>		
Mexico	8.056 ***	7.881 ***
USA	11.458 ***	9.395 ***
<b>South America</b>		
Columbia	11.979 ***	13.549 ***
Brazil	9.025 ***	6.424 ***
<b>Europe</b>		
Bulgaria	17.947 ***	11.067 ***
France	13.393 ***	8.639 **
Germany	15.705 ***	10.033 ***
Italy	12.671 ***	2.885 *
Lithuania	10.096 ***	13.618 ***
Portugal	10.010 ***	3.521 **
Spain	13.844 ***	17.200 ***
Switzerland	9.229 ***	3.705 **
UK	12.178 ***	11.986 ***
<b>Middle East</b>		
Iran	8.734	4.698

	***	***
Bedouin	6.638 ***	9.230 ***
Israel	4.109 ***	3.731 **
<b>East Asia</b>		
China	17.863 ***	7.343 ***
Hong Kong	7.388 ***	5.862 ***
Guangzhou China	11.478 ***	5.234 ***
Mainland China	14.223 ***	9.253 ***
Japan	8,828 ***	4.115 ***
South Korea	15.876 ***	5.247 ***
Mongolia	15.596 ***	11.125 ***
<b>South Asia</b>		
Indonesia	10.979 ***	13.641 ***
India	13.459 ***	9.088 ***