

Author's personal copy. Forthcoming as:
Dranseika, V. (Forthcoming). Two ships of Theseus. *Synthese*.

Two Ships of Theseus

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Abstract.

Based on a large cross-cultural study, David Rose and his colleagues (Rose et al. (2020). The Ship of Theseus puzzle. In: T. Lombrozo, J. Knobe, and S. Nichols (eds), *Oxford Studies in Experimental Philosophy*, Vol. 3. Oxford: Oxford University Press, pp. 158–174.) argue that the Ship of Theseus story is a genuine puzzle in the sense that people who consider it feel inclined to assert two prima facie inconsistent propositions (*Ambivalence*). In response, Marta Campdelacreu and her colleagues (Campdelacreu et al. (2020). How to test the Ship of Theseus. *Dialectica*, 74(3): 551–559.) argue that the data reported by Rose et al. (2020) fail to support *Ambivalence*. Namely, the data show sharp *interpersonal* disagreement among different readers of the Ship of Theseus story, but they fail to demonstrate an *intrapersonal* conflict or indecision. Should *intrapersonal Ambivalence* be demonstrated, this, according to Campdelacreu et al. (2020), would be a good indicator of the presence of a puzzle. Here, I provide empirical evidence for *intrapersonal Ambivalence* about the Ship of Theseus story.

Keywords. Ship of Theseus; Intrapersonal ambivalence; Ontological pluralism; Experimental philosophy

1. Introduction

It is a platitude that artifacts can be repaired by replacing their damaged parts with new ones. It is also a platitude that artifacts made of parts can be disassembled, stored in a disassembled form, and later reassembled. The story of the Ship of Theseus is an ancient problem about persistence (Plutarch, 1914: 49) that—presented in its modern form by Thomas Hobbes (1839: 136–7) —clashes these two platitudes. While Plutarch describes how a wooden ship is continuously repaired until it contains no original parts,¹ Hobbes adds a twist—the old wooden parts are stored and put together in the original order.² Thus, in Hobbes' version, there are two resultant ships, and—based on the two platitudes above—each is a plausible candidate to be the original ship. The trouble, notes Hobbes, is that two ships cannot be numerically the same.

Recently, David Rose, Edouard Machery, Stephen Stich and their colleagues (2020) set out to explore the psychological effects of this thought experiment. They note that one of the functions of thought experiments in philosophy is "to *provoke* the reader, that is, to elicit puzzlement in order to motivate philosophical inquiry" (*ibid.* p. 159). According to the authors, a thought experiment must have the following psychological effect to successfully

¹ Plutarch (*Plutarch's Lives, Theseus*, XXIII. 1): "The ship on which Theseus sailed with the youths and returned in safety, the thirty-oared galley, was preserved by the Athenians down to the time of Demetrius Phalereus. They took away the old timbers from time to time, and put new and sound ones in their places, so that the vessel became a standing illustration for the philosophers in the mooted question of growth, some declaring that it remained the same, others that it was not the same vessel."

A structurally similar story about demons tearing off parts of a traveler's body and replacing them with body parts of a corpse was used in a Buddhist treatise from around the fourth century CE to explore issues of selfhood and personal identity (see Huang & Ganeri 2021).

² Hobbes (*De Corpore*, Part II, Ch. 11, §7): "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."

fulfill its provocative function: "Readers should feel inclined to assert two prima facie inconsistent propositions" (*ibid.*). They argue—based on a large cross-cultural study—that the story of the Ship of Theseus is (a) a genuine puzzle in the sense that people who consider it feel inclined to assert two prima facie inconsistent propositions (*Ambivalence*) and that (b) this is true cross-culturally (*Universality*).

In the study reported by Rose et al. (2020), study participants read the following story modeled on the story of the Ship of Theseus (adapted with major modifications 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.

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 this story, study participants indicated whether they agree with Suzy or Andy, with the following two response options provided (parts in brackets not shown to the participants):

[Replacement] 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.

[Original Parts] 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, study participants indicated how certain they were in their response (on a 0–100% scale, with low numbers indicating uncertainty and high numbers indicating certainty).

Rose and his colleagues argued for *Ambivalence* and *Universality* based on the fact that (i) in all twenty-four sites in which the data were collected, there was either a nearly equal split of responses (five sites) or where there was a majority answer, there was at least a sizable minority giving an opposite answer and (ii) people in the minority (as well as those who were in the majority) were confident in their responses.

More recently, however, Marta Campdelacreu and her colleagues (2020) argued that these data fail to support *Ambivalence*. Namely, they suggest that the data presented by Rose et al. (2020) show that there is sharp *interpersonal* disagreement among different readers of the story of the Ship of Theseus, but they fail to demonstrate "*intrapersonal* conflict or indecision, felt by each reader" (*ibid.* p. 553). According to Campdelacreu and her colleagues, only if *intrapersonal Ambivalence* is demonstrated would this be "a good indicator" of the presence of a puzzle (*ibid.* notes 3 and 4). *Interpersonal* disagreements, according to Campdelacreu et al., "surely do not indicate the existence of puzzles" (*ibid.* p. 555). Therefore, the data by Rose et al. only "show that people disagree about the right answer" (*ibid.*).

While there is some earlier empirical work on the Ship of Theseus, to the best of my knowledge, none attempted to address the issue of *intrapersonal Ambivalence*. In some

cases, participants had to choose one of the two resultant objects (Hall, 1998; Cakar, 2015; Cakar & Hohenberger, 2015), as in Rose et al. (2020). There is one study, however, that can potentially shed some light on *Ambivalence*. In Study 1 of Marchak and Hall (2019), study participants read a short story about the Ship of Theseus. They answered two questions of the following form (differences between questions in brackets): "Suppose that the ship described at the beginning of the preceding paragraphs is X. Now think of the two ships that exist after the transformation and answer the following questions. Do you think the ship made of [old/new] planks is X?" Answers were provided on a scale from 1 ("very sure no") to 6 ("very sure yes"). Marchak and Hall found that study participants agreed more that the ship made of old planks is X ($M = 4.54$) than that the one made of new planks is X ($M = 3.81$). I downloaded their data and divided study participants (Study 1, *designator* condition, $N = 52$) into four groups based on their responses to these two questions. I coded participants as disagreeing with a given claim if their response was from 1 ("very sure no") to 3 ("somewhat sure no") and agreeing with the claim if their response was from 4 ("somewhat sure yes") to 6 ("very sure yes"). The largest group, 22 participants (42%), agreed with both claims. This was more frequent than could be expected by chance alone (25%), binomial test, $p = .006$. 39% agreed only with 'old parts' (also more frequent than chance, $p = .036$), 17% only with 'new parts,' and the remaining one participant (2%) disagreed with both.³ The fact that many study participants (42%) agreed with both claims simultaneously provides some initial evidence for *Ambivalence*.⁴

In the present paper, I describe five studies that provide more direct and extensive evidence for *intrapersonal Ambivalence* about the Ship of Theseus story. I do this by providing participants with additional response options and—in some of the studies—asking them to justify their responses. Furthermore, the five studies differ in these respects to ensure the results do not depend on one specific vignette and one specific way to phrase a question.

³ The four combinations were not equally distributed, $\chi^2 (3, N = 52) = 22.3, p < .001$.

⁴ But see results for adult participants in Study 1 in Marchak and Hall (2022), where almost every participant opted for an 'old-parts' object. This study, however, differs a lot from Rose et al. (2020) and Marchak and Hall (2019) in that it used not a text-based story about a ship but rather "a live re-enactment of the Ship-of-Theseus event" (Marchak & Hall, 2022: 5) using real physical artifacts – very simple toys each composed of three separable parts.

Study materials, data, and analysis code are available on *Open Science Framework* (<https://osf.io/en549>).

2. Studies

Participants. In all five studies, study participants were recruited on *Prolific* (<https://prolific.com>), a popular online research subject recruitment tool. Study participants were US or UK nationals who indicated that English was their first language, $97 \geq N \geq 135$.⁵

Study materials. Complete materials are available online. I provide a condensed explanation below.

Study 1. An Outing, 'there is a sense.' The first study is a version of the original with additional response options. Study participants read the same vignette used by Rose *et al.* 2020 (see above). However, in addition to *Replacement* and *Original Parts* (presented in a randomized order), two more response options were available (*Both* and *Neither*, presented in fixed order after the two original response options; labels in brackets not shown to the participants):

[**Replacement**] 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.

[**Original Parts**] I agree with Andy that Drifter is the rowboat built a month ago with the planks and plans that were used thirty years ago.

⁵ Study 1: $N = 100$ (after excluding 9 participants for incorrectly responding to the control question), 70% women, 30% men, $M_{\text{age}} = 35.4$, $SD = 11.6$. Study 2: $N = 100$ (after excluding 4 participants), 70% women, 29% men, 1% non-binary, $M_{\text{age}} = 37.3$, $SD = 14.5$. Study 3: $N = 135$ (after excluding 11 participants), 52% women, 47% men, 1% non-binary, $M_{\text{age}} = 35.9$, $SD = 14.1$. Study 4: $N = 110$ (after excluding 15 participants), 51% women, 49% men, $M_{\text{age}} = 37.3$, $SD = 14.3$. Study 5: $N = 97$ (after excluding 18 participants), 55% women, 44% men, 1% non-binary, $M_{\text{age}} = 38.9$, $SD = 15.2$.

[**Both**] There is a sense in which Suzy is right, and there is a sense in which Andy is right. There is a sense in which one rowboat is Drifter, and there is a sense in which the other one is Drifter.

[**Neither**] Both Suzy and Andy are mistaken, and neither of the two rowboats is Drifter.

I will refer to this question as *Additional Options*. After selecting their response to the *Additional Options*, study participants indicated how certain they were and explained their answer in one or two sentences.

On the next page, participants were asked: "If forced to choose, which of the two rowboats is the better candidate to being Drifter?" with the following two options (presented in randomized order):

[**Replacement**] 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.

[**Original Parts**] The rowboat built a month ago with the planks and plans that were used thirty years ago.

I will refer to this question as *Restricted Choice*. After responding to this question, participants indicated how certain they were.

Study 2. Museum, 'there is a sense.' Study materials were the same as in Study 1, except that the reason for borrowing was different. While in Study 1, Drifter was borrowed "for an outing," in Study 2, it was borrowed "for an exhibition in the maritime museum, where it will be shown together with the first rowboats built by other local rowboat hobbyists."⁶

⁶ This change was introduced following Wiggins' suggestion that "if one party is looking for an archaeological relic and the other for a functionally persistent continuant," they may "find different entities with different principles of individuation in one and the same place" (2001: 94). Study 2 describes the reason for identification not in terms of functional (as was the case in Study 1) but in terms of antiquarian interest.

Study 3. An Outing, 'inclined to say.' Study 3 uses the same materials as Study 1 except that *Additional Options* is framed in terms of 'inclination to say' (response options provided in randomized order).

Let us refer to the two rowboats as the first rowboat and the second rowboat. The first rowboat 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. The second rowboat is the rowboat built a month ago with the planks and plans that were used thirty years ago. Which of the following four claims best describes your position?

[Replacement] I feel inclined to say that the first rowboat is Drifter. However, I do not feel inclined to say that the second rowboat is Drifter.

[Original parts] I feel inclined to say that the second rowboat is Drifter. However, I do not feel inclined to say that the first rowboat is Drifter.

[Both] I feel inclined to say that the first rowboat is Drifter, and at the same time, I also feel inclined to say that the second rowboat is Drifter.

[Neither] I do not feel inclined to say that the first rowboat is Drifter, and I also do not feel inclined to say that the second rowboat is Drifter.

Study 4. Short, 'inclined to say.' Study 4 uses a more concise vignette:

This is a story of a ship called Theseus. Theseus was built in 1900. Over the years, there has been wear and tear, and every single one of the original parts in that ship has been replaced. Old parts were not thrown away, however. They were stored. In 2020, when all parts had been replaced, some enthusiasts acquired the old plans for Theseus and assembled the old parts exactly according to the old plans. Now, there are two ships: a ship repaired over the years with new parts and a ship built from old parts according to the old plans.

Additional Options was also shorter in Study 4, without either a discussion between the two characters (as in Studies 1 and 2) or a paragraph introducing the labels "the first" and "the second rowboat" (as in Study 3; response options provided in randomized order):

Which of the following four claims best describes your position?

[**Replacement**] I feel inclined to say that the ship repaired with new parts is Theseus.
However, I do not feel inclined to say that the ship built from old parts is Theseus.

[**Original parts**] I feel inclined to say that the ship built from old parts is Theseus.
However, I do not feel inclined to say that the ship repaired with new parts is Theseus.

[**Both**] I feel inclined to say that the ship repaired with new parts is Theseus, and at the same time, I also feel inclined to say that the ship built from old parts is Theseus.

[**Neither**] I do not feel inclined to say that the ship repaired with new parts is Theseus, and I also do not feel inclined to say that the ship built from old parts is Theseus.

Also, *Restricted Options* was compressed (response options provided in randomized order):

If forced to choose, which of the two ships is the better candidate to be Theseus?

[**Replacement**] The ship repaired with new parts.

[**Original parts**] The ship built from old parts.

Study 5. Short, 'makes sense to say.' Materials were identical to Study 4 except that *Additional Options* was phrased not in terms of "inclined to say" but in terms of "makes sense to say":

Which of the following four claims best describes your position?

[**Replacement**] It only makes sense to say that the ship repaired with new parts is Theseus.

[**Original parts**] It only makes sense to say that the ship built from old parts is Theseus.

[**Both**] It makes sense to say that the ship repaired with new parts is Theseus, but it also makes sense to say that the ship built from old parts is Theseus.

[**Neither**] It does not make sense to say that the ship repaired with new parts is Theseus, and it also does not make sense to say that the ship built from old parts is Theseus.

Results. The distribution of responses to *Additional Options* and *Restricted Choice* in all five studies is provided in Figure 1.

Additional Options. In each of the five studies, responses were not equally distributed, chi-squared tests, all $ps < .001$. In each, *Both* was the most frequent response option (ranging from 44% to 71%). *Replacement* was selected by 7% to 34% and *Original parts* – by 15% to 32% of participants. *Neither* was the least frequent response option (ranging from 3% to 7%).

Binomial tests indicate that participants in each of the five studies chose *Both* more frequently than could be expected by chance alone (25%), all $ps < .001$. Furthermore, in each of the studies, *Both* was selected more frequently than any of the other options, chi-squared tests, all $ps > .05$. The only exception was Study 3, where no difference was observed between the frequency of *Both* (44%) and *Replacement* (34%), $\chi^2 (1, N = 105) = 1.61, p = .205$.

In all five studies, study participants were relatively confident in their responses ($75\% \geq Mdn \geq 80\%$). Participants who chose different answers did not differ in confidence ratings in any of the five studies, Kruskal-Wallis tests, all $ps > .06$.

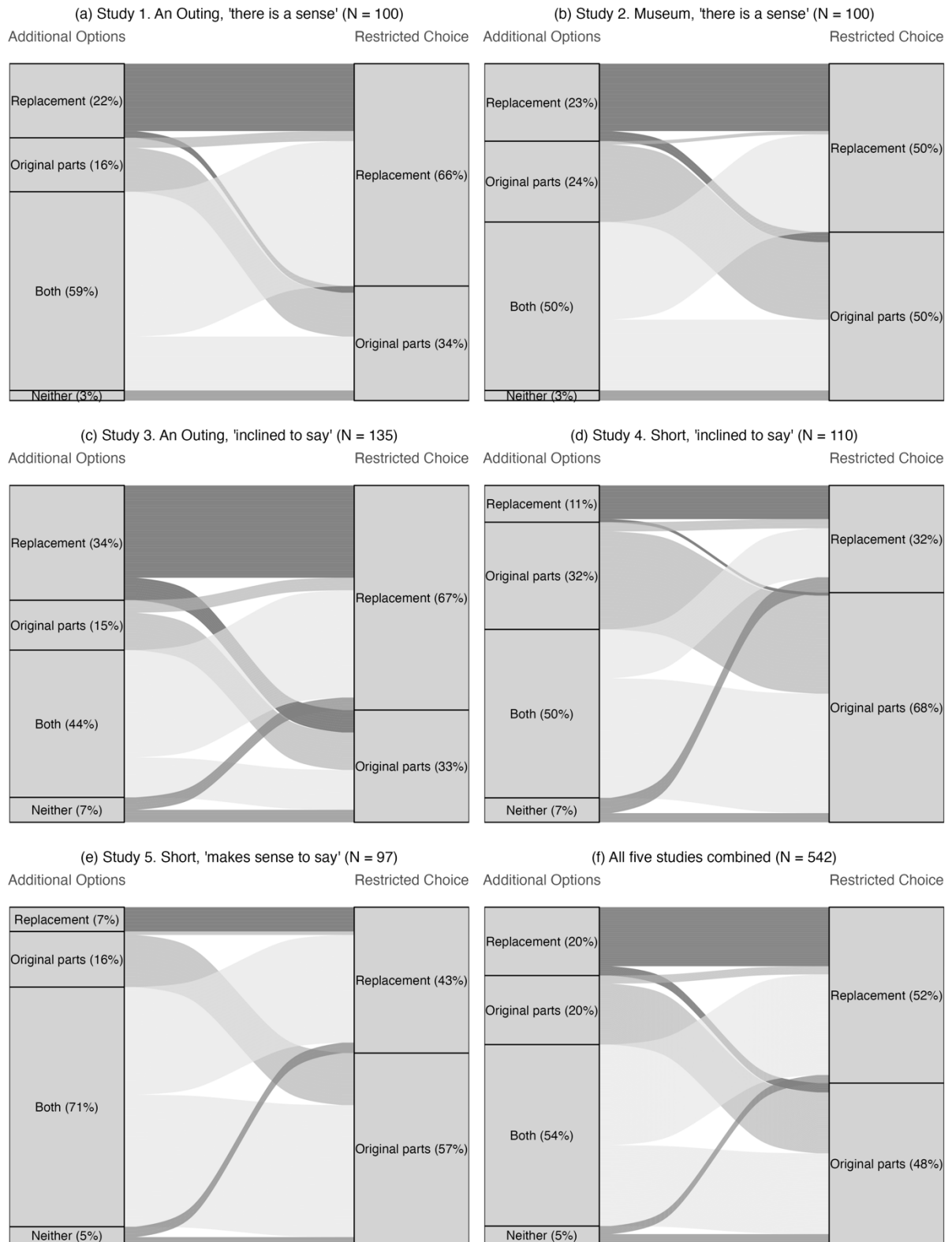


Figure 1. Alluvial charts of responses to the *Additional Options* question and the *Restricted Choice* question in (a) Study 1, (b) Study 2, (c) Study 3, (d) Study 4, (e) Study 5, and (f) all five studies combined.

Restricted choice. No clear pattern emerged in the *Restricted choice* question. In some studies, *Replacement* was the more frequent option, 67% in Study 3, $p < .001$, and 66% in Study 1, $p = .001$. In Study 4, it was *Original parts* that was more frequent, 68%, $p < .001$. No difference was observed in Study 2, 50% of *Original parts*, $p = 1$, and in Study 5, 57% of *Original parts*, $p = .187$. Study participants were relatively confident in their responses ($70\% \geq Mdn \geq 75\%$). No differences in certainty ratings between response options were observed in Studies 1-4, Wilcoxon rank sum tests, all $ps > .37$. In Study 5, a statistically significant difference in confidence ratings was observed, $Mdn_{Replacement} = 60\%$, $Mdn_{Original parts} = 75\%$, $p = .004$.

Comparisons of confidence ratings for the two questions. Confidence ratings were higher for *Additional Options* than for *Restricted Choice* in Study 1 ($p = .020$, $Mdn = 80\%$ vs. $Mdn = 75\%$) and Study 2 ($p = .004$, $Mdn = 80\%$ vs. $Mdn = 75\%$). Still, this difference was not observed in the remaining three studies (all remaining $ps > .05$). In four of the studies (Studies 1, 2, 3, and 5), confidence ratings for the *Restricted choice* were associated with the answer selected in *Additional Options*, all $ps < .02$ (but not in Study 4, $p = .190$). In all these cases, the difference was primarily driven by participants who chose *Both* in *Additional Choice*. For example, in Study 1, participants who chose *Both* in *Additional Choice* were less confident while responding to *Restricted choice* ($Mdn = 65\%$) than those who previously chose *Replacement* or *Original parts* (both $Mdns = 90\%$).

Resolving Intrapersonal Ambiguity. Finally, how do participants who chose *Both* in *Additional Options* choose in *Restricted Choice*? The pattern differed in different studies, $\chi^2 (4, N = 292) = 33.2$, $p < .001$. Thus, while 71% of such participants opted for *Original parts* in Study 4, only 27% did so in Studies 1 and 3.⁷

⁷ *Gender differences.* No differences between men and women were observed in responses to either *Additional Options* or *Restricted Choice*, chi-squared tests, all $ps > .25$, for either of the two confidence evaluations, Wilcoxon rank sum tests, all $ps > .15$, in any of the five studies.

3. Discussion

Do readers of the Ship of Theseus story feel inclined to assert two prima facie inconsistent propositions? Across five studies that varied both in vignettes used and wording of response options ("there is a sense," "I feel inclined to say," "it makes sense to say"), *Both*—which was not available in the original study by Rose et al. (2020)—was consistently the most frequent response option (ranging from 44% to 71%). This provides initial support for *Ambivalence*.

Let us look at some examples of justifications provided by the participants who chose *Both*:

I completely get both sides. On the one hand, the one built from the old planks is physically Drifter—everything's literally identical, and it uses the parts from it. On the other hand, the maintained one has lived the life of John's boat and could be sentimentally considered as Drifter, with all the experiences and events it has been through. I've actually been in this predicament with my bicycle(s) haha (M, 21)

It really depends on whether the boat itself as a whole or the materials count as the boat. I remain unsure which should truly count but can totally see both points of view, so remain undecided (F, 36)

It can be argued logically that both boats are Drifter. The one built recently from the original planks has the old materials of Drifter, while the boat with replaced planks is also connected to the original Drifter over years of gradual replacement. You cannot argue that one is Drifter and the other is not (M, 51)

Explicit expressions of ambiguity and puzzlement were quite common in such justifications, including "I'm not sure really. I just feel they both are," "It's really difficult," "Very tricky," "I think there is no black and white definitive answer," "this one fizzled my brain."

In addition to dominant responses expressing *Ambivalence*, there were less frequent responses that did not suggest *Ambivalence* and opted for either one or the other principle.

Continuity of form:

Obviously, it is the boat that has always been Drifter. Despite any changes or upgrades, it will always be Drifter. (F, 34)

The act of replacing parts does not mean a new item has been built. (M, 49)

The original rowboat is called Drifter; even though it has changed in its entire make-up, it's still Drifter. The rowboat made a month ago is made out of Drifter but it's not Drifter (F, 30)

If it had been replaced in one go, it wouldn't be Drifter, but a slow replacement kept its identity. (M, 40)

Continuity of matter:

As it's the same planks of wood that made the original Drifter, really it is the original Drifter. (F, 37)

I agree with Andy, as the boat is exactly the same as it was when first built 30 years ago, same planks and everything. In my mind, its like taking an engine apart to clean it, it's the same engine before being taken apart and after being put back together. (M, 24)

Even though planks have been replaced, it is the original planks that make-up Drifter. (M, 27)

The gradual nature of change was usually considered to be an illustration of continuity, with analogies to repair, biological growth, or surgical procedures, as in "if we replace a hip or knee or an organ... we are still the same person" (F, 29), "cells within our body change

completely within 7 years... yet we are still classified as the same person." (F, 39) or "It's like owning a car and then slowly repairing it and replacing things, it's still the same car" (F, 49).

In several cases, however, the gradual nature of change was taken to demonstrate the opposite:

[The case is analogous] to pop and rock groups: personnel changes over the years until not one original member is left. Therefore, a group that comprises no original members and does not have the singer who recorded the original songs is simply a covers band. (M, 66)

Because it could be argued that replacing something bit-by-bit results in it becoming something completely different, therefore both people have a case. (M, 22)

In addition to the continuity of form and matter, one other criterion stood out – study participants sometimes referred to the continuous engagement with the rowboat. Examples include: "its experiences of the boat and the time spent on it over the years that gives its character" (M, 35), "all the hard work and love [...], memory and nostalgia" (F, 41), "history of use and wear" (F, 25). This could potentially be another criterion that plays an important part in folk reasoning about the identity of artifacts.

Finally, in addition to explicit references to the persistence through gradual replacements, there were also some references to persistence through disassembly and reassembly, as in

If the boat were being sent by post and were disassembled, transported, then reassembled, it would still be the same boat. The fact that it was done gradually and the parts were used for something else in the meantime is irrelevant. (M, 21).

Folk ontological pluralism. Available empirical research suggests that the folk are flexible in their thinking about sameness and identity. For instance, Sarah Weaver and John Turri (2018) report several studies where people judged that the same person existed simultaneously in two different places. In the present studies, however, written

justifications did not include any suggestions of this type, namely that Drifter is simultaneously in two places. Hannah Tierney, on the other hand, reports a set of studies suggesting that "ordinary thought contains two concepts of persisting persons, each responsible for a separate set of intuitions, *both of which* are canonical conceptions and need not exclude the other" (2020: 154; See also Sider, 2001; Tierney et al., 2014).⁸ Even though they deal with artifacts rather than persons, current results paint a similar picture. The most popular response was, "There is a sense in which one rowboat is Drifter, and there is a sense in which the other one is Drifter." Written justifications provide evidence that participants were quite comfortable articulating those different senses.

Entities other than artifacts. While I limited my discussion to the Ship of Theseus story as it concerns the persistence of artifacts, such as rowboats, it remains to be seen if *Ambivalence* is also true of versions of the story concerned with entities other than artifacts. While philosophers took the story of the Ship of Theseus to provide a telling analogy for discussions on the persistence and growth of plants, animals, and human beings, it is Plutarch's (one resultant entity) rather than Hobbes' (two resultant entities) version that is most relevant here. However, a version with two resultant entities can also be constructed (e.g., a version of a teletransportation story in which the original entity is initially gradually disintegrated during the making of a copy, but later the original matter is used to reconstruct an entity), and one perhaps can expect that *Ambivalence* would also hold in such cases.

Hierarchy. Campdelacreu and her colleagues raise the possibility that "there is a hierarchical order between the principles that govern identification and reidentification of objects" (2020: 7). We can look into this possibility by checking how participants who initially indicate *Both* resolve it when asked to make *Restricted Choice*. No clear pattern emerged.

⁸ See also a note by Frank Ramsey (1991: 67–68): "So it is with "me"; its definition involves 3 elements, physical identity, memory and temporal continuity of experience each of which might be made the basis of an exact or rather a more exact concept. We use the word sometimes vaguely, sometimes definitely in one sense or the other e.g. identity after death means memory; identity of a man who has lost his memory means primary physical identity."

Overall results provide no evidence that the two principles—continuity of form and continuity of matter—are hierarchically ordered.

Generalizability. While the present set of studies provides some evidence that *Ambivalence* is true of English speakers, it remains to be seen if this result generalizes to other languages (and thus whether *Universality* is true).

4. Conclusion.

Based on a large cross-cultural study, Rose et al. (2020) argue that the classic story of the Ship of Theseus is a genuine puzzle in that people who consider it feel inclined to assert two *prima facie* inconsistent propositions (*Ambivalence*). In response, Campdelacreu et al. (2020) argue that these data fail to support *Ambivalence*. In particular, the data show sharp *interpersonal* disagreement among different readers of the story of the Ship of Theseus, but they fail to demonstrate an *intrapersonal* conflict or indecision. Should *intrapersonal Ambivalence* be demonstrated, this, according to Campdelacreu et al. (2020), would be a good indicator of the presence of a puzzle. Studies reported in the present paper provide direct empirical evidence for *intrapersonal Ambivalence* about the Ship of Theseus story. This gives reasons to claim that the story of the Ship of Theseus is a genuine puzzle.

Acknowledgments Earlier versions of this chapter were presented at the (E)SPP 2022 conference in Milan and during an internal seminar at the Centre for Philosophy of Memory at Université Grenoble Alpes. I am thankful to the attendees for their feedback.

Funding This research has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program [grant agreement 805498].

Data availability Study materials, data, and analysis code are available on *Open Science Framework* (<https://osf.io/en549>).

Competing Interests The author have no financial or proprietary interests in any material discussed in this article.

Ethics approval Approval was obtained from the Committee for Ethics of Scientific Research, Institute of Philosophy, Jagiellonian University. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

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