



## What does Labor Mixing Get You?

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*The first person who, having enclosed a plot of land, took it into his head to say “this is mine,” and found people simple enough to believe him, was the true founder of civil society.*

—Rousseau

How does one come to acquire property, that is, rightful ownership in something that was previously unowned and, by so doing, exclude all others from its rightful use? The distinction between mine and thine also creates the distinction between use and theft and, as Rousseau noted, is the true source of human inequality (1755, 69). One prominent answer to this question is that one can rightfully acquire ownership of something that was previously unowned by improving it through one’s labor. One can come to own an unowned plot of land, for instance, by farming or building on the land. The classic philosophical source for this view is Locke’s *2nd Treatise on Government*. There, Locke argues that since we own ourselves and our labor, once we “mix” our labor with a thing, we make it our own.

The labour of his body, and the work of his hands, we may say, are properly his. Whatsoever then he removes out of the state that nature hath provided, and left it in, he hath mixed his labour with, and joined to it something that is his own, and thereby makes it his property. It being by him removed from the common state nature hath placed it in, it hath by this labour something annexed to it, that excludes the common right of other men: for this labour being the unquestionable property of the labourer, no man but he can have a right to what that is once joined to, at least where there is enough, and as good, left in common for others.

(Locke 1681, §27)

Leaving aside the so-called “Lockean proviso” about leaving “enough, and as good” in common for others, the basic idea seems to be that once someone has labored and improved something, for another to use it without their consent would be

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equivalent to that person stealing their labor. Recent research on lay intuitions about ownership supports this Lockean claim; people do indeed think that labor mixing generates rightful ownership (e.g., Kanngiesser and Hood 2014; Rochat et al. 2014; Levene, Starmans, and Friedman 2015). In this chapter, we explore a more subtle question about ownership and labor mixing—namely, does mixing one’s labor with an object entail ownership of that object and if so, to what extent and under what circumstances?

In modern political philosophy, one of the earliest ideas about rightful acquisition of property is the First Possession Theory. On this view, one comes to rightfully own an object by virtue of being the first one to possess it (e.g., Pufendorf 1673). There is some evidence that lay subjects also regard first possession as sufficient for ownership (Friedman 2008). However, as we review below, several studies have pitted first possession against mixed labor, and in the studies, labor mixing seems to be a more powerful determiner of judgments of rightful possession. For instance, a cross-cultural (US, China, Vanuatu, and Brazil) developmental study on intuitions about ownership found that people’s judgments about rightful ownership are more strongly determined by labor mixing than by other candidate principles, like first possession (Rochat et al. 2014). In this study, one condition tested judgments of rightful possession in a circumstance involving “first contact,” where one child sees the object first and calls out, but the other child touches it first. Contrary to the author’s predictions, across ages and culture, children responded at chance as to whether the person who first touches the object was the rightful owner (478, 480). Rochat and colleagues also included a labor-mixing condition in which one child creates a toy; this child ends up in a dispute with another child about who owns the toy. In that case, there was a pronounced effect: five-year-old children, across cultures, tended to attribute ownership to the creator (477).

One potential drawback to the Rochat et al. study is that it evaluated labor mixing and first possession in separate conditions. In contrast, Levene and colleagues (2015) pitted first possession against labor-mixing in a single condition using a clever manipulation. Participants were presented with the following vignette:

People sometimes visit a local landfill looking for things that can be salvaged and sold. Mike is on a large hill at the landfill. He sees a big metal can 20 feet away. Mike decides to crush it into an ashtray. However, crushing the can just right won’t be easy. He picks up a heavy rock, walks a little bit closer, and throws it at the can. The rock crushes the can into an ashtray! Mike walks towards the ashtray. Before he reaches it, another man named Dave runs over and picks it up. The two argue about who gets to keep the ashtray.

Participants were then asked, “who does the ashtray belong to?”

(Levene et al. 2015, 105)

Participants tended to say that the ashtray belong to the agent when he succeeded in making it an ashtray, but not when he didn’t (105). Summarizing the studies, the authors write, “Participants ascribed ownership to agents who successfully created, but were less likely to ascribe ownership to agents who modified objects but failed to create” (108).

These studies all suggest that putting labor into an object exerts a powerful role in lay intuitions about ownership. But what exactly comes to fall under the laborer's ownership? Robert Nozick suggests that perhaps what one comes to own is the value that was added to the object, but not necessarily the object itself. He writes:

Perhaps the idea ... is that laboring on something improves it and makes it more valuable; and anyone is entitled to own a thing whose value he has created. ... Ignore the fact that laboring on something may make it less valuable (spraying pink enamel paint on a piece of driftwood that you have found). Why should one's entitlement extend to the whole object rather than just to the *added value* one's labor has produced?

(Nozick 1974, 175)

The question here is of some philosophical significance. Theories of property are supposed to give an account of rightful acquisition of an object, not simply rightful acquisition of the value added by one's labor. What do people do that secures their rightful possession of whole objects, like animals, minerals, and tracts of land? Nozick is pointing out that without further elaboration, the labor mixing theory does not explain why mixing one's labor with an object would yield rightful acquisition of the entire object.

In cognitive science, of course, we are not doing fundamental normative political philosophy. We are not directly determining the correct conditions under which a person gains rightful possession of an object. But many of the arguments that political philosophers use in these debates draw on our intuitions about cases. Both Locke and Nozick, for instance, appeal to intuitions about the plausibility of cases as evidence. Since those intuitions likely depend on broader common-sense intuitions, which, in turn, are related to the beliefs about the legitimacy of actual political institutions, it's worth investigating common-sense intuitions on the matter. In the following three preregistered<sup>1</sup> studies, we explore intuitions about labor mixing. In particular, we examine people's judgments that bear on whether mixing one's labor with an object generates rightful possession of the whole object.

## Study 1

To address Nozick's question, we need to see if people judge there to be a difference between the value added to something by one's labor and ownership of the object as a whole. We can investigate this issue first by capitalizing on earlier work on mixed labor. Across several studies, Kanngiesser and Hood (2014) investigated the role of value in intuitions about labor mixing and ownership. They use the following kind of vignette:

Mary owns some [material]. Sarah takes the [material] and [turns it into a piece of artwork]. Mary likes the [artwork/materials] and wants to keep it. Sarah also likes the [artwork] and wants to keep it.

(355)

Participants were asked, “who owns the artwork” (355). The study varied the value of the material involved. They found that when the material was not very valuable (e.g., clay), people were more inclined to attribute ownership of the artwork to the artist than they were when the material was quite valuable (e.g., gold) (356). This suggests that labor mixing does matter for ownership but is qualified by the antecedent value of the object.

In these studies, at least when the value of the material is low, participants tend to say that the artwork belongs to the person who made the artwork rather than the person who owned the material. Kanngiesser and Hood (2014) also included a control condition, in which the second agent “looks at” the material, and there is no mention of labor mixing. Not surprisingly, in that condition almost no one said that the material belonged to the agent who merely looked at it. Note that in this study, participants are only asked who owns the material in a condition where there is no artwork. In our study, we simply ask all participants both questions—we ask who owns the artwork and who owns the material. This allows us to explore whether the rightful possession of the artwork entails the rightful possession of the whole object, including the material.

## **Methods**

### ***Participants***

For the study 150 participants were recruited on Prolific: 70 female, 78 male, 2 participants indicated “other.” Mean age = 26.6. Seven participants missed the attention check, leaving  $N = 143$  participants for analysis.

### ***Design, Materials, and Procedure***

The study has a within subjects design with two conditions, corresponding to two dependent variables. Participants were presented with the primary vignette from Kanngiesser & Hood (2014, 355). Their study showed that the value of the material mattered, and only when the material was of low value did participants attribute ownership of the artwork to the artist. Hence our vignette used only a low value material. The full vignette is:

Mary owns some clay. Sarah takes the clay and turns it into a piece of artwork.  
Mary likes the artwork and wants to keep it. Sarah also likes the artwork and wants to keep it.

Following this, participants were asked two questions about rightful possession:

Who owns the clay?

Who owns the artwork?

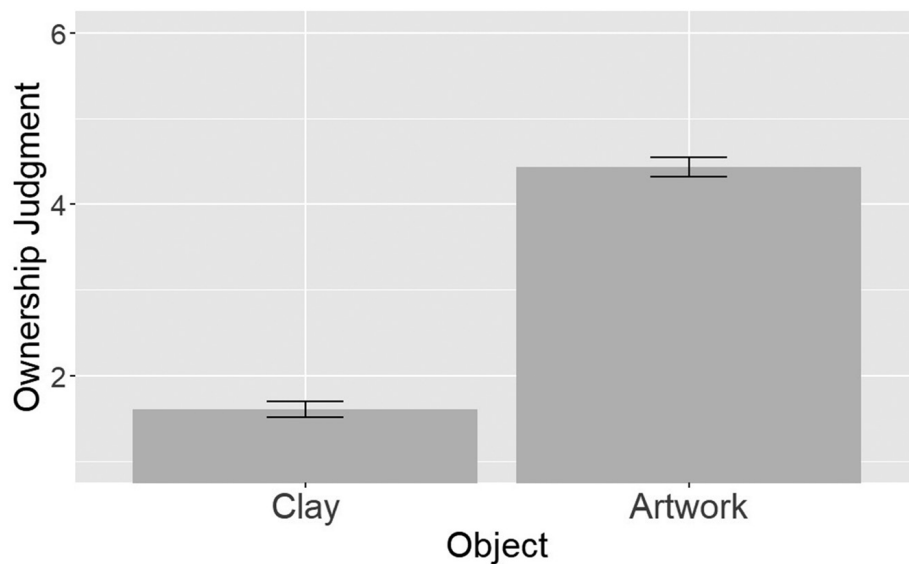
Responses were given on a 1 (Definitely Mary)–6 (Definitely Sarah) scale. The order of the questions was randomized.

Following responses to the two DVs, participants were asked to explain their answer, and then were given a basic attention check in which they had to indicate disagreement with the statement: “March comes before April alphabetically” (1—Strongly disagree, 6—strongly agree). Following our preregistration, the seven participants who failed this attention check were excluded from analysis.

**Results and Discussion**

Participants were significantly more likely to say that the artwork belonged to the agent who contributed labor ( $M = 4.34$ ) than that the clay belonged to that agent ( $M = 1.61$ ) ( $t(142) = 18.8, p < .0001, \text{Cohen's } D = 1.57$ ). Indeed, as is evident from Figure 4.1, participants tended to say that the artwork belonged to the agent who contributed labor and the clay belonged to the other agent.

These results indicate that people don't make a direct inference that mixing one's labor with an object yields rightful possession of that object. Even though Sarah is said to own the artwork, she is not said to own the clay out of which the artwork is made. This is a rather striking position. The artwork is composed out of the clay, and participants maintain that the clay belongs to one person and the artwork belongs to another. Thus, producing an artwork does seem to be sufficient for generating the intuition that one owns the artwork. But it is not sufficient to generate the intuition that one thereby owns the material.



**Figure 4.1** Average ownership scores in Study 1, with error bars reflecting the standard error of the mean. Scale from 1 (Definitely Mary [the original owner of the material]) to 6 (Definitely Sarah [the person who contributed labor to produce the artwork]). © Shaun Nichols and John Thrasher.

## Study 2

In the previous study, we found that in a case of transfer of ownership, participants tend to think that mixing one's labor with an object generates ownership of the product of that labor but does not generate ownership of material on which that labor was conducted. This shows that participants are sensitive to the distinction that Nozick makes. That is, they recognize the difference between owning the value one adds to an object and owning the object itself. But Study 1 doesn't directly test whether this judgment holds in cases of unowned objects since the clay in Study 1 is already owned by Mary. In our second study, we want to investigate the issue in the context of something more closely resembling the original acquisition of unowned objects.

### Methods

#### *Participants*

For this study, 150 participants were recruited on Prolific: 58 female, 91 male, 1 participant indicated other. Mean age = 27.7. Five participants missed the attention check, leaving  $N = 145$  participants for analysis.

#### *Design, Materials, and Procedure*

The study has a within subjects design with two conditions, corresponding to two dependent variables. Participants were presented with the following vignette:

Mark is a painter, hiking in some uncharted territory. He is struck by the silhouette of a hawk and looks around for materials to capture it. He sees a rock with a flat side near the river and uses some clay from the riverbank to sketch the silhouette on the rock. He's very pleased with the result. He doesn't have room in his pack to take it with him but plans to return the next day to get it.

The next day, John is hiking in the same area and sees the same rock. He doesn't see the side that Mark's drawing is on. But John notices that the rock has a small amount of silver in it, and estimates it's worth around \$80. He picks up the rock to take with him.

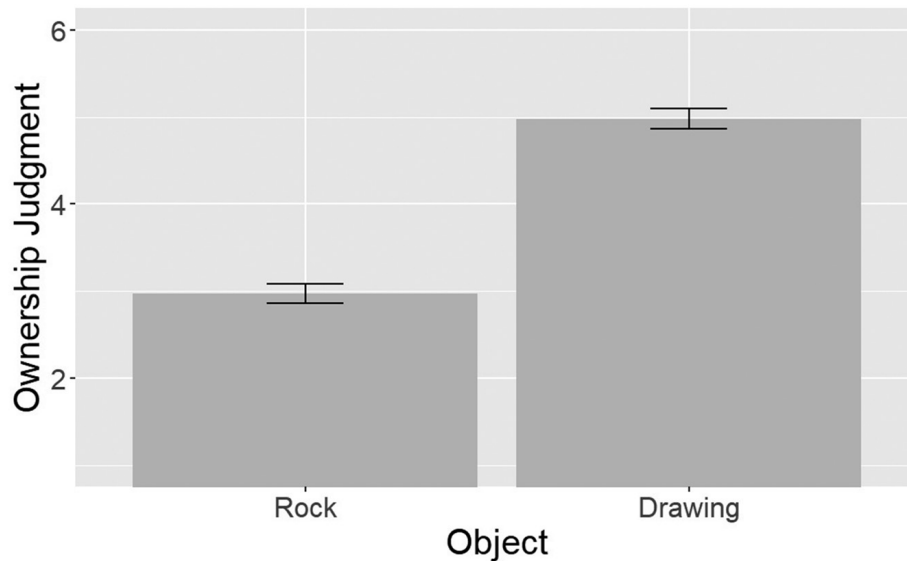
Mark arrives at this point and sees John with the rock that has his drawing on it.

Following this, participants were asked two questions about rightful possession:

Who does the drawing belong to?

Who does the rock belong to?

Responses were given on a 1 (Definitely John)–6 (Definitely Mark) scale. The order of the questions was randomized.



**Figure 4.2** Average ownership scores in Study 2, with error bars reflecting the standard error of the mean. Scale from 1 (Definitely John [the person who picked up the rock]) to 6 (Definitely Mark [the person who contributed labor to produce the drawing]). © Shaun Nichols and John Thrasher.

Following responses to the two DVs, participants were asked to explain their answer, and then were given the same attention check as in Study 1. Following our preregistration, the five participants who failed this attention check were excluded from analysis.

### Results and Discussion

Participants were significantly more likely to say that the drawing belongs to the agent who contributed labor ( $M = 5.0$ ) than that the rock belonged to that agent ( $M = 2.97$ ) ( $t(144) = 12.68$ ,  $p < .0001$ , Cohen's  $D = 1.05$ ). Indeed, as is evident from Figure 4.2, participants tended to say that the drawing belonged to the agent who contributed labor and the rock belonged to the other agent.

As in Study 1, we found that people distinguish between ownership of the value that was added to the object (the drawing) and the object itself (the rock). While participants said that the artist retained rightful ownership of his drawing, they did not extend rightful ownership to the whole object. Once again this suggests a significantly nuanced view about the relation between labor mixing and rightful ownership.

## Study 3

In the previous study, we found that even in the context of something resembling original acquisition, participants show a divided verdict, such that a person who mixes

his labor with an object might thereby own the value he added to the object without coming to own the object itself. But this might seem a little paradoxical. How can one person own the drawing on a rock and another person own the rock itself? In our final study, we investigate how people would resolve this apparent conflict. Participants are presented with the scenario much like that in Study 2, and we explored how participants who rendered a split verdict on ownership would prefer to resolve the conflict.

## **Methods**

### ***Participants***

For this study 150 participants were recruited on Prolific: 95 female, 54 male, 1 participant indicated other. Mean age = 24. Twenty-four participants were excluded for missing the attention check.

### ***Design, Materials, and Procedure***

All participants were presented with the following vignette:

Gary is a sculptor, hiking in some uncharted territory. He is struck by the beauty of a vista. He finds a rock and uses some tools to chisel out a detailed and subtle depiction of the scene. He's very pleased with the result. He doesn't have room in his pack to take it with him but plans to return the next day to get it.

The next day, Eric is hiking in the same area and sees the same rock. He doesn't see the side that Gary's sculpture is on. But Eric notices that the rock has a small amount of silver in it, he picks up the rock and estimates the silver is worth around \$80. He sets the rock down to open his pack to put the rock in it.

Gary arrives at this point and sees Eric and the rock with the sculpture he made.

Following the vignette, participants were asked to assign ownership for the sculpture and for the rock:

Who would you say the sculpture belongs to?

Gary

Eric

Who would you say the rock belongs to?

Gary

Eric

Finally, participants were asked the question of interest, regarding how to resolve a conflict in ownership.

Which of these do you think is the most appropriate thing to happen with this rock that has the sculpture on it:



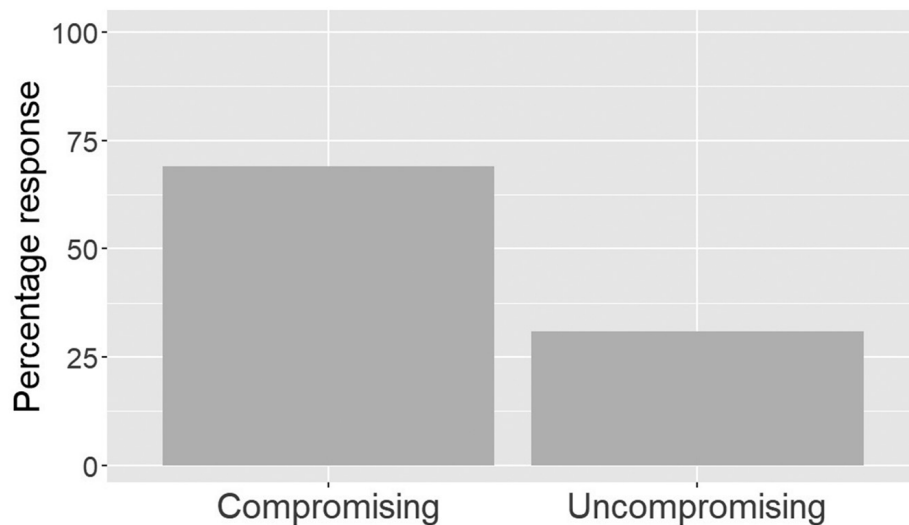
- Gary gets to keep it
- Eric gets to keep it
- Gary gets to keep it after giving Eric some money
- Eric gets to keep it after giving Gary some money

They were asked to select one of the above options, which were counterbalanced for order.

Following responses to this question, participants were given the same attention check as in Study 1. Following our preregistration, the twenty-four participants who failed this attention check were excluded from analysis.

**Results and Discussion**

A majority of participants (67/126) rendered a split verdict on ownership. That is, they maintained that the sculpture belonged to the first person, and the rock belonged to the second person. Following our preregistration, we collapsed the responses to the resolution dependent measure into two categories. One category (“Compromising”) included both options in which one person gets to keep the object after paying the other person money; the other category (“Uncompromising”) included both options in which ownership was simply assigned to one person. The number of participants who selected a Compromising response ( $N = 46$ ) was greater than the number of participants who selected and Uncompromising response ( $N = 21$ ) (see Figure 4.3). Following our preregistration, we conducted chi-square goodness of fit test, which revealed a significant difference from what would be expected by chance ( $\chi^2 = 9.3284$ ,  $df = 1$ ,  $p\text{-value} = 0.002$ , Cramer’s  $V=.37$ ).



**Figure 4.3** Percentage response in each category in Study 3 © Shaun Nichols and John Thrasher.

## General Discussion

In political philosophy, it is a vexed question how an individual obtains rightful ownership of an object. Locke's labor mixing theory provides one of the most interesting and widely discussed accounts. According to the Lockean theory, I acquire an object by mixing my labor with it. One natural way to elaborate this theory is that the reason I acquire the object by mixing my labor with it is that my labor increases the value of the object. Empirical studies on lay judgments about rightful possession provide evidence that people do take labor mixing to contribute to rightful possession (e.g., Kanngiesser and Hood 2014; Levene et al. 2015; Rochat et al. 2014).

As we saw above, Locke argues that insofar as one mixes one's labor with an object that is clearly not owned by someone else (i.e., it is in the commons), then it becomes one's legitimate property. We can agree with Locke that it certainly does seem intuitive that, *ceteris paribus*, I own the fruits of my labor. However, insofar as the object itself is not the fruit of my labor, does my increasing the value of the object entail that I thereby acquire rightful ownership of the object? Locke seems to think so, but recall Nozick's astute question. Why don't I just own the value added to the unowned object, rather than the object itself? Our studies indicate that people are more Nozickian in this sense than Lockean: they do not infer directly from labor mixing to rightful ownership of an object. Nevertheless, the core Lockean insight remains since our studies confirm previous results that by mixing my labor with an object, I come to own *something*. In particular, I come to own that which I created. But the act of creation itself does not necessarily transfer or secure the ownership of the object itself. By making a sculpture out of clay, I come to own the sculpture, but the ownership of the clay does not follow necessarily.

Previous work shows that ordinary intuitions about rightful acquisition cannot be captured by a simple first possession theory (e.g., Friedman 2008). Our current results show that neither can a simple labor mixing theory capture ordinary intuitions about rightful acquisition. The principles that underlie our ordinary judgments about rightful ownership seem to be more complex and disparate. There is some reason to think that territorial instincts contribute to judgments of rightful ownership (cf. Gintis 2007). However, these innate factors do not fully determine the set of principles that govern our intuitions about rightful ownership. Rather, principles of rightful ownership plausibly depend on the cultural emergence of conventions regarding ownership (pace Gintis 2007). Given the bumpy path of cultural development, it shouldn't be so surprising if it turns out that there is no simple principle that underlies ordinary judgments of rightful acquisition.

Our findings here suggest one way that critics and defenders of the Lockean labor mixing might use empirical methods to make philosophical progress. Some have argued, for instance that the Lockean theory of property as a whole is incompatible with the labor mixing theory of original acquisition (Kogelmann 2021). Others argue that original appropriation in the Lockean sense is more about individuating rather than justifying property rights (van der Vossen 2009). Understanding the relationship between judgments about value and ownership will surely shed some light on these

and other debates. More studies along the lines that we have presented here will be needed to decisively settle many of these questions, but there is little reason to think that they can be easily settled without the kind of empirical testing that we do here.

## Note

- 1 Preregistration for Study 1 can be found here: <https://aspredicted.org/blind.php?x=xj7tt4>; preregistration for Study 2 can be found here: <https://aspredicted.org/blind.php?x=qn7dz4>; preregistration for Study 3 can be found here: [https://aspredicted.org/W1M\\_YL3](https://aspredicted.org/W1M_YL3).

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