



## Creation in judgments about the establishment of ownership<sup>☆</sup>



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### HIGHLIGHTS

- We examine the effects of creation and intent on ownership judged.
- We show that people judge that an agent who creates an object comes to own it.
- We show that creation establishes ownership even without first physical possession.
- We show that creation matters over-and-above the labor involved in creation.
- We show that creation leads to ownership even when it reduces object value.

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### ABSTRACT

In four experiments, we examine whether people judge that creators are accorded ownership of their creations. We find that people judge that an agent who creates an object comes to own it, and that this effect of creation holds even when controlling for other factors typically associated with ownership, including physical possession and labor. Experiment 1 shows that ownership is ascribed more to an agent who successfully creates than an agent who fails to create. Experiment 2 suggests that ownership is ascribed more when creation is intentional rather than unintentional. Experiment 3 then shows that creation matters over-and-above the labor involved in creation. Finally, Experiment 4 shows that creation leads to ownership even when new creations are worth less than the materials from which they are made. These findings are informative about people's decision-making about how new ownership is established, and broaden knowledge regarding the social implications of creation.

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We live in a world of human-made creations, from the shoes on our feet to the Great Wall of China. Without these creations, we would sip water from cupped hands, walk barefoot, and we would never experience the beauty of art. Given the importance of creations in our lives, it is fitting that creators are accorded privileged status in relation to their creations. In judging what a novel object is, people consider what its creator intended it to be (Bloom, 1996; Gelman & Bloom, 2000; Preissler & Bloom, 2008; but see Malt & Johnson, 1992). Creator's intent also affects judgments about what counts as art—people's decisions about whether an object should be treated as a work of art, rather than an ordinary artifact, depend on what the creator intended in making it (Newman & Bloom, 2012). Similarly, in deciding what an object is for, people also consider the function its creator intended it to have

(German & Johnson, 2002; Kelemen & Carey, 2007; Matan & Carey, 2001).

Creators might also be privileged through ownership. People may judge that by creating an object, an agent establishes ownership of it. Such judgments would give creation moral significance because people recognize and respect each other's ownership rights, and chastise and punish individuals who violate ownership rights. These judgments might likewise motivate people to create because they ensure that creators can use and benefit from the things they make; put in reverse, if creation did not establish ownership there might be little incentive to create, as others would be free to deprive creators of the products of their labor.

Discovering whether people judge that creation establishes ownership is important for understanding how people reason about ownership. Ownership is an important aspect of our representation of objects, and has wide-ranging effects on people's thinking about objects. For example, it affects how accurately objects and their locations are remembered, how they are physically handled, and even how people refer to them (e.g., Constable, Kritikos, & Bayliss, 2011; Coventry,

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Griffiths, & Hamilton, 2014; Cunningham, Turk, Macdonald, & Macrae, 2008). However, until recently little empirical work actually investigated it (for recent reviews see Blumenthal, 2010; Nancekivell, Van de Vondervoort, & Friedman, 2013).

### 1. Establishing ownership

Examining whether people judge that creation establishes ownership is informative about their causal judgments about how new ownership is established. Theories of ownership often posit that a person's ownership of an object depends on the person's history with the object.<sup>1</sup> Two historical activities have been claimed to lead to new ownership: Some theorists posit that ownership is established by laboring on a non-owned thing (George, 1893; Locke, 1690/1978), and others claim it is established when a person is first to take physical possession of an object (i.e., first to have direct physical contact with the object, and control of it; Epstein, 1979; Rose, 1985; Stake, 2004).<sup>2</sup> Lay people may judge that ownership is established via either of these activities (Friedman, 2008, 2010; Kanngiesser, Gjersoe, & Hood, 2010; Kanngiesser & Hood, 2014; Palamar, Le, & Friedman, 2012; Shaw, Li, & Olson, 2012; Verkuyten, Sierksma, & Thijs, 2015). For instance, rather than assigning ownership to an agent who is first to see or pursue an object, people typically assign ownership to an agent who labors to make the object available (Friedman, 2010) or is first to physically possess it (e.g., Friedman, 2008; Shaw et al., 2012). Further evidence that people link physical possession with ownership comes from findings showing that consumers have greater feelings of ownership over products they physically touch, compared with those they merely view (Peck & Shu, 2009).

If people think that creation establishes ownership, this could support both of these accounts of how ownership is established. Creating something requires laboring on it, and the creator of an object is typically the first person to physically possess it (Dukeminier, Krier, Alexander, & Schill, 2010). So both accounts predict that the creator of an object should own it. However, people might think that creation establishes ownership over-and-above labor and first possession: The very same labor may be seen as resulting in creation or not resulting in creation, depending upon one's judgment of the resulting object. Also, it is possible to create without being first to physically possess the raw materials or the final creation. If people think that creation establishes ownership over-and-above the contributions of labor and first possession, this will suggest that creation is a distinct method of establishing ownership.

### 2. Existing findings

Some previous findings suggest that people may judge that creation establishes ownership. Participants in Beggan and Brown (1994) read a story about a boy who either played with a tree branch or carved it into the shape of an airplane. He then left the branch where he found it, and returned later to find it in someone else's possession. Participants were more likely to claim the boy owned it when he carved the branch into an airplane, compared with when he simply played with it. This finding suggests that people judge that creation establishes new ownership. However, rather than showing sensitivity to creation itself, participants could also have based their judgments on other factors that typically co-occur with creation, such as labor on the object, and time and effort invested in it.

<sup>1</sup> This claim is also supported by developmental studies show that children consider objects history in their ownership judgments (e.g., Friedman, Van de Vondervoort, Defeyter, & Neary, 2013; Gelman, Manczak, & Noles, 2012; Gelman, Noles, & Stilwell, 2014; Nancekivell & Friedman, 2014).

<sup>2</sup> Our discussion of possession principally concerns the claim that taking physical possession of a non-owned object establishes ownership over it. However, people may also use possession as a cue for inferring who owns an already owned object when this is ambiguous (e.g., Blake & Harris, 2009; Blake, Ganea, & Harris, 2012; Friedman, 2008; Friedman et al., 2013; Kanngiesser, Rossano, & Tomasello, in press).

Similar issues arise for investigations suggesting that preschool-aged children judge that creation establishes ownership (Nancekivell & Friedman, 2014; Rochat et al., 2014). For instance, Rochat and colleagues found that five-year-olds from seven different cultures attributed ownership of an object to the agent who created it. However, as Rochat et al. acknowledge (p. 480), creation typically implies prior possession and manipulation of the object, so it is difficult to be sure whether children's ownership judgments were based on creation itself, rather than on these other factors.

Some other studies have investigated effects of creation on ownership in the context of transfers of ownership (Hook, 1993; Kanngiesser & Hood, 2014; Kanngiesser, Itakura, & Hood, 2014; Kanngiesser et al., 2010). These studies featured situations where one agent originally owned materials, but a second agent used those materials to create something new. Although children often judge that ownership is transferred from the original owner to the creator (Kanngiesser et al., 2010), adults typically deny this (Hook, 1993; Kanngiesser et al., 2010). One study found that adults were more likely to affirm that ownership is transferred to the creator, when the creator invested considerable time, when the original materials were of low-value, and when the creator increased their worth (Kanngiesser & Hood, 2014). However, these judgments might not have depended on creation: The original owner did not protest when the creator took and modified the object, so participants might have felt that the original owner had abandoned it, or forfeited rights to it; consistent with this, adults' judgments about involuntary ownership transfers are affected by "open and notorious" use of another's property, outside the context of creation (Shotland & Hyers, 2000). More importantly for current purposes, because these findings concern transfers of ownership, they do not show that creation establishes new ownership.

### 3. Intent and ownership

If people judge that creation establishes ownership, their judgments might be influenced by the creator's intent. This might be expected for two reasons: First, intent impacts judgments about the establishment of ownership when agents labor to make inaccessible objects available (Palamar et al., 2012). For example, ownership is more likely to be ascribed to an agent who knocks a non-owned fruit out of a tree when this outcome was intended rather than unintended (Palamar et al., 2012). Such effects of intent could extend to creation.

Second, intent could impact ownership judgments by influencing people's judgments of creation. People are more likely to view objects as creations when they are made intentionally, rather than unintentionally (Bloom, 1996; Bloom & Markson, 1998; Diesdendruck, Markson, & Bloom, 2003; Gelman & Ebeling, 1998; also see Hawley-Dolan & Young, 2013). For example, children and adults refer to a bear-shaped blob of paint as a "bear" if it was painted intentionally, but instead refer to its constituent materials (i.e., "paint") if it was created accidentally (Gelman & Ebeling, 1998). If people deny that an agent who modifies an object without intent has created, they might also deny that it belongs to the agent.

### 4. The current approach

The current studies investigate whether people judge that creation establishes new ownership, and the effects of intent and value on these judgments. Following previous studies of principles underlying people's ownership judgments (e.g., Beggan & Brown, 1994; Friedman, 2008, 2010; Hook, 1993; Kanngiesser & Hood, 2014), we examined participants' judgments about third-party vignettes in which two characters each want an object. Participants read vignettes in which an "agent" saw and then acted on an object, sometimes with the consequence of creating a new object. Crucially, the agent acted without directly contacting the target—instead the agent threw something at it. For example, in some scenarios the agent threw a rock at a can, crushing

it to create an ashtray. The object (either the original object or a new creation) was then picked up by a different person, a “first possessor”. Of interest was whether participants would say that the object belongs to the agent or the first possessor, and whether these ownership judgments would vary depending on whether the agent created something.

Our scenarios are somewhat unusual because the agents acted on objects, but without touching them, or making any kind of direct physical contact with them. However, there are several advantages to using such scenarios. First, people normally create by acquiring materials and then physically modifying them. In such circumstances, ownership may be established before creation occurs—it may arise when the materials are first obtained or after they have been partially labored on. But creation cannot establish ownership if preceded by it (for discussion in relation to labor accounts more broadly, see Waldron, 1988, pp. 173–174). By having agents act without direct physical contact, we reduced the likelihood of participants viewing agents as owners prior to creation. Second, because agents were not first to physically possess their creations, this design allowed us to test whether people judge that creation establishes ownership even without first possession. Third, creating something typically involves considerable time, effort, and physical contact with materials. These factors could affect people's judgments independently of creation. For instance, evaluations of the monetary worth of creations increase when they were made in a “hands on” way, involving extended physical contact with the creator (Newman & Bloom, 2012). Using scenarios where agents threw objects at targets allowed us to hold constant these factors that are often associated with creation, so that we could examine the effects of creation itself.

## 5. Experiment 1

As a preliminary test of whether people judge that creation establishes new ownership, participants either read a scenario where an agent successfully creates or a nearly identical scenario where the agent fails to create. If creation establishes new ownership, participants should be more likely to ascribe ownership to the agent who succeeds in creating.

### 5.1. Method

#### 5.1.1. Participants

Sixty-three participants (ages 19–61 years) were tested. Data were excluded from an additional 23 participants who failed comprehension questions (see the Supplementary Materials for further information about excluded participants). In this experiment and in Experiment 2, participants were located in the United States, and were recruited and tested using the online platforms of Crowdfunder and Qualtrics, and were paid \$0.25 for approximately 3 min of their time. In both of these experiments, we initially aimed to test 40 participants per condition, but here included data from six extra participants who completed the survey before it expired.

#### 5.1.2. Materials and procedure

Participants read a story in which an agent tries to intentionally modify a non-owned object to create a new object, but without directly touching it. Participants either read a story version in which the agent succeeds or a version where the agent fails. After the agent's successful or unsuccessful attempt, a second character picks up the object, and they argue about who should keep it. Here is the story; text that differs between the two versions is in brackets.

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/dents the can, but does not crush it]! Mike walks towards the [ashtray/can]. Before he reaches it, another man named Dave

runs over and picks it up. The two argue about who gets to keep the [ashtray/can].

The story was followed by a test question asking, “Who does the [ashtray/can] belong to?” The names of both characters were listed as response options, with order of presentation randomized across participants. Participants then indicated their confidence in this response on a Likert scale, with response option ranging from 1 “not confident at all” to 5 “very confident”. Participants then answered four comprehension questions, asked to ensure they had carefully read the story. Here are the questions and their response options:

Who saw the can first? *Mike/Dave*

In the story, did Mike ever pick up the can? *Yes/No*

What was thrown at the can? *A rock/An ashtray/A shovel*

What happened to the can? *It was crushed/It was dented*

The test question appeared on the same screen as the story; the confidence scale appeared on a new screen, and the comprehension questions also appeared on a new screen. Following comprehension questions, demographic questions about participant age and gender appeared on a new screen. After accessing each new screen, participants were unable to return to previous screens. This basic procedure was used in all subsequent experiments. See the Supplementary Materials for full materials from all experiments.

## 5.2. Results and discussion

If participants hold that creation establishes ownership, they should be more likely to judge that the agent owns the object when creation succeeds rather than fails. To test this prediction, we combined responses from the test question and the subsequent confidence rating. We subtracted 0.5 from each confidence rating, and then multiplied the value by +1 for choices favoring the agent, and by –1 for choices favoring the first-possessor. This yielded a response scale ranging from –4.5 (maximum support for first-possessor) to +4.5 (maximum support for the agent who attempted to create). This method of deriving scores was based on Tenney, MacCoun, Spellman, and Hastie (2007) and was also used in all subsequent experiments.

Analysis of participants' scores showed that ownership was more likely to be attributed to the agent when creation succeeded ( $M = 2.16$ ,  $SD = 2.87$ ) compared with when it failed ( $M = -0.11$ ,  $SD = 3.49$ ),  $t(58.06) = 2.81$ ,  $p = .007$ , Cohen's  $d = 0.71$ . Ownership was attributed to the agent by 78% of participants (25 of 32) when creation succeeded, but by only 45% (14 of 31) when creation failed. These findings suggest that participants hold that successful creation establishes ownership, and that merely intending, and attempting to create is not enough to lead to ownership.

The next experiment examines the influence of intent on ownership judgments. Intent might be expected to influence such judgments because it influences ownership judgments when agents labor to make inaccessible objects available (Palamar et al., 2012), and because objects made unintentionally might not be viewed as creations at all (e.g., Gelman & Ebeling, 1998). To examine the influence of intent, we tested whether ownership judgments vary depending on whether an agent modifies an object with the intent to create or with a different intention. This experiment also used a vignette which made clearer that the first possessor only saw the object after it had been modified.

## 6. Experiment 2

### 6.1. Method

#### 6.1.1. Participants

One hundred and twenty-nine participants (ages 17–65 years) were tested. An additional 30 participants were excluded for failing comprehension questions.

### 6.1.2. Materials and procedure

Participants read a story in which an agent modifies a non-owned object, either with the intent to create a new object or without this intent. As in the previous experiment, a first-possessor then picks up the object, the two argue about whose it is, and participants judged which character owns it. A new cover story was used in which the agent throws paint at a wooden board, either because he wants to create, or just for fun. In the version where the agent splashes the board just for fun, the target object is described as a painted board.

We included two versions of the story where the agent intended to create. These versions varied in how we described the agent's intention and the product of his creation. The target object was either referred to as a "painted board" or as a "painting" (We included these versions to examine whether participants would be sensitive to how the target object was labeled in the scenarios and test question; this factor could have influenced responses in Experiment 1, because there the object was labeled differently depending on whether creation succeeded or failed.).

Here is the story; text varying between the three versions is in brackets.

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 an ugly wooden board. Mike picks up a half empty paint can and throws it at the board [to make a splatter painting/to make a painted board/just for the fun of it]. The paint splatters all over the board. The [painting/painted board] looks surprisingly good. Suddenly, a gust of wind causes the [painting/painted board] to roll down the hill. Mike wants the [painting/painted board]. Another man named Dave is walking at the bottom of the hill. He sees the [painting/painted board] on the ground and picks it up. When Mike reaches the bottom of the hill, they begin to argue about who gets to keep it.

The story was followed by a test question asking, "Who does the [painting/painted board] belong to?" and then by three comprehension questions (see the Supplementary materials for further details):

Who was standing on top of the hill? *Mike/Dave/Nobody*  
 What caused the board to roll down the hill? *A gust of wind/Mike pushed it/A landslide*  
 Why did Mike throw paint at the board? *Just for the fun of it/To paint the board*

### 6.2. Results and discussion

Scores varied across the three conditions, one-way ANOVA,  $F(2, 126) = 4.88, p = .009, \eta^2_p = 0.07$ . Participants were less likely to side with the agent when he did not intend to create ( $M = 0.93, SD = 3.68$ ) than when he intended to create a painting ( $M = 2.88, SD = 2.25$ ),  $t(81.6) = 2.04, p = .044, d = 0.45$ , or a painted board ( $M = 2.38, SD = 2.92$ ),  $t(71.8) = 2.98, p = .004, d = 0.70$ ; scores did not vary between the two conditions in which the agent intended to create,  $t(83) = 0.88, p = .381$ . The agent was chosen as the owner by 61% of participants (27 of 44) when he did not intend to create, by 79% of participants (34 of 43) when he wanted to create a painted board, and by 86% of participants (36 of 42) when he wanted to create a painting.

The experiments thus far suggest that people judge that creation establishes ownership, and that ownership is more likely to be ascribed to agents who create intentionally. However, the findings leave open the possibility that rather than being influenced by creation per se, ownership judgments were instead influenced by intentional labor. In all scenarios where the agent intentionally created, he also intentionally labored and physically modified the object. So it is unknown whether creation establishes ownership over-and-above the intentional labor and modifications to the object.

To examine this question, participants in the next study judged whether the agent truly created something or had instead merely modified an object. Although the scenarios stipulated that a new object was

created, we anticipated that some participants might not accept this—for example, they might reject the claim that splashing paint on a board really makes a painting. If creation establishes ownership over-and-above labor, then participants who affirm that the agent created should be more likely to view the agent as owner than participants who denied that creation actually occurred. The experiment also used two different cover stories to limit chances of findings being limited to a particular setting or type of creation.

## 7. Experiment 3

### 7.1. Method

#### 7.1.1. Participants

We tested 241 participants (ages 18–70 years) using the online platforms of Amazon's Mechanical Turk and Qualtrics. An additional 11 participants were excluded for failing comprehension questions. In this experiment we recruited a larger number of participant per condition (collapsing across storyline, which we had assumed would not impact findings), as a precaution: We knew that we wanted to separately analyze responses from participants who affirmed versus denied that the agent actually created. However, we were unsure what proportion of participants would fall into each group, and so we tested a larger group to guarantee both groups would be large enough to yield meaningful data; we took the same approach in Experiment 4.

#### 7.1.2. Materials and procedure

Participants were randomly assigned to read one of two cover stories. In the "painting" cover story, the agent throws a can of paint at a wooden board, as in Experiment 2, creating a painting. The "bowl" cover story was set in a forest, and the agent throws a rock at a fictitious object (a "torgo shell"), creating a bowl. Participants either read story versions in which the agent initially intended to create or did not act with this intent. In both story versions, the modified object was referred to as a "bowl" or "painting", depending on the cover story. As in the previous experiments, the stories ended with the first possessor picking up the object, and the two characters arguing over it.

After reading the story, participants answered an ownership question and gave a corresponding confidence rating, as in the previous experiments. After this, they answered a new question concerning whether the agent actually created something. The question asked which of two statements "best describes what Mike did in the story" and offered two response options—one for actual creation (e.g., "Mike created a bowl"), and the other indicating that the agent merely modified an existing object (e.g., "Mike put a hole in a shell"). The rest of the survey was structured as in previous experiments (i.e., comprehension and demographic questions; see Supplemental Materials).

### 7.2. Results and discussion

We first examined judgments about whether the agent was seen as having created an object or instead as having merely modified one. Preliminary analyses revealed that these judgments did not vary across the two cover stories, and so we collapsed by cover story. Participants were more likely to say that creation occurred when the agent intended to create (50% of responses; 60 of 121 participants) than when he did not (25% of responses, 31 of 120 participants),  $\chi^2(1) = 14.47, p < .001$ . These findings are broadly consistent with previous demonstrations that intent influences judgments about whether creation occurs (e.g., Gelman & Ebeling, 1998).

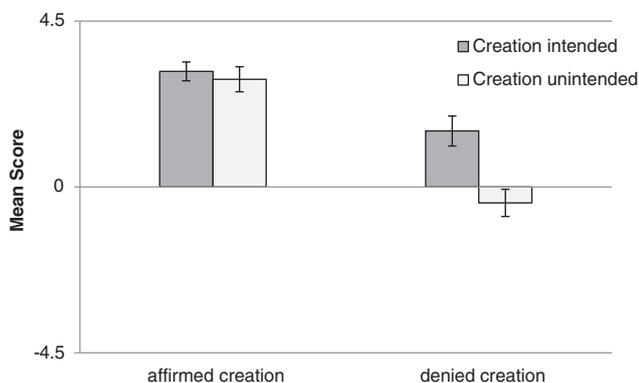
We next examined if ownership judgments were predicted by agent's intent and by participants judgments of whether the agent created. Scores were entered into a 2(cover story: bowl vs painting)  $\times$  2(intent: agent intended to create vs agent did not intend to create)  $\times$  2(creation judgment: participant judged item was created

vs participant judged item was modified) ANOVA. This analysis revealed a main effect of cover story, with participants more likely to side with the agent in the painting cover story ( $M = 2.14$ ,  $SD = 3.02$ ) than in the bowl cover story ( $M = 0.65$ ,  $SD = 3.34$ ),  $F(1, 233) = 15.21$ ,  $p < .001$ ,  $\eta^2_p = 0.06$ . However, this factor did not enter into any interactions (all  $p$ s  $> .5$ ), and so we do not consider it further.

The ANOVA also revealed main effects of intent,  $F(1, 233) = 7.52$ ,  $p = .007$ ,  $\eta^2_p = 0.03$ , creation judgment,  $F(1, 233) = 41.46$ ,  $p < .001$ ,  $\eta^2_p = 0.15$ , and an interaction between intent and creation judgment,  $F(1, 233) = 4.78$ ,  $p = .030$ ,  $\eta^2_p = 0.02$ . Participants who affirmed that the agent created were more likely to identify the agent as owner than participants who thought he just modified an object, both when the agent intended to create,  $t(100.62) = 3.37$ ,  $p = .001$ ,  $d = 0.67$ , and when he did not,  $t(96.55) = 6.68$ ,  $p < .001$ ,  $d = 1.36$ . However, the effects of intent on ownership depended on whether participants judged that the agent created (see Fig. 1). For participants who judged that the agent created, the agent's intent did not influence ownership judgments,  $t(89) = 0.497$ ,  $p = .621$ , and they strongly endorsed the agent as owner both when he intended to create ( $M = 3.13$ ,  $SD = 1.97$ ) and when he did not ( $M = 2.92$ ,  $SD = 1.89$ ). This might have resulted from a ceiling effect—of participants who affirmed that creation occurred, 92% (55 of 60) chose the agent as owner when he intended to create, and 94% (29 of 31) chose him when he did not intend to create. In contrast, participants who denied that the agent created were more likely to choose him as owner when he intended to create ( $M = 1.52$ ,  $SD = 3.18$ ) than when he did not ( $M = -0.43$ ,  $SD = 3.48$ ),  $t(136.41) = 3.55$ ,  $p = .001$ ,  $d = 0.61$ . Of these participants, 74% (45 of 61) chose the agent when he intended to create, and only 44% (39 of 89) chose him when he did not intend to create.

These findings suggest that people view creation as establishing ownership over-and-above the equivalent labor. Participants who judged that the agent created were more likely to ascribe ownership to him, than participants who read about the same labor and modifications to the object, but denied that a new object was created. The findings also suggest that creation matters for ownership regardless of intent. The findings relating to intent might seem to conflict with those of Experiment 2, because participants there chose the creator more when creation was intentionally than when it was unintentional. However, in that experiment we did not confirm whether participants believed that the agent truly created. So it could be that the effect of intent in that experiment was indirect: Intent might have increased perceptions that the agent created (as in the present experiment), and these creation judgments might have led to judgments that the agent created.

Although the findings so far suggest that people hold that creation establishes new ownership, an alternative account for the findings is possible. Rather than being sensitive to creation per se, participants



**Fig. 1.** Experiment 3. Mean ownership scores for participants who affirmed that the agent created and for those who denied this. Scores range from 4.5 (full support for the agent) to  $-4.5$  (full support for the first-possessor). Error bars represent one standard error of their respective means.

might have based their ownership judgments on assessments of value. Participants might have assumed that when the agent successfully created, he increased the value of the materials. If so, they could have assigned ownership to him because of this increase in value, and not because he created. (This account likewise implies that participants who denied that the agent created might have felt skeptical that he increased the value of the materials).

To examine this possibility, participants in the next experiment read vignettes in which the act of creation reduced the value of the materials—the creation was worth less than the materials from which it was made. If participants still assign ownership to the creator, this will show that their ownership judgments depend on creation, and not just on assessments of value.

## 8. Experiment 4

### 8.1. Method

#### 8.1.1. Participants

We tested 227 participants (ages 18–67 years) using the online platforms of Amazon Mechanical Turk and Qualtrics. An additional 24 participants were excluded for failing comprehension questions.

#### 8.1.2. Materials and procedure

The procedure was almost identical to that in Experiment 3. However, there were three changes in the present procedure: First, participants were randomly assigned to read a version of the “ashtray” or “painting” cover story. Second, the stories mentioned the monetary values of the original materials and creations. In both cover stories, the creation was worth half as much as the original materials. In the ashtray story, the can was worth \$50 originally, but only worth \$25 once it became an ashtray; in the painting story, the wooden board was worth \$100 originally, but only worth \$50 as a painting. Finally, the response options to the creation question were changed to “Mike created something” and “Mike merely modified an object”.

### 8.2. Results and discussion

We first examined judgments about whether the agent was seen as having created an object or instead as having merely modified one. Participants were more likely to say that creation occurred when the agent intended to create (41% of responses; 45 of 111 participants) than when he did not (15% of responses, 17 of 116 participants),  $\chi^2(1) = 19.14$ ,  $p < .001$ . This difference arose for both the painting story,  $\chi^2(1) = 13.39$ ,  $p < .001$ , and for the ashtray story,  $\chi^2(1) = 7.19$ ,  $p = .010$ , although overall a greater proportion of participants said creation occurred in the painting story (40%, 44 of 110 participants) than in the ashtray story (15%, 18 of 117 participants),  $\chi^2(1) = 17.30$ ,  $p < .001$ .

We next examined if ownership judgments were predicted by agent's intent and by participants' judgments of whether the agent created. Scores were entered into a 2(cover story: ashtray vs. painting)  $\times$  2(intent: agent intended to create vs. agent did not intend to create)  $\times$  2(creation judgment: participant judged item was created vs. participant judged item was modified) ANOVA. This analysis revealed a main effect of creation judgment,  $F(1, 219) = 56.43$ ,  $p < .001$ ,  $\eta^2_p = 0.21$ , but no main effect of intent,  $F(1, 219) = .333$ ,  $p = .564$ , or cover story,  $F(1, 219) = .002$ ,  $p = .966$  and no interactions, all  $p$ s  $> .410$ . The main effect of creation judgment showed that the agent was more likely to be identified as the owner by participants who affirmed that he created ( $M = 3.15$ ,  $SD = 1.79$ ) than by participant who thought he only modified an object ( $M = -0.82$ ,  $SD = 3.27$ ). Of participants who affirmed that the agent created, 94% (58 of 62) chose him as owner of the object; of participants who denied that the agent created, only 42% (69 of 165) chose him as its owner.

These findings again suggest that people view creation as establishing ownership, while also showing that they do not just base these

judgments on assessments of whether creation increases the value of materials. Even though the created objects were worth half as much as the original materials, participants who affirmed that creation occurred overwhelmingly chose the creator as owner. Also, in contrast with the previous experiments, participants' ownership judgments showed no influence of the agent's intent, though intent did affect their judgments of whether the agent actually created.

## 9. General discussion

Four experiments examined whether people judge that creation establishes ownership. Participants ascribed ownership to agents who successfully created, but were less likely to ascribe ownership to agents who modified objects but failed to create. Participants also showed sensitivity to creation even when labor and modifications to an object were held constant—participants who affirmed that an agent's actions resulted in creation were more likely to ascribe ownership than participants who denied that these same actions led to creation. Participants also showed sensitivity to creation when modifications to an object reduced its monetary value.

These findings suggest that people judge that creation leads to new ownership, and that creation affects ownership judgments over-and-above related factors that are distinct from creation, but which often co-occur with it—factors such as increased labor and physical contact with an object, first physical possession of it, and increases in the object's value. Regarding physical contact and first possession: In all scenarios, the agent never made direct physical contact with the created object, and someone else was always first to physically possess it. Nonetheless, participants were more likely to choose the agent as owner when he created than when he did not. Likewise, when participants judged that the agent created, they chose him as owner over the first possessor. These findings show two interesting things: First, they show that creation establishes ownership even without first possession, or direct physical contact. Hence, though people may adhere to a principle that first possession establishes ownership (Friedman, 2008; Shaw et al., 2012; Stake, 2004), and though other judgments about objects are often influenced by physical contact with it (Newman & Bloom, 2012, 2014), these factors do not suffice to explain why creators are viewed as owners. Second, the findings suggest that creation trumps first possession as a means of acquiring ownership, at least when creation precedes first possession (i.e., findings might differ if creation was subsequent to first possession).

Regarding value and labor: In Experiment 3, we asked participants to judge whether the agent's labor resulted in creation. Participants who judged that the agent created overwhelmingly ascribed ownership to the agent; participants who instead claimed that the same labor only modified the object, chose the agents as owner less often. These findings also occurred in Experiment 4, when it was specified that the agent's labor reduced the monetary value of the object. These findings suggest that creation plays a distinct role in establishing ownership, compared to other kinds of labor, and also that people's ownership judgments are sensitive to creation itself, and not just to assessments of whether labor increases an object's value. (Though, this is not to deny that assessments of value might also influence ownership judgments).

There are theory-based reasons to expect that creation contributes to ownership over-and-above the labor involved in creation. A common criticism of the labor theory of establishing ownership (Locke, 1690/1978) is that its scope is ambiguous (Nozick, 1974, p. 175; Rose, 1985). The theory does not specify how much labor is needed to acquire ownership. For example, it is unlikely that laboring on a tree by shaking its branches suffices to establish ownership of the whole tree (or even part of it). The view that creation establishes ownership avoids this problem, at least to some extent, because it does specify how much labor is needed for ownership—the labor needed to create a new object. This leaves open many other interesting questions, including questions about when labor suffices for creation to occur and what counts as a

new object. It also leaves open other questions of scope, such as the question of whether ownership applies only to the creation, or sometimes extends beyond it. For instance, if an agent creates a dwelling on non-owned land, people might judge that the agent's ownership extends beyond the dwelling, to also apply to the land on which it stands.

Our findings are also informative about the influence of intent on judgments of ownership established through creation. In Experiment 2, participants were more likely to ascribe ownership when the agent intended to create, compared to when the agent did not have this intention. However, a different picture emerged in the subsequent experiments, when we asked participants whether the agent had actually created: Participants who affirmed that the agent created, ownership judgments were not influenced by intent, and endorsed the agent as owner at high rates even when he created unintentionally. These findings contrast with previous findings showing that intent strongly influences ownership judgments when an agent labors to make an object available (Palamar et al., 2012), and reinforce the conclusion that creation is a distinct way of establishing new ownership, and different from laboring to make an object available. Nonetheless, intent likely had a less direct effect on judgments of ownership. Consistent with previous work (e.g., Gelman & Ebeling, 1998), it increased perceptions that the agent actually created, and participants who thought that the agent created were more likely to choose the agent as owner.

Although our experiments advance knowledge of people's causal judgments of how ownership is established, they also open some new questions. We close by considering two outstanding questions. First, our studies examined whether creation affects judgments of new ownership (i.e., instances where an object is originally non-owned, but might become owned). However, creation may also be relevant for judgments about ownership transfers. For instance, workers often use materials owned by a corporation to create new things. People might judge that these acts of creation transfer ownership (or some degree of ownership) from the corporation to the worker. Some existing findings suggest that adults deny that ownership is transferred when an agent creates a product out of someone else's materials (Hook, 1993; Kanngiesser et al., 2010; but see Kanngiesser & Hood, 2014). Nonetheless, people might have conflicting intuitions about such cases, though discovering this might require more sensitive measures (e.g., examining response times needed to decide who owns an object). A second remaining question concerns whether our findings extend to all types of created objects. In our vignettes, agents created physical objects that were relatively small and portable. However, many other kinds of creation are possible. For instance, although houses and paths are physical objects, they are not portable, and are rooted to the land. Likewise, people can create new ideas, but these are not physical. It is an open question whether creation establishes ownership for these kinds of creations, and whether creation contributes over-and-above related factors, like first possession.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jesp.2015.04.011>.

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