Who owns new creations? Initiation weighs more than completion

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Abstract

People contribute to new creations through different tasks, skill and effort. How do these contributions influence judgements of ownership? Past research has shown that initial effort towards a goal and net labour contribution are both relevant to intuitions about rightful ownership. However, their relative weights remain unclear, and hence often have different implications about who the owner should be. Here, we examine ownership judgements of new creations, contrasting different contributions. Across four online experiments (total N=704), we describe an initiator and a completer who work together on the creation of a new object, with their contributions varying in terms of effort, skill and how much they meet the original goal. We find an especially strong preference for the initiator to take ownership. This may be because initiation seems more necessary: without it, the subsequent steps of creation would not be needed.

Keywords: ownership; creation; initiation; labour; necessity; counterfactual reasoning

Introduction

Creating new objects, however big or impactful, takes central place in human social life. People's contributions to artefacts differ in many ways: in the nature of the task, the number of hours, the level of sophistication in skill. In one way or another, they are all necessary to complete the artefact. If sharing the final artefact is not feasible, how do people resolve dilemmas over who should own it? Past research documented a few psychological principles that guide people's ownership decisions: the labour rule, the idea vs. labour distinction, and the first pursuit vs. first possession distinction. According to the labour rule, whoever put more physical work into creation should own it (Burgmer, Forstmann & Stavrova, 2018; Kanngiesser, Gjersoe & Hood, 2010; Kanngiesser, Shoji & Hood, 2014), especially if it is intentional, goal-oriented labour (Levene, Starmans & Friedman, 2015). As a contrast, the idea vs. labour distinction implies that whoever had the idea for to create should own it, even if they don't provide any physical labour (Li, Shaw & Olson, 2013). The first pursuit vs. first possession distinction has emerged in the context of natural kinds, which suggests that when deciding between two competing claims to a natural resource, people consider who is more necessary for its possession, i.e. more likely to succeed at acquiring it (Friedman, 2010).

However, it is not known how these principles weigh against each other. This matters because they have different implications about who the owner should be, therefore our understanding of how people come to a stable resolution over the ownership of artefacts is not yet complete. The principles summarised above are alike in recognising that people contribute to an artefact in different ways, and these contributions may not be equally necessary for successful creation. This approach to the relative necessity of contributions reflects practices in many professional domains, often resulting in different financial compensation and professional prestige (Fisk, 2006; Herz et al., 2020). Take, for instance, the world of cinema. Film crews are typically large, with distinct tasks that are necessary for the existence of the film and are a mix of intellectual and physical labour. Yet the director, the writer and the cinematographer tend to be given more credit than the costume designer and the sound engineer. Perhaps the reason is of a counterfactual kind: without the director, there would be no film and therefore no need for the costume designer's contribution.

Here, we investigate if people consider the relative necessity of different contributions to a creation when they decide who should own it. Across four online experiments with adults, we describe an initiator and a completer who work together on creating a new object. We manipulate their contributions by varying their levels of material investment, effort, skill and how much their contributions help meet the initial goal. We test if these variations are perceived to change the course of events and the likelihood of a successfully completed project, and test if ownership judgements vary as a consequence. Our results point to a strong tendency for the initiator to take ownership, even in cases where the completer uses more materials and works longer. In the discussion, we suggest that people consider how much a contribution increases the likelihood of completion through counterfactual reasoning, and attribute ownership accordingly.

General Methods

We conducted four online experiments with adults (total N=704). Experiment 1A and 1B investigate if people detect 'whether' and 'how' counterfactuals (Gerstenberg et. al., 2015), and if they affect ownership judgements. They also a serve as a conceptual replication of Friedman

In D. Barner, N.R. Bramley, A. Ruggeri and C.M. Walker (Eds.), *Proceedings of the 47th Annual Conference of the Cognitive Science Society*

(2010), with creating artefacts rather than acquiring natural kinds. Experiment 2 investigates to what extent goal-oriented effort and skill are necessary for creation and ownership, and if ownership judgements change with a different outcome. Experiment 3 further investigates the links between effort, creation and ownership.

We used five scenarios with the same background story. All scenarios describe two siblings doing DIY projects. Sibling A starts working on an object. While Sibling A is away on holiday, Sibling B finishes the object. When Sibling A returns, they argue about who gets to keep it. The five scenarios specify that the two siblings keep their materials (wood, yarn, clay, strings, metal) separately, and describe different target objects (shelf, jumper, mug, guitar, knife). We aimed to equalise their material investment into the project with this specification.

We recruited fluent English speaker adults from Prolific to participate in a study hosted on Qualtrics for financial compensation. After giving informed consent, each participant was assigned to one of two conditions (in Experiments 1A, 1B and 2), or one of three conditions (in Experiments 3). Participants read one randomly selected scenario. After reading it, they were required to make a binary ownership judgement between Sibling A and B (presented in random order), estimate the likelihood of completion with one of their contributions by moving a 0-100 slider (preset to 50), and pass an attention check (choose the correct target object from three, presented in random order). All questions were presented on the same page. We excluded participants if they failed the attention check. Additional experiment-specific dependent variables are listed below. Data cleaning and statistical analyses were performed using Stata v18.5. The experiments had been evaluated and approved by the Psychological Research Ethics Board at Central European University prior to recruiting participants. Except where otherwise stated, all hypotheses and analyses were preregistered before data collection. Full materials and preregistration forms are available on OSF. The key manipulations in each experiment are summarised in Table 1.

Table 1: Summary of manipulations in all experiments in one of the scenarios. Bold added here for clarity.

Experiment	Manipulations
1A	Mike **doesn't have** / **almost certainly has** enough materials in his own stockpile to finish the shelf.
1B	While Mike is away, Laura paints the shelf in **the same colour, based on** / **in a different colour, modifying** the original design.
2	Laura decides to **finish the shelf** from her own stock of wood. / Laura decides to **turn the shelf into a coffee table**, using equal amounts of wood from her and Mike's stockpile.
3	Mike has built **10% / 50% / 90%** of the shelf.

Experiment 1A and 1B: 'Whether' and 'how' counterfactuals in attributing ownership of creations

Experiments 1A and 1B are a conceptual replication of Friedman (2010). Friedman (2010) distinguishes between a first pursuer and a first possessor, and tests which is more necessary for attributing ownership of natural kinds. This distinction has a counterfactual element by assuming that the first pursuer *would have* reached the natural kind first had the other person (the first possessor) not been around. We take this line of investigation further by differentiating between 'whether' and 'how' counterfactuals, as defined by Gerstenberg et. al. (2015). The 'whether' counterfactual, tested in Experiment 1A, evaluates if an action has led to the target outcome or not. The 'how' counterfactual, tested in Experiment 1B, evaluates how an outcome has ended up relative to what it could have been. In each experiment we test if ownership judgements are affected by these different counterfactuals.

Experiment 1A

Procedure and materials We manipulate if Sibling A has enough materials in their own stockpile to finish the target object alone in a 2x1 design. In both conditions, after Sibling A makes some progress and leaves, Sibling B completes the project using their own materials. By varying if A has sufficient materials on their own, we manipulated how necessary Sibling B's action seems for completing the outcome. See Table 1, line 1 for the key manipulation.

After reading the vignette, participants had to make an ownership judgement and move two sliders, one for the likelihood of completing the DIY project without Sibling B and one for the likelihood of completing the DIY project without Sibling A.

Results We recruited 150 participants (M_{age}=31, 59% female). We found little difference in ownership judgements in the two conditions. Figure 1 shows that Sibling A is favoured to be the owner of the object to a similar degree in both conditions (58/74 vs. 68/76; $\chi2(1)=3.43$, p=.064).

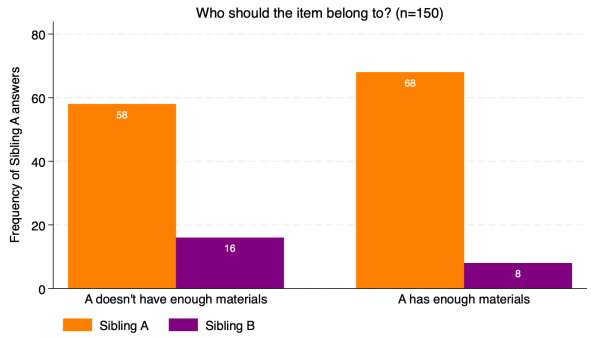

Figure 1: Ownership attribution in Exp1A, favouring A's ownership in both conditions. The two conditions differs if A had enough materials (Condition 2) or not (Condition 1), which varies how necessary B's action seems to the completion of the object.

Mean necessity scores for Sibling B, measured on the 0-100 likelihood of completion scale, differ significantly across the two conditions (M2=78.82, SD2=2.65, 95% CI [56.87, 69.74] vs. M1=63.3, SD1=3.23, 95% CI [73.54, 94.1]; $t(141.775) = -3.7136$, $p = .0003$, Cohen's $d = -.60722$) (see Figure 2 for their distribution). Put differently, participants thought it was more likely that the object would have been finished without Sibling B when Sibling A had enough materials (in condition 2) compared to when A did not have enough (in condition 1).

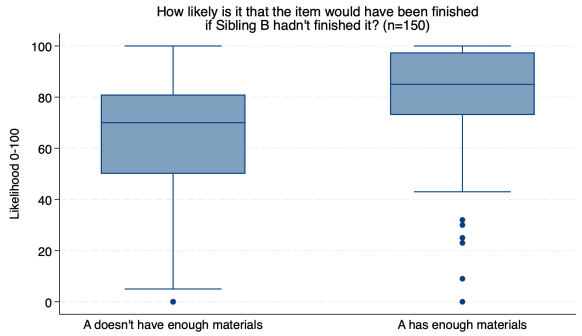

Figure 2: Distribution of necessity scores of B in Exp1A, measured as likelihood of completion. The higher the score, the lower Sibling B's necessity is to complete the project.

Experiment 1B

Procedure and materials In a 2x1 design, we vary if Sibling B's intervention continues on the same path that Sibling A had started (Condition 1) or not, resulting in a modified version of the target object (Condition 2). See Table 1, line 2 for the key manipulation.

After reading the vignette, participants had to make an ownership judgement, and rate how different the outcome would have been without Sibling B on a 5-point Likert scale.

Results We recruited 150 adult participants (M_{age}=37, 54% female). We found little difference in ownership judgements. As Figure 3 shows, Sibling A is favoured to be the owner to a similar degree in both conditions (65/71 vs. 68/76; $\chi2(1) = 0.0198$, $p = .888$). Similarity ratings, depicted on Figure 4, differ significantly per condition ($\chi2(4) = 48.98$, $p < .001$, Cramér's $V = 0.57$), but do not determine ownership judgements ($\chi2(4) = 0.98$, $p = .913$). In other words, participants were sensitive to how much Sibling B's contribution helped meet A's goal, but they did not attribute ownership on its basis.

Discussion of Experiment 1A and 1B In both experiments, we find preference for Sibling A's, i.e. the initiator's, ownership, even if they don't have enough materials to finish it alone (Experiment 1A), and if the outcome is a modified version of what they intended (Experiment 1B). This finding is in contrast to the labour rule, and is a partial replication of Friedman (2010) because the initiator's ownership is always favoured regardless of circumstances.

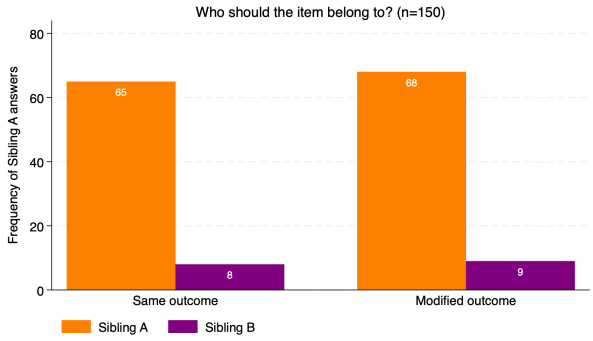

Figure 3: Ownership attribution in Exp1B, favouring A's ownership in both conditions. The two conditions differs if B continues working on the object in the way A had started (Condition 1) or modifies it (Condition 2).

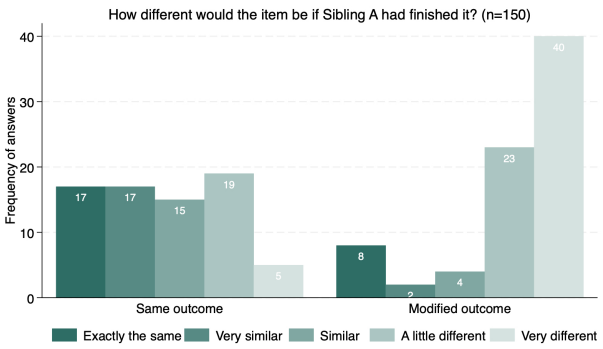

Figure 4: Similarity ratings as a manipulation check in Exp1B, showing the extent to which B's action has met A's goal in the two conditions.

Experiment 2

Experiment 1A and 1B provide evidence that people contrast how necessary contributions are for the outcome and make ownership judgements accordingly. However, it is plausible that higher levels of effort and skill increase the likelihood of successfully creating an artefact, leading to a different pattern of ownership judgements. We test this in Experiment 2.

Procedure and materials We use the same vignette templates as in Experiments 1A and 1B. We use a 2x1 design where Sibling B finishes the object that Sibling A has started, either meeting A's intended goal (Condition 1) or creating a completely different object (Condition 2). See Table 1, line 3 for the key manipulation. We adjusted the wording of the ownership question to reflect that the target objects differ in the two conditions. In addition to the ownership judgement and the likelihood of completion slider, participants are asked to choose who put more effort and is more skilled from 3 options (A, both, B), and rate outcome similarity on a 5-point Likert scale.

Results We recruited 188 participants (M_{age}=31, 65% female). Due to a coding error in scenario 4, we omitted 37 datapoints and excluded 5 more participants for failing the attention check, thus the final sample is 147 participants. Figure 5 shows that participants favour Sibling A's ownership to a greater degree in condition 1 than in condition 2 (63/75 vs. 49/72), but this difference is not significant ($\chi2(1) = 5.15$, $p = .023$). In other words, participants thought that A should always keep the object, even if it is not what A intended to build.

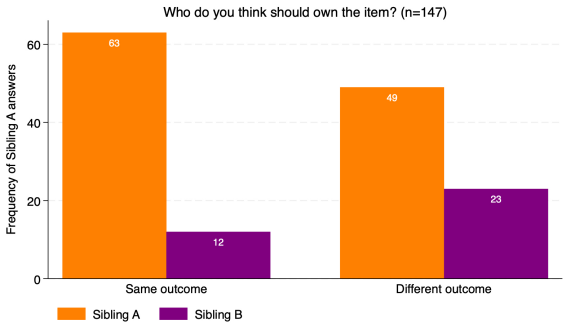

Figure 5: Ownership attribution in Exp2, favouring A's ownership in both conditions. The two conditions differ in whether B met A's goal (Condition 1), or built a completely new object (Condition 2).

In both conditions, participants thought that it was quite likely that the object that A had intended to build would have been finished without Sibling B's contribution (M1=63.87, SD1=3.18, 95% CI [57.52, 70.21] vs. M2=59.82, SD2=3.27, 95% CI [53.29, 66.35]; $t(144.652) = 0.8862$, $p = .377$).

In both conditions, "equal effort" (42/75 vs. 44/72) are "equally skilled" (66/75 vs. 59/72) were the modal responses. However, effort ratings differ significantly per ownership judgements ($\chi2(2) = 34.82$, $p < .001$, Cramér's $V = 0.49$). In other words, whoever is perceived to have put more effort is linked to whoever is favoured to own the object.

Outcome similarity ratings significantly differ across conditions, meaning that participants kept track of what the target object was and if the outcome ended up being the same as intended ($\chi2(4) = 60.67$, $p < .001$, Cramér's $V = 0.64$).

Discussion of Experiment 2 We find a similar pattern as before: the initiator's ownership is strongly favoured, even when the outcome is not the object A intended to make. Given perceptions that both are equally skilled at DIY, competence is unlikely to drive ownership judgements. Despite Sibling B's completion, use of own materials and meeting A's goal in Condition 1, participants thought that it was very likely that the object would have been finished anyway. Furthermore, ownership judgements and effort seem to be strongly linked. This may imply that without initiation, completion and other types of effort would not take place, making initiation more causally necessary. This finding also raises the possibility that initiation is considered to be a special type of effort, determining ownership.

Experiment 3

To further investigate the links between initiation, effort and ownership, we use a modified version of the same vignette templates. In a 3x1 design, we vary the completion levels of the object expressed in % when it changes hands (see Table 1, line 4).

In addition to the ownership judgements, participants were required to move 0-100 two sliders preset to 50, presented in random order: one for the likelihood of completion without Sibling B, and one for the likelihood of completion without Sibling A. We have slightly modified the exact wording of the question to make necessity more explicit (see materials on OSF).

Results We recruited 263 participants (M_{age}=33, 54% female), but excluded 6 participants who failed the attention check, reducing our sample to 257. Figure 6 shows that participants favour the ownership of Sibling A overall, but to different degrees across conditions ($\chi 2(2) = 22.96$, $p < .001$ Cramér's $V = 0.30$).

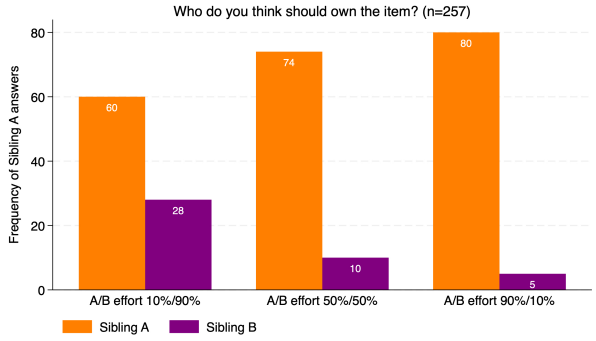

Figure 6: Ownership judgements in Exp3, favouring A's ownership in all three conditions, though to different degrees. The conditions differ in how much effort A and B put into the object expressed as %, with 10%/90% in Condition 1, 50%/50% in Condition 2 and 90%/10% in Condition 3.

The one-way ANOVA test of B's mean necessity scores reveals that the likelihood of completion without B is high in all three conditions (M1=74.60, SD1=30.62 vs. M2=79.58, SD2=26.06 vs. M3=87.77, SD3=24.35; $F(2, 237) = 4.54$, $p = .0117$). Conversely, Sibling A's mean scores across the three conditions suggest that the likelihood of completion without A is low (M1=40.18, SD1=35.94 vs. M2=29.58, SD2=31.25 vs. M3=20.73, SD3=29.89; $F(2, 254) = 7.77$, $p < .001$). Figure 7 shows the distribution of their necessity scores side by side in all three conditions.

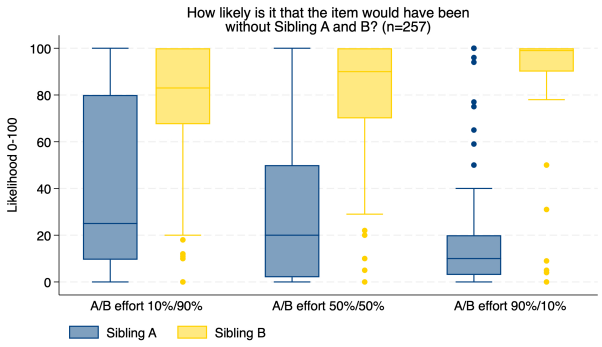

Figure 7: Distribution of necessity scores for both siblings in Exp3, measured as likelihood of completion. The conditions differ in how much effort A and B put into the object expressed as %, with 10%/90% in Condition 1, 50%/50% in Condition 2 and 90%/10% in Condition 3.

Discussion of Experiment 3 We find a similar pattern as before: Sibling A is consistently favoured to be the owner, even when they have done only 10% of the work. The strength of the 'initiator effect' is further shown by how low the likelihood of completion is without Sibling A, even when Sibling B has done as much work (50% in Condition 2) or considerably more (90% in Condition 1). Nevertheless, participants were sensitive to the difference in effort levels.

General Discussion

Across four experiments, we have found evidence that initiation weighs more heavily in ownership judgements than completion. Experiment 2 and 3 show that effort levels interact with initiation: perhaps initiation itself is perceived as a special type of effort. Unexpectedly, Sibling B's action is either not perceived as a welcome intervention, or if it is, it is not rewarded with ownership (see Experiments 1A and 3).

Overall, our results are in line with the "necessary for possession" account outlined in Friedman (2010). The same pattern of ownership judgements persists throughout the experiments, clearly pointing to initiation seeming more necessary for the creation of artefacts than completion. A simple account based on first possession only would predict, for example, that the completer should own the object in condition 2 of Experiment 2, because the completer built it, came in physical contact with it first and the initiator never intended to have that object. What we observe in the data instead is a reasoning based on who seems more necessary for creating the artefact, which seems to be initiation above anything else. This contrasts with the results in Friedman (2010), where there is variation in preferences for the first pursuer (initiator) and the first possessor (completer) to take ownership. The difference might lie in the subject of ownership judgements: while we focus on how ownership is judged about man-made artefacts, Friedman (2010)

investigates ownership of natural kinds. It is plausible that different factors are relevant to how ownership of these tokens is decided.

The results in Experiments 1A and 3 also support the idea that the most relevant factors to the ownership of artefacts are initiation and judging the necessity of contributions. The labour rule and similar accounts would predict that more physical work and material investment primarily determine who the owner is. Yet, we find a strong preference for the initiator to take ownership even when the completer provided more materials (Experiment 1A) and when the completer worked more (Experiment 3).

A critical question is what cognitive processes may trigger these intuitions. One candidate is counterfactual reasoning: without initiation, there would be no need for any kind of physical work, skill or material investment to complete an artefact. Because initiation seems highly ranked in importance, it is possible that participants reward the initiator by granting them rights of ownership, including exclusive usage and control of permission.

Another candidate explanation has to do with intentions and norm violation, not counterfactual reasoning and judgements of necessity. A plausible reading of participants' responses is that in their interpretation, the initiator intends to complete the DIY project, even though our wording leaves it ambiguous on purpose. In this sense, the completer doesn't get to keep the object because they violate a norm and essentially steal the initiator's partial creation. Future research could address this point, as well as take this line of investigation further to explain the value asymmetry of artefacts documented between creators and buyers (see e.g. Buccafusco & Sprigman, 2010), and to investigate how these lay intuitions might overlap with the legal principles behind copyright and intellectual property.

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