



# Ownership Dilemmas: The Case of Finders Versus Landowners

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Received 5 March 2016; received in revised form 22 November 2016; accepted 23 December 2016

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## Abstract

People sometimes disagree about who owns which objects, and these ownership dilemmas can lead to costly disputes. We investigate the cognitive mechanisms underlying people's judgments about finder versus landowner cases, in which a person finds an object on someone else's land. We test psychological hypotheses motivated directly by three major principles that govern these cases in the law. The results show that people are more likely to favor the finder when the object is in a public space compared to a private space. We find mixed support for the hypothesis that people are less likely to favor a finder who is employed by the landowner. Last, we find no support for the hypothesis that people are more likely to favor finders for objects located above ground compared to below ground. We discuss implications for psychological theories of ownership and potential applications to property law.

*Keywords:* Ownership dilemma; Finders; Property; Ownership; Psychology and law

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## 1. Introduction

In human societies, a person who finds something valuable such as an apple, gold mine, humpback whale, or oil reservoir is generally granted special access to it. But what happens when someone finds jewelry, cash, or an ancient boat on someone else's land? Some people think that if the landowner did not previously know about the object, then the finder is entitled to it, whereas other people think that the landowner owns every object on the land even if he or she did not know it was there (DeScioli & Karpoff, 2015). These mixed opinions mean that finders and landowners will sometimes disagree and dispute over discovered objects. Here, we investigate the cognitive mechanisms

underlying finder–landowner dilemmas by testing how the circumstances of a discovery affect whether people grant ownership to the finder or landowner.

Ownership is a fundamental concept in the human mind that shapes our everyday lives and how societies work. Despite its apparent simplicity, the notion of ownership has presented challenging mysteries for philosophers, social scientists, and biologists (e.g., Boyer, 2015; Brosnan, 2011; Buckle, 1991; DeScioli & Wilson, 2011; Friedman & Neary, 2008; Jackendoff, 1992; Stake, 2004). Ownership is an abstract concept and cannot be directly perceived in objects. Instead, people infer ownership using a complex set of inference rules that track an object's history and key events such as finding, creating, purchasing, and giving (Blake & Harris, 2009; Blumenthal, 2010; Friedman & Neary, 2008; Jackendoff, 1992; Kanngiesser, Gjersoe, & Hood, 2010; Kanngiesser & Hood, 2014; Kim & Kalish, 2009). These inferences typically occur naturally and without effort, and children reliably learn the concept of ownership and local ownership conventions without requiring deliberate instruction. These observations point to specialized cognitive mechanisms underlying ownership just as similar observations point to cognitive mechanisms underlying language acquisition (Chomsky, 1986; Pinker, 1994), mental state reasoning (Frith & Frith, 2003), and moral judgment (e.g., Darley & Shultz, 1990; De Freitas & Johnson, 2015; DeScioli & Kurzban, 2009, 2013; Haidt, 2012; Mikhail, 2007).

Moreover, people's willingness to respect an owner's control over an object seems arbitrary in an important sense: Merely being an owner is not predictive of an individual's ability to win a conflict over the resource. It is easy to understand why an individual would defer to someone who has more physical power or more social allies, because the stronger competitor would eventually win the resource anyway. It is less clear, however, why a stronger individual would forgo a resource merely because someone else found it, created it, purchased it, or otherwise met the conventional criteria for ownership. People's respect for ownership was so perplexing to some classic philosophers that they resorted to supernatural explanations for the human sense of property (reviewed in Buckle, 1991). Some other theorists such as Hobbes (1651) held that respect for property could only be maintained by a powerful coercive authority.

However, modern evolutionary biology and game theory arguably offer a better explanation. Theorists have shown that individuals who defer to the owner of a valuable resource can gain an evolutionary advantage (Kokko, Lopez-Sepulcre, & Morrell, 2006; Maynard Smith, 1982). In these models, individuals who respect seemingly arbitrary conventions, such as deferring to the individual who first possessed a resource, reduce their own costs of effort and injury from protracted battles. In evolutionary terms, the conditional strategy of fighting if one is the owner and fleeing if one is the intruder is an evolutionarily stable strategy against the alternatives of always fighting or always fleeing. In game theory terms, players can use an ownership convention to solve a coordination problem (Schelling, 1960), analogous to using a traffic light to avoid a costly collision.

Importantly, this coordination theory does not depend on authorities or institutions to enforce ownership—it shows how respect for property can emerge from simple two-player conflicts over resources. Moreover, the coordination theory is consistent with field and experimental observations that show deference to the first possessor in many different

animal species ranging from caterpillars to songbirds to chimpanzees (reviewed in Kokko et al., 2006)—animals that do not have formal institutions that enforce ownership. The coordination theory is also consistent with field and laboratory research in political science and experimental economics showing that people spontaneously create informal systems of property rights to manage resource disputes, even without enforcement by authorities (DeScioli & Wilson, 2011; Ellickson, 1991; Kimbrough, Smith, & Wilson, 2008; Ostrom, 1990). Critically, the argument is not that institutions do not influence how ownership works—they surely do—but that our basic sense of ownership is rooted in the individual's strategies for managing conflicts.

To actually perform an ownership strategy, an individual (of any animal species) needs cognitive mechanisms that can use cues to infer ownership and then condition aggression on ownership status. Moreover, humans are extreme in the sheer number of resources that can become sources of conflict, including land, shelter, a wide variety of food sources, and innumerable tools and artifacts. And human societies differ in the property conventions they apply to each resource, as illustrated by the massive tomes of property laws found in different cultures. Hence, it is likely, if not obvious, that the human sense of ownership has been highly elaborated and differentiated compared to other territorial animals. Human ownership cognition probably includes more complex sets of cues, an ability to learn local ownership conventions, and an ability to invent new ownership conventions for new resources (DeScioli & Karpoff, 2015).

Psychological research is beginning to uncover these abilities. But given the rich diversity of property conventions across cultures, there is likely much more to discover. We suggest that researchers can use property law as a catalog of common ownership disputes to help guide psychological research toward the key elements of our sense of ownership.

### *1.1. Ownership disputes and property law*

Most of the time, people in society agree about who owns which objects because they share many of the same cognitive inference rules about property. People generally infer that individuals own objects that they find, create, earn, purchase, inherit, or receive as gifts (Blake & Harris, 2009; Blumenthal, 2010; Friedman & Neary, 2008; Jackendoff, 1992; Kanngiesser & Hood, 2014; Kanngiesser et al., 2010; Kim & Kalish, 2009). However, when disagreements do arise, contenders might dispute ownership, and fighting can be very costly to both sides. Ownership dilemmas sour friendships, infuriate neighbors, divide communities, and provoke war among nations.

In modern societies, contenders often turn to courts of law to resolve property disputes. Legal professionals decide ownership using predefined principles that are established through common law precedents and statutory codes and maintained through formal training of practitioners. The courts repeatedly confront particular ownership dilemmas, and legal records catalog the most common and persistent ownership dilemmas in a society.

We leverage the literature from property law to help investigate the psychology of ownership and ownership dilemmas. First, we take our primary subject matter to be the ownership disputes that are documented in legal records. Accordingly, we use vignettes

based on historical property cases as stimuli in our experiments, asking participants who they think owns the object. However, unlike in real-world cases that come before the courts, we can experimentally vary one element of the circumstances at a time to test hypotheses about people's ownership judgments.

Second, we use principles from property law textbooks and court opinions to formulate hypotheses about the cognitive mechanisms that shape people's ownership judgments. We take the view that many property laws are not invented from scratch by authorities but instead they are built on basic human intuitions about ownership (DeScioli & Wilson, 2011; Ellickson, 1991; Ostrom, 1990; Stake, 2004). This idea contrasts with classic theories of property that attribute its origins to formal authorities (e.g., Hobbes, 1651). Instead, modern research shows that ownership judgments are shaped by distinctive psychological systems (DeScioli, Rosa, & Gutchess, 2015; Friedman, 2008; Friedman & Neary, 2008; Jackendoff, 1992; Kanngiesser et al., 2010) which are formed early in development (Friedman & Neary, 2008; Friedman, Neary, Defeyter, & Malcolm, 2011) and were favored by evolution for reducing the individual's costs of fighting (Boyer, 2015; Brosnan, 2011; DeScioli & Wilson, 2011; Kokko et al., 2006; Maynard Smith, 1982). If property law has deep psychological roots, then legal principles can help understand ownership psychology and vice versa (see also Blumenthal, 2010).

This general approach has proven useful in uncovering other psychological mechanisms. For example, Robinson and Darley (1995) used concepts from criminal law to uncover inference rules in moral psychology surrounding liability and blame. Darley and Pittman (2003) used the fundamental legal distinction between civil and criminal violations to reveal psychological mechanisms for retribution and compensation. Last, researchers have used moral dilemmas and principles developed by philosophers to reveal corresponding cognitive processes (Cushman, 2016; De Freitas, Myers, & Nobre, 2016; De Freitas, Tobia, Newman, & Knobe, 2016; Haidt, 2012; Knobe, 2005; Mikhail, 2007; Newman, De Freitas, & Knobe, 2015).

Importantly, we are not suggesting that lay people and legal professionals will always agree about ownership. Ownership disputes often involve conflicting principles. Legal codes might formalize some of people's property intuitions while suppressing rival interpretations, thus leading the law to diverge from public opinion in some cases. This idea is consistent with research in moral psychology, more broadly, which shows that early in development, children's sense of morality departs from their notion of legality (Kohlberg, 1981; Turiel, 1998).

These divergences can be consequential. Legal professionals might design rules specifically to oppose certain public sentiments in order to make society operate more efficiently (Posner, 1973). Formal rules can also displace more effective local systems of implicit rules, as has been observed in studies of irrigation systems, cattle ranches, and fisheries (Ellickson, 1991; Ostrom, 1990, 2005). Additionally, divergence can reduce the public's compliance with laws that do not fit their own judgments (Blumenthal, 2010; Darley, 2001). Despite this potential for disagreement, the underlying principles might still be the same, even if lay people and courts differ in how they prioritize the rules.

We apply this approach to study three key principles from property law using stimuli drawn from the same real-world cases that inspired the formation of these principles. For each legal principle, we propose a corresponding cognitive inference rule that shapes people's judgments about ownership.

### 1.2. *The psychology of property*

A recent and growing literature is beginning to uncover how people infer who owns what. Perhaps the most well-studied principle is first possession—the idea that the first person to possess an object is the owner. First possession is a key principle found in property law across many legal institutions (Dukeminier, Krier, Alexander, & Schill, 2006; Stake, 2004). Friedman (2008) began to study the psychology behind this principle by presenting participants with cartoons in which one character played with a toy before a second character played with it. Participants chose the first character when judging who owns the toy, but not when deciding who most likes the toy. Friedman and Neary (2008) observed the same results in young children; moreover, they found that 4-year-old children could also override the first-possession principle if the first possessor gave the object as a gift to the second possessor—in this case, children chose the receiver of the gift as the owner. Further, Blake and Harris (2009) found that 3-year-old children used first possession even for gifts, whereas 5-year-old children could override first possession for gifts, while also distinguishing gift-giving from theft.

Subsequently, Friedman (2010) argued that there is more to property judgments than first possession: Another key factor is who was necessary for possession. For example, in one experiment, participants read a story about a person who threw a rock to dislodge a gem from a cliff before someone else retrieved the gem from the ground below. Participants judged that the person who threw the rock was the rightful owner of the gem, rather than the person who possessed it first.

Additional research has examined a variety of other psychological underpinnings of ownership such as how people reason about transferring, stealing, destroying, controlling, and investing labor in property (Kanngiesser et al., 2010; Kanngiesser & Hood, 2014; Kim & Kalish, 2009; Neary, Friedman, and Burnstein, 2009; Olson & Shaw, 2011; Rossano, Rakoczy, & Tomasello, 2011). Another literature has examined how the psychology of property rights affects economic decisions (Hoffman, McCabe, Shachat, & Smith, 1994; Kahneman, Knetsch, & Thaler, 1991; Oxoby & Spraggon, 2008), including the emergence of property conventions in interactive economic games (DeScioli & Wilson, 2011; Kimbrough, 2011; Kimbrough, Smith, & Wilson, 2010; Kimbrough et al., 2008; Wilson, Jaworski, Schurter, & Smyth, 2012).

Despite this growing literature, few empirical studies have leveraged the rich catalog of ownership dilemmas found in property law. An important exception is Friedman (2010), who in one study asked participants about the classic property case of *Pierson v. Post*. In the original case, Post was hunting a fox when Pierson captured it; the courts ultimately ruled in favor of Pierson, the first possessor, arguing that pursuit was not sufficient for establishing ownership. In Friedman's study, participants also chose the first

possessor over the pursuer as the owner of the animal, showing judgments that mirror the legal principle of first possession.

More recently, DeScioli and Karpoff (2015) studied participants' judgments about 10 classic finders cases drawn from property law textbooks (e.g., Dukeminier et al., 2006). Participants read vignettes based on each case and decided whether the finder owned the object or whether it belonged to the person who owned the land where the object was found. Briefly, the results showed considerable variation; for some cases nearly everyone favored the finder, but in other cases hardly anyone did. Moreover, participants' judgments often departed from the law, as well as from previously studied principles, including first possession and being necessary for possession.

DeScioli and Karpoff's studies had a descriptive aim: They documented judgments about 10 different cases to uncover the broad patterns in need of explanation. By starting with description instead of testing hypotheses, they followed the prescription of Rozin (2001), Asch (1952), and philosophers of science who argue that description provides a critical foundation for subsequent theory development and hypothesis testing. Asch (1952) wrote, "Before we inquire into origins and functional relations, it is necessary to know the thing we are trying to explain" (p. 65). Moreover, Rozin (2001) argued that researchers in social psychology too often proceed directly to experiments and testing hypotheses without first establishing a basis in description. In contrast, more developed sciences such as biology and physics give greater weight to pure description. For instance, he showed that top biology journals frequently publish descriptive reports (decoding the genome, documenting new species, etc.) that do not test theories, whereas top social psychology journals rarely do so.

DeScioli and Karpoff followed this prescription by studying the most well-known property law cases from law textbooks to get a broad look at ownership judgments, rather than choosing cases for theoretical reasons that would have narrowed the investigation from the beginning. Each of the 10 studies had a single condition in which participants answered who they thought owned the disputed object. This approach was designed for relatively theory-free description rather than testing hypotheses, which of course typically uses random assignment to multiple conditions.

The present studies go beyond the descriptive foundation provided by DeScioli and Karpoff by using experimental designs to test theories about how people judge ownership for finder–landowner disputes. Instead of a broad range of cases, we purposefully selected two main cases that previously showed stark differences in ownership judgments, *South Staffordshire Water Co. v. Sharman* and *Bridges v. Hawkesworth* (DeScioli & Karpoff, 2015). We use carefully controlled  $1 \times 2$  or  $2 \times 2$  experimental designs with random assignment to condition to test causal theories about which factors account for the swing in judgments between these cases.

### 1.3. Three property principles

The present investigation focuses on the cases of, first, *South Staffordshire Water Co. v. Sharman* (Experiments 1–3) and, second, *Bridges v. Hawkesworth* (Experiment 4). South



Staffordshire Water Co. (henceforth abbreviated “Mr. Ford” and *Ford v. Sharman*) owned land that contained a pool and hired Mr. Sharman to clean the pool. While under Mr. Ford’s employment, Mr. Sharman found two gold rings at the bottom of the pool. Mr. Ford demanded the rings, but Mr. Sharman refused and gave them to the police instead, who tried to find the original owner. After failing to do so, the police returned the rings to Mr. Sharman, who decided to keep them. Mr. Ford then sued Mr. Sharman for the rings.

The judge in the case ruled that the landowner (Mr. Ford) owned the rings, because they were found at the bottom of the pool, and hence were similar to buried objects. Since a previous court case (*Elwes v. Brigg Gas Co.*, 1886) had ruled that items buried underground always belong to the owner of that land, the ruling of *Ford v. Sharman* followed this precedent. Consistent with the ruling, DeScioli and Karpoff (2015) found that participants also judged that the landowner owns the rings, with only 8% attributing ownership to the finder.

We compare these results to a similar case, *Bridges v. Hawkesworth*. A customer named Mr. Bridges visited the shop of Mr. Hawkesworth and found an envelope containing money on the floor of the shop. Mr. Bridges left the envelope with Mr. Hawkesworth in case the original owner returned. After years passed, and the original owner had not returned, Mr. Bridges asked to have the money back. Mr. Hawkesworth refused, and Mr. Bridges filed a lawsuit seeking return of the money.

The judge ruled that Mr. Bridges was entitled to the found property, stating that (reversing a previous ruling), “The finder of an article is entitled to it against all parties except the real owner, and we think that the rule must prevail, and that learned judge was mistaken in holding that the place in which they were found makes any legal difference.” DeScioli and Karpoff (2015) found that participants also judged that the finder in this case owns the money, with 75% attributing ownership to Mr. Bridges.

Why did both the courts and lay people favor landowners in one case and finders in the other? We consider three possible cognitive mechanisms that might explain these judgments. Each mechanism corresponds to a legal principle that is frequently referenced in court opinions for finder–landowner cases:

*Under-or-Attached Principle*—“The possession carries with it . . . everything which is attached to or under that land,” (Pollock & Wright, 1888).

*Public-Private Principle*—An object found in a private location belongs to the landowner (see the opinion for *South Staffordshire Water Co. v. Sharman*, 1896).

*Employment Principle*—When the landowner employs the finder, the landowner is entitled to the found object (*Danielson v. Roberts*, 1904; *South Staffordshire Water Co. v. Sharman*, 1896).

These three principles are widely referred to in many finder–landowner cases and are discussed in property law textbooks (Dukeminier et al., 2006). Any of these three

principles could potentially explain the difference between people's judgments favoring the landowner in *Ford v. Sharman* and favoring the finder in *Bridges v. Hawkesworth*. For *Ford v. Sharman*, the object was found under the mud, in a private backyard, and by a finder who was employed to clean the pool; in contrast, the object in *Bridges v. Hawkesworth* was found on the surface of the ground, in a shop accessible to the public, and by a customer rather than an employee of the landowner.

For our purposes, we use each principle to hypothesize a corresponding cognitive inference rule for making property judgments. Each principle specifies an inference rule that maps characteristics of the circumstances into an ownership judgment. Hence, each principle can motivate a testable psychological hypothesis about people's intuitive judgments for finder–landowner disputes.

These hypothesized principles are analogous to other types of psychological mechanisms such as rules for detecting objects in perception (e.g., De Freitas, Liverence, & Scholl, 2014; De Freitas, Myers, et al., 2016; Scholl, 2001), grammaticality in language (Chomsky, 1986; Pinker, 1994), or wrongness in moral judgments (e.g., Darley & Shultz, 1990; De Freitas & Johnson, 2015; DeScioli & Kurzban, 2009, 2013; Haidt, 2012; Mikhail, 2007). Consequently, psychological property rules can be empirically tested in analogous ways by manipulating the stimulus and measuring the resulting ownership judgments.

Similar to cognitive inferences about perception, language, or morality, people's intuitive property rules might or might not be accessible through introspection. That is, people might not themselves be aware of which factors shape their property judgments. In moral judgment, for instance, research shows that some intuitive principles are mostly unconscious, some are partially accessible, and some are accurately self-reported by participants (Cushman, Young, & Hauser, 2006). Moreover, participants' self-reported reasons for their moral judgments often reflect post hoc justifications, rather than the actual factors that shape their decisions (reviewed in Haidt, 2001). Consequently, research on intuitive judgments often uses between-subject experimental manipulations to test for intuitive principles rather than relying only on participants' self-reported reasoning. We apply these same experimental methods here.

By varying the circumstances of an ownership dilemma to isolate key variables, we can determine which principles explain people's judgments. For instance, if the under-or-attached principle influences judgments about *Ford v. Sharman*, then people will be more likely to favor the finder if the rings are found next to the pool versus buried in the mud. If the public–private principle influences judgments, then they will be more likely to favor the finder when he finds the rings in a more public versus private space. If the employment principle influences judgments, then people will be more likely to favor the finder if he finds the rings independently versus when he is employed.

## 2. Experiment 1

Experiment 1 investigates the under-or-attached principle by manipulating the location of the rings in *Ford v. Sharman* to be either above or below ground.



## 2.1. Methods

We recruited participants online using Amazon's Mechanical Turk. We chose a sample size that provides sufficient power to detect a medium effect size. We excluded five participants for incomplete responses or previous participation in similar studies, yielding a sample of  $n = 124$  participants ( $M_{\text{age}} = 36$ , 52% female).

Participants read a vignette based on the case, *South Staffordshire Water Co. v. Sharman*; we abbreviated the name of the plaintiff to "Mr. Ford." To focus participants' attention on their own property judgments rather than their knowledge of the law, they read: "Please make your decisions based on your own opinion and not on outside sources such as legal, economic, or political considerations." This instruction was designed to elicit participants' own intuitions rather than information from their prior knowledge or Internet sources<sup>1</sup>

In a between-subject design, participants were assigned to either the below-ground or above-ground condition. The below-ground vignette read as follows:

Mr. Ford hired Mr. Sharman to clean the pool in his backyard. While cleaning, Mr. Sharman found two gold rings in the mud at the bottom of the pool. Mr. Ford asked for the rings, but Mr. Sharman brought the rings to the police instead. The police were unable to find the owners, so they returned the rings to Mr. Sharman. Mr. Ford demanded to have the rings, but Mr. Sharman refused. Mr. Ford and Mr. Sharman continued to argue about who should keep the rings.

The above-ground vignette was the same except the rings were "on the ground next to the pool" instead of "in the mud at the bottom of the pool."

Participants answered the forced-choice question "In your opinion, who owns the rings?" by choosing between *Mr. Ford* and *Mr. Sharman*. Next, participants rated ownership on a 7-point scale by answering, "How strongly do you feel about who owns the rings?" (*very strongly Mr. Ford, strongly Mr. Ford, somewhat strongly Mr. Ford, neutral, somewhat strongly Mr. Sharman, strongly Mr. Sharman, very strongly Mr. Sharman*). Participants then explained their decisions, answered a comprehension question, and completed demographic items.

## 2.2. Results

Participants chose the finder as the owner 16% of the time in the below-ground condition and 18% of the time in the above-ground condition, showing no significant difference,  $\chi^2(1, N = 124) = 0.03$ ,  $p = .87$ ,  $\phi = 0.02$ . Participants chose the finder significantly less often than the landowner in both the below-ground ( $p < .001$ , binomial test compared to chance, 50%) and above-ground conditions ( $p < .001$ ).

For the ownership ratings, we coded responses favoring the landowner as negative and finder as positive, ranging from *very strongly Mr. Ford* = -3 to *very strongly Mr. Sharman* = 3 (*neutral* = 0). The mean ratings did not differ between the below-ground

condition ( $M = -0.48$ ,  $SD = 1.89$ ) and above-ground condition ( $M = -0.75$ ,  $SD = 1.73$ ),  $t(122) = 0.85$ ,  $p = .40$ ,  $d = 0.15$ . Compared to the neutral value of zero, ownership ratings favored the landowner in both the below-ground condition,  $t(66) = 2.07$ ,  $p = .042$ , and above-ground condition,  $t(56) = 3.28$ ,  $p = .002$ .

### 2.3. Discussion

The results do not support the under-or-attached principle as a factor that shapes ownership judgments. This principle does not appear to explain why people favor the landowner in *Ford v. Sharman*. Moving the rings to an above-ground location did not change participants' ownership judgments. Rather, participants favored the landowner in both the below-ground and above-ground conditions.

## 3. Experiment 2

We next examine the under-or-attached principle using a different case, *Elwes v. Brigg Gas Co.* It is possible that being underground had no effect for *Ford v. Sharman* due to the particular details of that case. Hence, we test a different case to see if being underground does not matter for other relevant cases beyond *Ford v. Sharman*. We select *Elwes v. Brigg Gas Co.* because the court opinion also applied the under-or-attached principle. For this case, DeScioli and Karpoff (2015) found that 19% of participants chose the finder as the owner of an ancient boat that they found buried in someone else's land. We test whether moving the boat to the surface of the ground makes people more likely to favor the finder.

### 3.1. Methods

We recruited participants using Amazon's Mechanical Turk and excluded one participant for missing information, yielding a sample of  $n = 119$  participants ( $M_{\text{age}} = 33$ , 52% female). We chose the sample size to provide sufficient power to detect a medium effect size. The procedures and measures were the same as in Experiment 1 except that the scenarios were different. Participants in the below-ground condition read a vignette based on the original case, *Elwes v. Brigg Gas Co.*, and it was identical to the version used in DeScioli and Karpoff (2015):

Mr. Elwes rented out a plot of land to Mr. Brigg. The lease allowed Mr. Brigg to build a large container to hold gasoline for Mr. Brigg's gas company. While building the gas container, Mr. Brigg found a prehistoric boat that was buried six feet underground. The boat was very valuable due to its historic significance, but no one previously knew that the ancient boat was there. When Mr. Elwes learned the boat was found, he demanded that Mr. Brigg turn it over. Mr. Brigg refused, and they continued to dispute who should keep the ancient boat.

In the above-ground condition, we replaced “buried six feet underground” with “hidden behind some trees.”

### 3.2. Results and discussion

Participants chose the finder as the owner 15% of the time in the below-ground condition and 14% of the time in the above-ground condition, showing no significant difference,  $\chi^2(1, N = 119) = 0.05, p = .82, \phi = 0.03$ . Participants chose the finder significantly less often than the landowner in both the below-ground ( $p < .001$ , binomial test compared to chance, 50%) and above-ground conditions ( $p < .001$ ).

For the ownership ratings, we coded responses favoring the finder as positive and landowner as negative, as in Experiment 1. The mean ratings did not differ between the below-ground condition ( $M = -0.72, SD = 1.44$ ) and above-ground condition ( $M = -0.73, SD = 1.72$ ),  $t(117) = 0.04, p = .97, d = 0.01$ . Compared to the neutral value of zero, ownership ratings favored the landowner in both the below-ground condition,  $t(59) = 3.87, p < .001$ , and above-ground condition,  $t(58) = 3.25, p = .002$ .

In sum, we found for another case, *Elwes v. Brigg Gas Co.*, that the placement of the object below or above ground did not affect participants’ ownership judgments. This observation contradicts the hypothesis that the under-or-attached principle is a psychological mechanism contributing to ownership judgments.

## 4. Experiment 3

Experiment 3 investigates the public–private and employment principles for judgments about *Ford v. Sharman*. To examine the public–private principle, we manipulate across conditions whether the object was found in a private or public space. By a private space, we refer to locations such as a person’s home or backyard, which are inaccessible to the public without special permission. By a public space, we refer to locations that are accessible to the public, such as a grocery store, health club, or shop—like the location of the envelope of money in *Bridges v. Hawkesworth* (see Introduction). This distinction follows the same distinction found in the court opinion for *Ford v. Sharman*. We further clarify that in the present context, public does not refer only to government-owned property like a public park but more broadly to any location accessible to the public even if it is legally owned by an individual, like Hawkesworth’s shop. Specifically, Experiment 3 varies whether the rings were found in Ford’s backyard or at a health club owned by Ford.

To examine the employment principle, we manipulate across conditions whether the finder of the object was employed by the landowner. We vary whether the finder was hired to clean the pool by the landowner or was independent, meaning he or she had no employment ties to the landowner.

#### 4.1. Methods

We recruited participants online using Amazon's Mechanical Turk. We chose a sample size that provides sufficient power to detect a medium effect size. We excluded 14 participants for missing the comprehension item, responding incompletely, or for having participated previously, yielding a final sample of  $n = 225$  participants. ( $M_{\text{age}} = 35$ , 56% female). Participants read a vignette based on *Ford v. Sharman* and were assigned to one of four conditions in a 2 (independent or hired)  $\times$  2 (public or private space) between-subject design.

The vignette in the private/hired condition was as follows:

Mr. Ford hired Mr. Sharman to clean the pool in his backyard. While cleaning, Mr. Sharman found two gold rings in the mud at the bottom of the pool. Mr. Ford asked for the rings, but Mr. Sharman brought the rings to the police instead. The police were unable to find the owners, so they returned the rings to Mr. Sharman. Mr. Ford demanded to have the rings, but Mr. Sharman refused. Mr. Ford and Mr. Sharman continued to argue about who should keep the rings.

The public/hired vignette was the same as the original except that "in his backyard" was replaced with "at the health club he owns." The private/independent vignette was the same as the original except that it began, "Mr. Sharman was throwing a baseball in the park when he accidentally threw the ball into Mr. Ford's pool. While retrieving the ball . . .," replacing the original first sentence and initial phrase of the second sentence. Finally, the public/independent vignette began, "Mr. Ford owns a health club with a swimming pool. While visiting the health club . . ."

Participants answered the same forced-choice question, ownership ratings, comprehension check, and demographic items as in Experiments 1–2.

#### 4.2. Results

Figure 1 displays the percentage of participants in each condition who chose the finder as the owner. We analyzed ownership choices using logistic regression with space, employment, and the interaction as factors. We found a significant main effect of space, Wald  $\chi^2(1, 225) = 33.85$ ,  $p < .001$ , a significant main effect of employment, Wald  $\chi^2(1, 225) = 10.96$ ,  $p = .001$ , and no significant interaction, Wald  $\chi^2(1, 225) = 1.17$ ,  $p = .28$ . Specifically, participants were more likely to favor the finder when the space was public rather than private, and when the finder was independent rather than hired.

Looking within each condition, participants significantly favored the landowner over the finder, compared to chance 50%, in the private/hired condition ( $p < .001$ , binomial test) and in the private/independent condition ( $p < .001$ ). No significant preference was observed in the public/hired condition ( $p = .24$ ), and participants favored the finder in the public/independent condition ( $p = .001$ ).

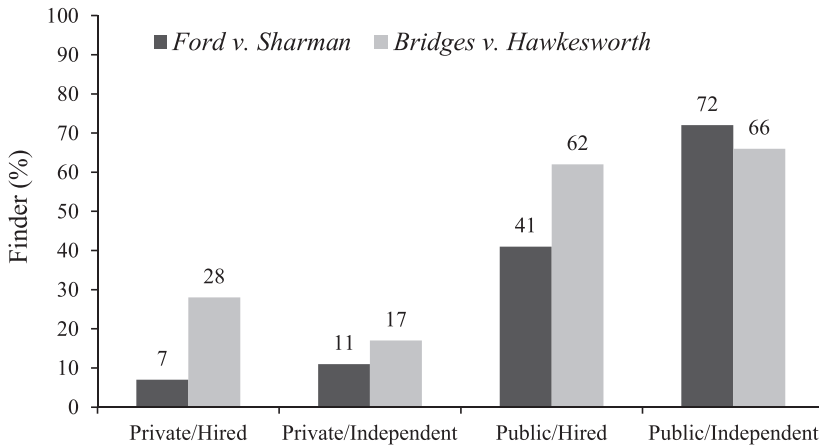


Fig. 1. Percentage of participants who attributed ownership to the finder in each condition of Experiment 3 (*Ford v. Sharman*) and Experiment 4 (*Bridges v. Hawkesworth*).

Table 1 displays the ownership ratings in each condition. We analyzed ownership ratings with a  $2 \times 2$  ANOVA with space, employment, and the interaction as independent variables. Participants showed greater support for the finder in a public space than in a private space,  $F(1, 221) = 32.43, p < .001, \eta_p^2 = 0.128$ . Participants also showed greater support for the finder who was independent compared to hired,  $F(1, 221) = 5.58, p = .019, \eta_p^2 = 0.025$ . There was no significant interaction between space and employment,  $F(1, 221) = 1.11, p = .29, \eta_p^2 = 0.005$ .

Compared to the neutral value of zero, participants' ownership ratings significantly favored the landowner in the private/hired condition,  $t(54) = 6.77, p < .001$ , and private/independent condition,  $t(53) = 4.24, p < .001$ . There was no significant difference from zero for the public/hired condition,  $t(57) = -0.68, p = .50$ , whereas participants significantly favored the finder in the public/independent condition,  $t(57) = 2.41, p = .019$ .

### 4.3. Discussion

We find evidence that people's ownership decisions are influenced by both the public-private principle and employment principle, supporting the hypothesis that these psychological mechanisms influence ownership decisions. Moreover, we find that both factors

Table 1  
Mean (SD) ownership ratings, Experiments 3 and 4

Case	Private		Public	
	Hired	Independent	Hired	Independent
<i>Ford v. Sharman</i>	-1.27 (1.39)	-0.96 (1.67)	-0.17 (1.94)	0.64 (2.02)
<i>Bridges v. Hawkesworth</i>	-0.70 (1.84)	-1.19 (1.68)	0.46 (2.04)	0.71 (1.81)

Note. Ownership ratings for Experiment 3 (*Ford v. Sharman*) and Experiment 4 (*Bridges v. Hawkesworth*). The rating scale ranged from -3 for the landowner to +3 for the finder as the owner.

need to be changed in order to switch the majority of participants from favoring the landowner in the original real-world case (private/hired scenario) to favoring the finder (public/independent scenario). This suggests that space and employment are sufficient to explain the difference in people's judgments between *Ford v. Sharman* and *Bridges v. Hawkesworth* observed in previous research (DeScioli & Karpoff, 2015). If so, then modifying the same dimensions for *Bridges v. Hawkesworth* should similarly determine whether people assign ownership to the finder (as in the original court case) or to the landowner.

## 5. Experiment 4

Experiment 4 manipulates the same variables as in Experiment 3, except using a different case, *Bridges v. Hawkesworth*. In the original *Bridges v. Hawkesworth* case, an envelope of cash was found in a public shop by someone who visited the shop independently. In previous research, participants presented with this scenario favored the finder as the owner of the envelope of cash (DeScioli & Karpoff, 2015). We test whether participants are less likely to favor the finder when the space is private and the finder is hired.

### 5.1. Methods

We recruited participants online using Amazon's Mechanical Turk. We chose a sample size that provides sufficient power to detect a medium effect size. We excluded 14 participants for missing the comprehension item, responding incompletely, or for having participated previously, yielding a final sample of  $n = 223$  participants ( $M_{\text{age}} = 32$ , 49% female). Participants read a vignette based on *Bridges v. Hawkesworth*, and were assigned to one of four conditions in a 2 (independent or hired)  $\times$  2 (public or private space) between-subject design.

The vignette in the public/independent condition was based on the original court case and read as follows:

A man named Mr. Bridges found an envelope full of money on the floor of a small shop owned by Mr. Hawkesworth. Mr. Hawkesworth did not previously know the envelope of money was there. Mr. Bridges asked Mr. Hawkesworth to hold onto the envelope and to return it to whoever lost it, if they came back. After a few years had passed, and it was clear that the original owner was not going to return, Mr. Bridges asked to have the envelope back. However, Mr. Hawkesworth refused and said he was going to keep the money. Mr. Bridges and Mr. Hawkesworth continued to dispute who should keep the envelope of money.

The private/independent vignette was the same as the original except the first sentence was replaced with "Mr. Bridges went to Mr. Hawkesworth's house to pick up a bicycle that he bought on the internet. Mr. Bridges found an envelope full of money on the floor in Mr. Hawkesworth's house."



The public/hired vignette replaced the first sentence of the original with “Mr. Hawkesworth owned a small shop and hired Mr. Bridges to clean it. While cleaning, Mr. Bridges found an envelope full of money on the floor.”

The private/hired vignette replaced the first sentence of the original with “Mr. Hawkesworth hired Mr. Bridges to clean his house. While cleaning, Mr. Bridges found an envelope full of money on the floor.”

Participants received one of the four vignettes and answered the same forced-choice question, ownership ratings, comprehension check, and demographics as in Experiments 1-3, except this time about Mr. Bridges and Mr. Hawkesworth.

## 5.2. Results

Figure 1 displays the percentage of participants in each condition who chose the finder as the owner. We analyzed ownership choices using logistic regression with space, relationship, and the interaction as factors. We found a significant main effect of space,  $\chi^2(1, 223) = 24.92$ ,  $p < .001$ , no significant main effect of employment,  $\chi^2(1, 223) = 0.22$ ,  $p = .64$ , and no significant interaction,  $\chi^2(1, 223) = 1.72$ ,  $p = .19$ . Specifically, participants were more likely to favor the finder when the space was public rather than private.

Looking within each condition, participants significantly favored the landowner over the finder, compared to chance 50%, in the private/hired condition ( $p = .001$ , binomial test) and in the private/independent condition ( $p < .001$ ). No significant difference from chance was observed in the public/hired condition ( $p = .11$ ), whereas participants favored the finder in the public/independent condition ( $p = .02$ ).

Table 1 displays the ownership ratings in each condition. We analyzed ownership ratings with a  $2 \times 2$  ANOVA with space, employment, and the interaction as independent variables. Participants showed greater support for the finder in a public space than in a private space,  $F(1, 219) = 38.48$ ,  $p < .001$ ,  $\eta_p^2 = 0.15$ . In contrast, participants' ratings did not differ between finders who were independent and hired,  $F(1, 219) = 0.21$ ,  $p = .65$ ,  $\eta_p^2 = 0.001$ . There was no significant interaction between space and employment,  $F(1, 219) = 2.28$ ,  $p = .13$ ,  $\eta_p^2 = 0.01$ .

Compared to the neutral value of zero, participants' ownership ratings significantly favored the landowner in the private/hired condition,  $t(53) = -2.81$ ,  $p = .01$ , and private/independent condition,  $t(57) = -5.39$ ,  $p < .001$ . There was no significant difference from zero for the public/hired condition,  $t(54) = 1.66$ ,  $p = .10$ , whereas participants significantly favored the finder in the public/independent condition,  $t(55) = 2.96$ ,  $p = .01$ .

## 5.3. Discussion

Participants were more likely to say that the finder owned the envelope of money if it was found in a public space rather than in a private space. The combined results of Experiments 3 and 4 provide converging evidence that the public-private principle is a psychological mechanism shaping people's ownership decisions. However, we did not observe a significant effect of employment in Experiment 4, unlike in Experiment 3.

These mixed findings for the employment principle might suggest that it is weaker or less consistent than the public–private principle. However, we note that while employment was not significant in Experiment 4, participants significantly favored the finder (> 50%) only when both the space was public and the finder was not employed by the landowner.

## 6. General discussion

The present experiments reveal the psychological inference rules behind people's judgments about finders and landowners. People's judgments about who owns a found object depend on whether the object is found in a private or public space, and to a lesser extent, on whether the landowner hired the finder (Experiments 3–4). Manipulating both space and employment was sufficient to change whether a majority of participants favored the finder or landowner in both *Ford v. Sharman* and *Bridges v. Hawkesworth*. We observed evidence for the public–private principle in both cases and mixed evidence for the employment principle, which showed a significant effect for *Ford v. Sharman* but not for *Bridges v. Hawkesworth*. In contrast, we found no evidence for the under-or-attached principle: Participants were not more likely to favor the finder for an object found on the surface of the land compared to underground (Experiments 1–2). This held true for two different cases, *Ford v. Sharman* and *Elwes v. Brigg Gas Co.*, in which the court opinions referred to the under-or-attached principle.

These experiments contribute to psychological theories of ownership dilemmas (Blumenthal, 2010; DeScioli & Karpoff, 2015; Friedman, 2010). DeScioli and Karpoff (2015) found that people's judgments about classic property law cases showed wide variation in whether they favored the finder or landowner, and this variation was not well explained by existing psychological theories. Here, we focused on *Ford v. Sharman* and *Bridges v. Hawkesworth* as exemplary cases in which participants favored the landowner or finder, respectively. The present results show that the public–private principle and, to some extent, the employment principle can account for the stark difference in judgments between these original cases, and more generally can explain much of the variation in judgments about finder–landowner disputes.

These findings support previous research concluding that ownership judgments are not based only on a simple rule such as first possession. Friedman (2010) found that participants frequently assigned ownership not to the first possessor but to the person who was more necessary for acquiring the object. The present experiments also show the limits of possession: The finder was always the first to discover, control, and possess the object; yet participants often chose the landowner rather than the finder as the owner. Similarly, DeScioli and Karpoff (2015) found that property judgments do not follow a simple finders-keepers rule. The present experiments go further by showing more specifically that finders' rights depend on the private or public nature of the location and the finder's employment.

The present findings are also not well explained by the necessary-for-possession rule proposed by Friedman (2010). In most of our scenarios, the finder and landowner did not

differ in who was more necessary for acquiring the object. A possible exception is that the finder might have been more necessary when the object was underground since the landowner might not have otherwise discovered it. However, whether an object was above or below ground had no effect on property judgments (Experiments 1 and 2), and more generally, participants did not consistently favor finders for hidden objects (Experiments 1–3). One potentially important difference is that the present cases involved objects that had prior owners (rings, money, and a boat), whereas the scenarios in Friedman (2010) involved previously unowned objects. Current theories do not predict differences based on whether the objects were previously owned, but this could be a productive area for future work.

The public–private effect also raises new questions about how people perceive locations as private or public. From a purely legal perspective, places like a grocery store or health club are privately owned by individuals. However, people seem to intuitively perceive these locations very differently from exclusive areas like a private home. Indeed, even the law attributes special privileges to one’s home: The Castle Doctrine allows a person to use lethal force against an intruder in the home even if the person could instead retreat, removing the duty to retreat that applies to other locations.

People’s intuitions about public and private locations are likely shaped by the territorial behaviors that humans share with many other animal species (DeScioli & Wilson, 2011; Maher & Lott, 2000; Stake, 2004). From this broader evolutionary perspective, territorial animals typically use cues to infer the owners and boundaries of territories, including occupancy, exclusivity, control, defense, and signals such as scent markings, visual displays, and specialized vocalizations (Maher & Lott, 2000). If humans use similar cues, then they might not fully believe, at an intuitive level, that a shopkeeper owns their store in the same way that a homeowner owns their house. For instance, the many visitors who freely come and go from the store could provide a strong cue that the shopkeeper does not fully own it, and if so, this would explain why people do not automatically grant the shopkeeper property rights over an object in the store.

The mismatch between people’s intuitions and certain legal definitions could have costly consequences. One possible example is a recent political dispute in Oregon over federal lands, which escalated to an armed standoff between protestors and law enforcement (Cawley, 2016). The heart of the dispute was that the protestors felt that the grazing lands belonged to local citizens, but the lands were officially owned by the federal government. In this case, intuitive cues of ownership such as usage and occupancy pointed to local ranchers as the owners but the lands were legally owned and regulated by outsiders, leading to resentment and conflict.

Finally, we suggest that legal professionals could apply insights from these experiments to help resolve finders cases. Specifically, legal professionals can consider formalizing the public–private principle and discontinuing the under-or-attached principle, either through new legislation or by overruling precedents in new cases. These changes might better cohere with people’s commonsense judgments and could be more effective as a result. One reason is that people are more likely to understand and comply with laws that resonate with their intuitions (Blumenthal, 2010; Coffee, 1991; Darley, 2001). A second

reason is that people's informal property judgments are in some cases more effective than formal laws at regulating conflict (Ellickson, 1991; Ostrom, 1990, 2005); hence, people's informal property rules merit careful study by legal scholars and professionals.

The concept of property is fundamental to the workings of human societies. People's inferences about ownership shape how resources are distributed and explain why these distributions differ across societies and over time. The psychological systems underlying ownership give rise to the formal and informal rules that people use to resolve ownership dilemmas (Ellickson, 1991; Ostrom, 1990, 2005). Future work can continue to use the present methods to investigate people's judgments about many types of property disputes, including intellectual property (Noles & Keil, 2011; Olson & Shaw, 2011), donations to charity (Weisbord & DeScioli, 2010), treatment of persons as property (Wilson & Daly, 1992), adverse possession (Dukeminier et al., 2006), eminent domain (Baude, 2013; Nadler & Diamond, 2008), and international territorial disputes (Huth, 1998). A better understanding of the psychology of property can help policymakers regulate disputes over resources, and it can provide insights into the sense of ownership we experience for our own possessions.

## Note

1. We note that this instruction could possibly cause some participants to bias judgments away from the law. However, this could apply only if participants knew the law, which would rarely occur. Even so, we tested this possibility by replicating the below-ground condition of Experiment 1 in a separate sample of  $n = 49$  participants using the same methods except without this sentence in the instructions. Participants' forced-choice and rating decisions did not differ from the original condition (all  $ps > .4$ ).

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