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1. Introduction

"The right to sell is one of the rights of property."
— Thomas Jefferson to Handsome Lake, 1802.

1.1. Property rights

Property rights determine what a person can and cannot do with respect to a delineated piece of property. The existence of property rights allows for welfare improving exchanges because buyers and sellers know who is getting what at the end. Because the existence of property rights is a necessary condition for exchange to occur, the degree to which property rights are defined and enforced is considered one of the main predictors of economic welfare (De Soto 2000). Well-defined property rights ensure that the likelihood of conflict is minimized, which decreases the cost of doing business (Demsetz 1967). Thus, the presence of a well-functioning system of property rights increases the likelihood that a welfare enhancing exchange occurs, which in turn contributes to the growth of an economy.

A distinction can be made between a legal and psychological approach to property rights. The legal approach focuses on the judicial system, which provides a normative view of how property rights should be defined and enforced. This approach aims to develop a legal framework to improve the law's ability to use property rights to the benefit of the public at large (Demsetz 1964). The psychological approach, however, focuses on how consumers tend to perceive property rights intuitively (Stake 2004). The aim of the psychological approach is to produce and develop theories

that reveal how consumers intuitively perceive property rights. This approach often requires the application of empirical methods to measure how consumers think and behave towards property rights. This thesis adopts the psychological approach.

In most cases consumers' perceptions of property right conform to codified law. The simplest scenario is that one person, say Bob, is the owner of a single well-defined physical good, a book. In this case there is little room for any misunderstanding. For example, to take away Bob's book without his consent is considered theft, which is illegal and psychologically considered immoral. It does not matter whether Bob still values the book; the mere fact that Bob cannot make use of the book anymore, to which he did not consent, constitutes a breach of his property rights and is almost universally perceived as such (Green and Kugler 2010). However, perceptions of property rights start to differ considerably from the legal interpretation of property rights once other types of goods are involved. Notoriously, perceptions of intellectual property rights differ often differ considerably from what the law prescribes (Nunes *et al.* 2004). Specifically, consumers are morally less concerned about violations of intellectual property rights compared to the legal measures that are put in place to protect intellectual property (Logsdon, Thompson and Reid 1994). This thesis focuses on nontrivial types of goods, such as intellectual property, to investigate how consumers tend to perceive property rights in general and how this might differ from a legal perspective.

1.2. A Basic Taxonomy of Goods

To determine what types of goods can be considered nontrivial, a taxonomy of goods is needed.

We adopt a basic taxonomy of goods based on two characteristics: (1) rivalry and (2) tangibility (Table 1.1). The first characteristic, rivalry, is a concept adopted from economics (Mankiw 2009). The degree of rivalry determines to what extent multiple consumers are able to enjoy the same good at the same time. Thus, only one person at a time can enjoy a perfectly rivalrous good. For example, a book is a perfectly rivalrous good because only one person at a time is able to read from it. In contrast, a large number of people can make use of a park, which is an example of a nonrivalrous good. In economics the distinction between rivalrous and nonrivalrous good is often used to determine whether a good can be considered a public good (Kroll, Cherry and Shogren 2007; Schlager and Ostrom 1992). Theoretically, an unlimited number of consumers can make use of the same good at the same time if it is perfectly nonrivalrous. Information goods are a prototypical example of a perfectly nonrivalrous good.

Table 1.1: ***A taxonomy of goods***

		Rivalry	
		Rivalrous	*Nonrivalrous*
Tangibility	*Tangible*	Books	Park
	Intangible	Reservation spots	Information

The second characteristic, tangibility, is a concept adopted from consumer psychology (Peck, Barger and Webb 2013). The degree of tangibility determines to what extent the good has a physical presence and, thus, can be touched. Peck *et al.* (2013) argue that tangibility increases perceived ownership because tangibility provides a sense of control over the object, even if tangibility is only imagined. In the literature there is an implied misunderstanding that intangible goods are necessarily nonrivalrous (Lysonski and Durvasula 2008). However, it is possible that an intangible good is rivalrous. A ubiquitous example is a reserved spot on a waiting list. Only a single person at the time can take a single spot on the list but the spot itself is not a tangible good.

The taxonomy provides a map of how the main chapters of this thesis relate to each other.

Chapter 2 provides a more detailed discussion about the complete taxonomy within the context of understanding how consumers tend to perceive theft and piracy. Chapter 3 concentrates on the distinction between rivalrous and nonrivalrous goods. Chapter 4 investigates how framing a rivalrous good as a nonrivalrous good can affect moral decision-making. Chapter 5 focuses on how consumers are inclined to exchange an intangible rivalrous good, a queue position, and to what extent consumers make a moral distinction between exchange mechanisms.

Even though information goods are nonrivalrous of nature, the number of consumers that are in fact able to consume the same good at the same time depends on the state of the art. For example,

initially, a song could only be heard by a small number of consumers if they were physically present at a venue. Afterward, a song could be stored on easy-to-distribute mediums, such as CDs, to allow a large number of consumers to enjoy the same song. These mediums constitute in essence a tangible and rivalrous representation of an otherwise intangible and nonrivalrous goods. As a result, the number of available mediums determined the potential reach. However, the Internet made it possible to transfer information goods easily without using any medium, which explicitly exposes the nonrivalrous nature of information goods. Numerous studies suggest that this development resulted in an increase of intellectual property right violations, also known as digital piracy (e.g., Bhattacharjee, Gopal and Sanders 2003).

Nunes *et al.* (2004) suggest an alternative taxonomy based on the cost structure of goods to understand consumers' perceptions of property rights. They argue that consumers are more likely to respect property rights of a good with high variable costs because consumers prefer to compensate seller for costs that can be directly attributed to a single unit (i.e., variable costs). Similarly, consumers are less willing to pay for goods with low variable costs even if the fixed costs are high, which is often the case for information goods. Nunes *et al.* (2004) argue that refusal to compensate variable costs is perceived as harming the seller because it causes a loss to the seller.

We posit, however, that the taxonomy based on rivalry and tangibility is theoretically more tractable. First, costs are historical and vary over time. Thus, the ratio of fixed and variable costs is not constant and not inherent to the good itself while rivalry and

tangibility are integral and stable properties. Second, consumers would only care about costs if they bought directly from the producer, which is often not the case. Nunes *et al.*'s (2004) framework implies that gifted goods are far more likely to be stolen considering the cost incurred by the current owner is zero. Rivalry and tangibility do not depend on the current owner of the good. Third, fixed and variable costs are often not known and can be inferred only partially through inspection. Rivalry and tangibility can be determined easily for any good. Furthermore, the degree of rivalry determines to what extent an owner can lose possession, which is closer to the concept of loss as understood in prospect theory compared to the notion of financial losses (Brenner *et al.* 2007).

1.3. The Psychology of Property Rights

A recurring theme throughout this thesis is the relevancy of prospect theory to gain a better understanding of consumers' perceptions of property rights (Kahneman and Tversky 1979). A central element of prospect theory is the notion that losses weigh more than gains to determine the attractiveness of options, also known as loss aversion. There is strong evidence that options that are framed in terms of losses are less attractive than options that are framed as gains, even if the outcome between the two types of options is exactly the same (Kühberger 1998). Loss aversion is extensively applied to explain a broad range of patterns in individual decision-making. More recent studies suggest that consumers also take into account to what extent others might experience loss aversion (e.g., Andersson *et al.* 2014).

Gintis (2007) argues that loss aversion reveals that humans are predisposed to recognize and respect property rights. Specifically, he points to the endowment effect as a strong indication that humans have an intuitive sense of property rights. The endowment effect is the empirically supported hypothesis that owned goods are valued more than non-owned goods. In a classic study Kahneman, Knetsch and Thaler (1990) show that the willingness to pay for obtaining a coffee mug is lower than the willingness to accept to sell the same coffee mug. This observation contradicts with standard economic theory, which predicts that there is no difference between willingness to pay and willingness to accept because the amount of value that can be derived does not change if ownership changes. In other words, the mere fact of being an owner of a good increases the perceived value of that good (Beggan 1992).

Three of the four studies reported in this thesis (Chapter 2, 3 and 4) focus on consumers' tendency to violate property rights of others. The aim of this approach is not to study violations of property rights *per se* but to determine under which circumstances consumers are more or less likely to violate property rights, which in turn uncovers how consumers tend to perceive property rights. Standard economic theory provides a baseline prediction of the likelihood of property rights violations (Becker 1968). This approach assumes a perfectly self-regarding consumer who would only respect property rights if the deterrence is sufficiently strong. Thus, such a consumer is assumed to trade-off, on the one hand, the value of violating property rights and, on the other hand, the probability of being caught and the magnitude of the punishment if

caught. This implies that in the absence of deterrence this consumer would not hesitate to violate property rights for self-gain.

1.4. Methodology

The studies reported in this thesis concentrate on corner cases in terms of property rights. The use of corner cases is an oft-applied technique in the study of morality because these cases force participants to reveal their moral preferences on nonobvious issues, which in turn furthers our understanding of human moral decision-making. Arguably the most influential corner case in the study of moral decision-making is the so-called trolley problem (Foot 1967). The trolley problem consists of the hypothetical scenario in which five persons are standing on a train track. A train is heading towards the five persons but it is possible to divert the train to a sidetrack by hitting a switch. However, on this sidetrack there is another person standing. The moral dilemma is whether it is morally justified to hit the switch, which prevents the death of five persons but does lead to the death of another person who otherwise would not have been killed.

Empirical studies show that a majority of respondents consider it morally permissible to pull the lever (Lanteri, Chelini, and Rizzello 2008). Although the scenario is extremely unlikely to ever occur in reality, numerous studies have compared reactions to variations of the trolley problem to uncover patterns of intuitive moral decision-making (Mikhail 2007). For example, a famous alternative scenario of the trolley problem is in which there is no sidetrack and instead it is possible to stop the train by pushing someone, who is assumed

to be overweight, from a bridge on the track. The impact of the train would kill this person but also stop the train, which prevents the death of the five persons. Even though there is no difference in outcome between the standard variation and the bridge variation, studies show that an overwhelming majority considers pushing a person from the bridge to save five lives morally impermissible (Lanteri *et al.* 2008).

This discrepancy reveals that moral decision-making is more than weighing the possible outcomes; it also matters under which conditions an outcome came about. Greene *et al.* (2009) theorize that the moral distinction arises from the fact that in the 'switch' scenario the intent is to redirect the train, which has the side effect of killing another person while in the 'bridge' scenario the intent is to use a person as a means to stop the train. Interestingly, this explanation is not intuitive considering that respondents seem unable to formulate a justification that matches the found pattern (Cushman *et al.* 2006). Similarly, this thesis emulates the above approach to identify deeper insights about how consumers tend to perceive property rights.

1.5. Thesis Overview

Chapter 2 focuses on the moral distinction between theft and piracy. Previous studies suggest that consumers are morally less concerned about piracy compared to theft (Nunes *et al.* 2004). The aim of this study is twofold. First, Chapter 2 explores whether a moral distinction between theft and piracy exists. Second, Chapter 2 aims to determine which factors adequately explain this

distinction. Chapter 2 consists of four vignette experiments. The goal of the first experiment is to establish to what extent a moral distinction between theft and piracy exists. The second experiment aims to establish whether consumers are more likely to pirate than to steal. The third and fourth experiment aim to disentangle to what extent rivalry and tangibility can explain the moral distinction between theft and piracy.

Chapter 2 is based on the paper titled 'Explaining the Moral Distinction between Theft and Piracy: Second-Person Loss Aversion' and the co-authors are Gert-Jan Munneke and Maurits van der Molen.[1] Gert-Jan Munneke and I designed the studies. Gert-Jan Munneke collected the data. I analyzed the data and wrote the paper. Maurits van der Molen provided supervision.

Chapter 3 further scrutinizes the moral distinction between theft and piracy based on the main findings of the studies reported in Chapter 2. One of the main conclusions of Chapter 2 is that rivalry determines to a great extent whether a violation of property rights is considered immoral. However, the studies in Chapter 2 consist of presenting hypothetical scenarios to the participant as an objective observer. Chapter 3 presents two economic experiments in which participants were provided the opportunity to steal or pirate. Thus, participants could actually monetarily gain from stealing or pirating and in those cases victims were actually monetarily disadvantaged. In the first experiment participants were only able to steal or pirate a single good. The second experiment extends to number of goods

[1] El Haji, A., Munneke, G.J. & Van der Molen, M.W. (2016). Explaining the Moral Distinction between Theft and Piracy: Second-Person Loss Aversion.

that can be stolen or pirated to ten and we manipulate the prices to vary the monetary incentive to steal or pirate. The experiments reported in Chapter 3 also introduce a novel method to compare theft and piracy without changing the payoff structure. As a result, the difference between theft and piracy is a matter of changing frames, which allows drawing conclusions about why consumers are more averse to theft than to piracy.

Chapter 3 is based on the paper titled 'The Moral Distinction between Theft and Piracy: An Experimental Study' and the co-author is prof. dr. Mark Leenders. Mark Leenders and I designed the studies. I conducted the experiments, analyzed the data and wrote the paper. Mark Leenders provided supervision.[2]

Chapter 4 investigates to what extent the aversion to theft is sensitive to changes in the nominal representation of goods. Previous studies, including Chapter 2 and 3, show that consumers are averse to stealing rivalrous goods (e.g., Oxoby and Spraggon 2008). However, it is unclear what precisely triggers this aversion. A distinction can be made between the nominal and real representation of a good. The distinction between the nominal and real representation is extensively studied in the context of money illusion. Money illusion is the psychological tendency to take into account the nominal value of money. For example, Shafir *et al.* (1997) show that consumers prefer receiving a 5% raise with 4% inflation to receiving a 2% raise without any inflation, while the latter option in real terms is more attractive. Thus, consumers tend

[2] El Haji, A. & Leenders, M.A.A.M. (2016). The Moral Distinction between Theft and Piracy: An Experimental Study.

to maximize the nominal amount even if this leads to a less attractive outcome in real terms. Chapter 4 explores to what extent the degree of theft can be mitigated or magnified by disentangling the nominal representation of goods from the representation in real terms. Particularly, we investigate to what extent the degree of theft increases if it is possible to steal without affecting the potential victim nominally, which is dubbed the dilution illusion. Furthermore, we explore whether susceptibility to the dilution illusion is associated with cognitive ability.

Chapter 4 is based on the paper titled 'Dilution Illusion' and the co-author is dr. Aljaž Ule. Aljaž Ule and I designed the experiment.[3] I conducted the experiment, analyzed the data and wrote the paper. Aljaž Ule provided supervision. Financial support from the University of Amsterdam Research Priority Area in Behavioral Economics is gratefully acknowledged.

Chapter 5 studies how the introduction of property rights in a queue can affect trading behavior and fairness perceptions. Queues arise if consumers are required to wait before being served and tend to become longer as demand exceeds supply even more (Kumar, Kalwani and Dada 1997). Queues can be prevented if the monetary price for the service is sufficiently high. However, in many cases prices cannot be changed or even introduced due to practical or ethical reasons. Consumers waiting in line are in essence paying with their time on top of the monetary price for the service (Kleinrock 1967). This leads to an inefficient allocation of services because the value of time is not the same for everyone.

[3] El Haji, A. & Ule, A. (2016). Dilution Illusion.

Theoretically, this inefficiency can be reduced if property rights are applied to the positions in queue (Gershkov and Schweinzer 2010). This would allow the queued consumers to trade positions, which would allow consumers with a high time value to pay for moving forward in the queue and consumers with a low time value receive money to move back in the queue. A position in the queue is an example of a rivalrous but intangible good.

The study in Chapter 5 investigates empirically how consumers respond to the ability to trade places in a queue. Specifically, two auction mechanisms are compared: (1) a server-initiated auction (SIA) and (2) a customer-initiated auction (CIA). The SIA mechanism requires every consumer to place a bid on a position, including the incumbent consumer, and the proceeds are distributed equally among the bidders. Thus, under the SIA mechanism, incumbents are not entitled to 'their' position in the queue and do not receive the full amount for selling `their` position. However, under the CIA mechanism property rights are exogenously enforced. Consumers can trade positions with the person in front of them. However, the person in front is not forced to sell and receives the full amount if sold. This experimental design makes it possible to study whether biases related to property ownership, such as the endowment effect (Kahneman *et al.* 1990) and the sunk cost effect (Arkes and Blumer 1985), are present and whether the exogenous enforcement of property rights affects bidding behavior.

Chapter 5 is based on the paper titled 'Trading Places: An Experimental Comparison of Reallocation Mechanisms for Priority

Queuing' and the co-author is dr. Sander Onderstal.[4] Sander Onderstal and I designed the experiment. I conducted the experiment and analyzed the data. Sander Onderstal and I wrote the paper. Sander Onderstal provided supervision. Financial support from the University of Amsterdam Research Priority Area in Behavioral Economics is gratefully acknowledged.

Chapter 6 provides an overview of the main findings of the studies reported in this thesis. Furthermore, we discuss how the studies combined contribute to the literature. Chapter 6 ends with an overview of the managerial implications of this thesis.

[4] El Haji, A. & Onderstal, A.M. (2016). Trading Places: An Experimental Comparison of Reallocation Mechanisms for Priority Queuing.