



Truck, barter and exchange versus the endowment effect: Virtual field experiments in an online game environment

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ABSTRACT

We examine the feasibility of using a massively multiplayer online role-playing game (MMORPG) to test economic theories. As a test vehicle we use the well-known endowment effect. Even though our goods are entirely virtual, our results confirm earlier results that individuals with more trading experience are less likely to exhibit status quo behaviour in trade. However, we also find evidence that highly experienced individuals are more likely to swap the item rather than keep it – i.e. there appears to be a propensity to ‘truck, barter and exchange’. A further experiment suggests that this feature is robust and is unlikely to be due to subject misperception or experimenter demand effects. However we are unable to eliminate selection effects as the source of our correlation between experience and propensity to trade. We conclude that virtual economies may be useful venues for field experiments.

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1. Introduction

Online role-playing games have become a significant venue for social interaction drawing millions of players daily to virtual worlds full of conflict, puzzles and trade. Multi-player games such as Runescape, Second Life, Farmtown or World of Warcraft have claims to be real economies (Castronova, 2002). In them, individuals labour to produce goods which are then exchanged with the products of other peoples’ time within well-developed trading institutions. As with real-world societies, experience acquired through the investment of time and energy changes productivity, while the freedom given to players to define their own strategies means that institutions and associations emerge and disappear spontaneously.

As well as being small-scale economies, virtual game environments have the potential to be venues for economics experiments, a point well-demonstrated by Chesney, Chuah, and Hoffmann’s (2009) use of Second Life.¹ In this paper we report on an experiment conducted within Runescape, a Java-based MMORPG (massively multiplayer online role-playing game). Our aim is threefold: first, to deepen understanding of behaviour in online economies. Second, in common with Chesney et al. (2009) or Castronova (2008), our aim is methodological: to explore the feasibility of using multiplayer gaming environments for (virtual) field tests of economic theories. An obvious point of contrast between our work and Chesney et al. (2009), or Fiedler and Haruvy

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¹ The same environment is used by Fiedler and Haruvy (2009) for their trust game experiments

(2009), is that their set-up is designed to mimic a laboratory environment. In that regard our intervention more closely resembles a field experiment, albeit one where subjects still know that they are taking part in an experiment. Our third and final goal is to extend the domain of experimental research on the ‘endowment effect’. This phenomenon is said to occur when the minimum compensation which individuals are willing to accept (WTA) in return for giving up a good is greater than the amount which they would be willing to pay (WTP) to acquire it in the first place (Kahneman, Knetsch, & Thaler, 1991). It has been recorded by researchers many times in laboratory experiments (Bateman, Munro, Rhodes, Starmer, & Sugden, 1997; Kahneman et al., 1991; Shogren, Seung, Dermot, and James, 1994) and investigated in a number of field settings (e.g. List, 2004). In one typical format for the experiment, subjects are randomly endowed with one of two goods, say A and B. At a later stage in the experiment, they are invited to exchange the endowment for the other product. According to standard consumer theory, preferences are independent of endowment. As a result the proportion of the subjects who prefer A to B should be equal in the two sub-samples. If choice reveals preference, then this means that the proportion that chooses A over B should be equal across the sub-samples or equivalently that the sum of the proportions of subjects who accept the invitation to swap should equal 1. In practice in many experiments (e.g. Kahneman et al., 1991; Knetsch, 1989), the sum falls well short of one, indicating that a significant proportion of subjects show a reluctance to give up the endowment.² In his widely-cited field experiments, List (2003, 2004) extends the results by leaving the laboratory and using subjects from US memorabilia markets. In these markets collectors and traders exchange collectibles such as sports cards and limited edition pins (badges).³ As in the laboratory, each subject is randomly endowed with one good of two goods and later offered a chance to exchange it for the other item. List finds endowment effects for amateurs who trade less intensively, but no effects for professional traders and high intensity amateur traders. If they are widely true, then these results have strong implications for the general applicability of laboratory experiments on the endowment effect. Thus there is value in seeing whether List’s influential results are replicable in other arenas or whether they are confined to the particular US memorabilia markets he studies. One particular feature of role playing games (RPGs) is that, like the sports card and pin markets, virtual markets have variation between experienced and inexperienced individuals. Furthermore, the level of experience in the virtual market is typically reflected in player scores that make it easier to categorise experienced and inexperienced market players. Runescape in particular has many opportunities for trading, so it seems like a natural venue for a field test.

In terms of methodology, we find it relatively easy to conduct an experiment in an online environment, though the level of control over subject behaviour is closer to that typically observed in a field experiment or a street-based survey rather than a laboratory experiment. For instance, though nearly every subject invited to take part agreed and completed the experiment successfully, three potential subjects ‘ran away’ with the endowed good, a problem not typically faced in the laboratory.

The major results are as follows: first, we find evidence of a large endowment effect for inexperienced players. In other words, online players act like subjects in many other experiments on the subject. Second, in keeping with other field studies we find that the higher the level of experience the lower the endowment effect. Our third main result is that highly experienced players over-trade, in the sense the average person is more likely to swap their endowment for the alternative than to stick to the status quo. This is where our quote from Adam Smith originates: for experienced players a propensity to truck barter and exchange⁴ appears to dominate any endowment effect.

The remainder of this paper is as follows: Section 2 provides background material on our virtual laboratory and describes the experimental design and results of our first experiment; Section 3 presents the design and analyses the empirical evidence from a second, follow-up experiment and Section 4 concludes with some discussion of methodological issues and some speculation on the implications of our results for the interpretation of field experiments on the endowment effect.

2. Experiment one

2.1. Design

We begin with some brief but necessary background about the possibly unfamiliar environment of the experiment, Runescape which has around one million paid-to-play accounts (P2P) and nine million free-to-play accounts (F2P).⁵ The game takes place in the fantasy realm of Runescape which is divided into 18 different kingdoms or regions. Players are shown on the screen as playable avatars (i.e. online characters). Compared to some other MMORPGs, the game gives extensive freedom to players in term of setting their own objectives, and deciding which of the available skills and activities to pursue. There is no linear path that must be followed in Runescape: players can engage in fights with or against others or with monsters. They

² The original experimenters, surveyed in Kahneman et al. (1991), devote some efforts towards removing misunderstanding, perceptions of scarcity, transactions costs or other frictions as explanations of the inertia.

³ For instance, a sports card might be a small card showing a famous baseball player along with some key statistics from his career. A pin or badge might depict a Disney character such as Mickey Mouse. What makes the item collectible varies, but it typically involves some element of scarcity.

⁴ “This division of labour, from which so many advantages are derived, is not originally the effect of any human wisdom, which foresees and intends that general opulence to which it gives occasion. It is the necessary, though very slow and gradual consequence of a certain propensity in human nature which has in view no such extensive utility; the propensity to truck, barter, and exchange one thing for another.” (Smith, 1776, Book 1, chap. 2).

⁵ From www.jagex.com.

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