

## Disentangling the sense of ownership from the sense of fairness

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**Abstract:** Both evolutionary and developmental research indicate that humans are adapted to respecting property rights, independently (and possibly orthogonally) to considerations of fairness. We offer evidence from psychological experiments suggesting that enforcing one's rights and respecting others' possessions is a basic cognitive mechanism, automatically activated and grounded in humans' sensory-motor system. This may entail an independent motivation that is more profound than considerations of fairness and impartiality.

Baumard, André and Sperber hypothesize that cooperative moves in the form of transfer of money to other participants is often not a form of altruistic giving but rather an attempt to refrain from stealing the money over which the others have legitimate claims. Though we share with Baumard, André and Sperber the claim that people take into accounts property rights when distributing monetary resources, it is not clear whether this is in fact evidence that subjects aim at a fair distribution motivated by a partner-selection based morality.

Actually, respecting property rights may be an adaptation independent from, and possibly orthogonal to, mutualistic morality. Indeed, evolutionary and developmental work suggests that humans (as many other animals) are equipped with a basic sense of ownership that exploits a number of cues to establish property rights over things. Sensitivity to these cues is an evolved adaptation for mutual advantage which, however, does not need social selection to be explained (Maynard-Smith & Parker 1976). As far as low value items are concerned, ownership rights established by cues of first possession and over the product of one's own labor can be explained in this way. In contrast, rights over high value resources that can be secured only through collaboration require the cultural evolution of some form of sharing norms to be sustained (Gintis 2007). Developmental evidence supports this view too. Several studies show that infants have a sense of ownership since their birth (Rochat 2011) and become sensitive at property rights of others already at 3 years (Friedman & Neary 2008; Kanngiesser et al 2010; Rossano et al 2011). However, it is mainly due to the role of active teaching (especially by their parents) that they learn to share with others from there on (Ross 1996; Rochat et al 2009). The ability to modulate one's possessive behaviors is thus particularly important to favor the kind of social harmony required in collaborative activities.

At the level of cognitive mechanisms, different studies indicate that humans have a rather precocious sense of object's possession. Psychological experiments (e.g., Chen & Bargh, 1999; Freina et al., 2009) reveal that when presented with positive words participants tend to perform an approach movement, in order to attract the objects they refer to; the opposite is true for negative words. This advantage of the self for positive objects persists even when participant are asked both to take an object for themselves and to give a different one to others (Gianelli et al, 2011). This can obviously lead to competitive situations with respect to object's possession (Gianelli, Scorolli & Borghi, in press). These studies suggest that humans have developed this basic tendency to keep positive objects for themselves. Beyond this very basic tendency to keep positive objects for ourselves, a number of results suggest that an early sense of ownership develops

as well. Recent experiments we performed (Scorolli, Borghi & Tummolini, in preparation) showed that the sense of ownership is a basic mechanism, which is activated quite fast and automatically, since it emerges even in tasks in which no reference to the sense of ownership is made. We used the same context to evaluate the relative weight of different cues in determining the sense of ownership: *physical proximity*, *discovery* and *physical contact* with the same originally neutral objects. In different experiments participants were shown a virtual room with an object located on a table. In one condition two actors were alone in the scene, in another condition an external observer was present as well. The external observer was introduced in order to verify whether the sense of ownership would be modulated by the presence of a third impartial person. Immediately after the virtual scene, participants were presented with a sentence, referring to the ownership of the object (e.g. “The girl owns the book”; “The book belongs to the girl”). Their task consisted in evaluating if the sentences were sensible or not. In different series of experiments analysis of response times provided evidence of the development of a basic sense of ownership based on object closeness in space to the protagonist (the object could be located near to the protagonist or not), on discovery (the participant would see the protagonist discovering the object), and on contact (participants would see the protagonist touching an object). Finally, Constable et al. (2011) demonstrated that the automatic tendency to respond to objects’ affordances is inhibited once we know that it belongs to someone else. In a stimulus-response compatibility task (see Tucker & Ellis 1998), the classical compatibility effect was abolished when participants had to respond to an object owned by the experimenter. This suggests that the action system is automatically inhibited and blind to the potential for action toward another person’s possession. Taken together these studies provide initial evidence that a fast, possibly automatic, embodied mechanism is at the basis of the development of the early sense of ownership.

It would be really difficult to explain these results starting from the idea that the respect of property rights is motivated mainly by a biologically evolved sense of fairness. However, it is possible that the existence of a basic sense of ownership as that for which we provide evidence complements the influence of a socially developed sense of fairness. We propose that these two different mechanisms, the basic sense of ownership and the evolved sense of fairness, differ along various dimensions: in cognitive control, i.e. the first mechanism is automatic while the second is controlled; in time course, i.e. the first is rather precocious while the second occurs later; in penetrability, i.e. the second can be more easily modulated by social and cultural context. So far our studies suggest that an early activation of the sense of ownership is based on different factors and is partly grounded in our sensorimotor experience. It is plausible that the tendency to keep all good things for ourselves and the acknowledgment of property rights co-occur, and that the competition between these two contrasting basic tendencies is won differently depending on the context. In the same vein, Neary (2011) has suggested that children learn the appropriate contexts where to override possessive inclinations in favor of sharing with others. Thus this ability of sharing could develop later, in contrast with the more primitive need to rigid possessive behaviors. Further experiments and studies are needed to investigate the interplay between the primitive tendency to keep good things for ourselves, the early sense of ownership and the probably later socially developed sense of fairness.

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