broader notions of symbolization than those represented in the sociological literature might not be as easily subsumed under the Drug Theory – for example, notions of symbolic utility associated with Robert Nozick. Nozick defines a situation involving symbolic utility as one in which an action (or one of its outcomes) "symbolizes a certain situation, and the utility of this symbolized situation is imputed back, through the symbolic connection, to the action itself" (Nozick 1993, p. 27). Money use in highly affluent societies can often have this property. Nozick notes that we are apt to view a concern for symbolic utility as irrational when the lack of a causal link between the symbolic action and the actual outcome has become manifestly obvious, yet the symbolic action continues to be performed. Many dysfunctional interactions surrounding money seem to have this property of being detached from real-world outcomes and becoming attached to very abstract memeplexes (political memeplexes that seem to serve neither personal interests nor genetic interests come to mind). L&W recognize the difficulty here when they acknowledge "that money is essentially a symbol, perhaps multiply symbolic (cf. Lea et al. 1987, Ch. 12), seems hard to reconcile with any kind of biological analysis of money motivation; it leads, furthermore, to a cognitive rather than a motivational analysis of behaviour towards money." This seems right, and the cognitive substrate that it relies upon would seem to be in the domains of simulation and metarepresentation (Carruthers 2002; Currie & Ravenscroft 2002; Dienes & Perner 1999; Nichols & Stich 2003; Sperber 2000) – precisely the domains upon which memetic evolution is dependent.

If the *origins* of money are in the mechanisms outlined in the Drug Theory, then I would argue that a further exaptation has taken place in the service of memetic evolution. An exaptation for memetic purposes would likewise be consistent with the many findings of biological nonfunctionality that L&W find supportive of the Drug Theory, and it would additionally be consistent with many findings in the heuristics and biases literature which show that interactions involving money are instrumentally irrational (Kahneman & Tversky 2000; Raghubir & Srivastava 2002; Shafir et al. 1997; Stanovich 1999), that they do not serve the interests of the individual (whether or not they are consistent with genetic fitness maximization; see Stanovich 2004).

In L&W's Drug Theory, money parasitizes trading that is derived from reciprocal altruism. However, L&W might just as easily (and additionally) have posited money parasitizing trading derived from strong reciprocity (Fehr & Fischbacher 2003) – altruistic acts performed when no reciprocal benefit is possible. This uniquely human form of behavior is increasingly viewed as the product of gene/culture evolution (Fehr & Fischbacher 2003; Gintis 2003; Gintis et al. 2003; Richerson & Boyd 2005). This, in part, puts the Drug Theory on a memetic foundation as well as a biological one.

Money motives, moral philosophy, and biological explanations

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Abstract: Lea & Webley (L&W) provide two alternative biological accounts of human monetary motivations, the Tool Theory and the Drug Theory. They argue that both are required for an adequate explanation. I explore the applicability of these models to philosophical discussions of how we might justify such motivations. I argue their approach is not entirely satisfactory for normative questions, since it precludes the possibility of rational non-instrumental attitudes towards money.

Lea & Webley's (L&W's) target article explores the important question of what the biological basis of our monetary motives might be. One obvious explanation involves their Tool Theory, according to which money is a tool and our reasons for desiring it are to be understood like our desire for any tool in terms of what other goods it is able to help us obtain (sect. 2.1). L&W argue that while this has some intuitive appeal, a Tool Theory of money motivation fails to explain fully the strong pull of money as a motivator. A full explanation requires that we understand money as acting sometimes, in a metaphorical sense, as a drug. According to their Drug Theory, money intrudes metaphorically on the normal functioning of the nervous system: money acquires its incentive power because it mimics the psychological action of some other more natural incentive (sect. 2.2.4). Accordingly, it involves irrationality.

My interest here concerns money motives and morality. What applicability might this have to normative theories regarding the extent to which we should be motivated by money in the way that we so obviously are. For the moral philosopher, any interest here would be in *justification* rather than *explanation*. How well might L&W's template fit onto the history of what R. H. Tawney (1926) called "economic casuistry"? Unlike more radical approaches that would cast all monetary motives as immoral, the economic casuist distinguishes between legitimate and illegitimate monetary motives.

We can discern two central schools of thought regarding money motives in this more moderate tradition. The first of these derives from the work of Immanuel Kant, and sees money as a tool or instrument which is only to be used for buying "tool-like" things. For Kant, money is a pure means. He contrasts this with *persons* who are ends-in-themselves and should be accorded respect in keeping with their status as persons. Kant argues that every thing has either a price or a dignity and if it has a price it cannot have a dignity (Kant 1785/1946). Although it is quite legitimate to regard mere *things* as means and therefore to ascribe to them a price, this is not the case with persons. Clearly, what we have here is a Tool Theory of normative evaluation. Money is a tool and it is wrong to treat persons as if *they* were tools.

The second great tradition is Aristotelian in origin and focuses on the role that money plays in the best possible life. Aristotle, and later philosophers such as Aquinas, regarded money as the very embodiment of an instrument and, as such, it could not be a proper end of activity (Aristotle 1952). However, immersion in commercial life often leads people to regard money as an end-in-itself. For the Aristotelian this is an irrational mistake. In explaining this irrationality, Aristotelians focus on the inability of money to function as an ultimate goal. Proper activities have a realizable goal. When one aims to build a boat, one realizes one's goal when the boat is completed and ready to sail. But in the case of money there is no point at which one realizes one's goal of making money. Having no satisfaction conditions, it endlessly iterates (Walsh 2004). Obviously, this second tradition can be cast as a Drug Theory. According to the Aristotelian tradition, the person who takes the pursuit of money as their fundamental goal is irrational since the very nature of money is such that it cannot function in this way.

It appears, then, that L&W's template fits neatly onto the two main ethical traditions in Western philosophy that seek to distinguish between legitimate or illegitimate money motives. These accounts of the moral difference conform either to the Drug model or to the Tool model, since the normatively undesirable motives here are either understood as cases of "inappropriate tool-treatment" or of irrational drug-like behavior. Built into such a model is the assumption that non-instrumental motives towards money must be irrational. We can see this assumption at work in L&W's discussion of restrictions on money use (sect. 4.5). Money is said to function as a drug in those cases where it is "found to have a value and an emotional charge that are not predicted by its economic use" (sect. 4.11). If not a means, then the behavior belongs to the realm of irrationality.

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But should we accept this last assumption? In moral philosophy the suggestion that non-instrumental attitudes are fundamentally irrational is highly controversial. Value pluralists, such as Raz (1986) and Anderson (1993), have argued persuasively for the existence of forms of moral value that arise from the ideals and attitudes expressed in action itself, rather than its consequences. Anderson, in particular, explores how our use of money might express ideals and attitudes that in certain circumstances might be inappropriate. She claims that in such cases it is rational to refuse monetary exchanges on grounds which are fundamentally non-economic and which reflect the basic values of the agent concerned. This seems right, for surely one can refuse money for some good, no matter how much money is on offer, without being thought irrational. If this is correct, then there would appear to be cases in moral theory not covered by the Tool and Drug Models, at least as described – namely, those where one might rationally choose, on non-instrumental normative grounds, to avoid certain monetary transactions.

Although the account is insightful, my concern is that if it were to be applied in its current form to the normative realm, it would exclude rational non-instrumental attitudes towards money from the possible set of human motives in this area. This would be an undesirable outcome. A further question, which might be pursued elsewhere, concerns the extent to which rational non-instrumental attitudes towards money could have a role in biological explanations of our desire for money.

Authors' Response

Money: Motivation, metaphors, and mores

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Abstract: Our response amplifies our case that money is best seen as both a drug and a tool. Some commentators challenge our core assumptions: In this response we, therefore, explain in more detail why we assume that money is an exceptionally strong motivator, and that a biological explanation of money motivation is required. We also provide evidence to support those assumptions. Other commentators criticise our use of the drug metaphor, particularly arguing that it is empirically empty; and in our response we seek to show how it can be submitted to test – aided by some commentaries which suggest such tests. In addition, we explain, with evidence, why we do not think that the notion of money as a generalised conditioned reinforcer provides a satisfactory alternative to the tool/drug account. The largest group of commentaries suggests alternative instincts on which the drug-like effects of money might be based, other than the reciprocation and play instincts we propose; in our response, we explain why we still prefer our original proposals, but we accept that alternative or additional instincts may indeed underlie money motivation. A final group of commentaries carries the argument further, suggesting extensions to the tool/drug model, in ways with which we are broadly in sympathy. The purpose of the tool and drug metaphors is to encourage reflection on the biological origins of money motivation, and to that extent at least we believe that they have succeeded.

R1. Introduction

Our target article started from four core assumptions (sect. 1): (1) For humans (but not for other species), money has an extraordinary incentive power, similar to that of other motivators such as food and sex. (2) Whereas the incentive power of food, sex, and most other motivators is easily understood in biological terms, that of money is not. (3) A biological explanation of the incentive power of money therefore needs to be provided because "the science of money is still disconnected from the science of life" (to use **Sanabria**'s elegant expression), and the gap needs to be bridged. (4) This task has hitherto been neglected.

From those assumptions we argued, through a consideration of past theories and current data, to three conclusions (sect. 5.4): (i) The "obvious" Tool Theory of money motivation, according to which money is valued because it enables us to fulfil other biologically explicable instincts, is inadequate; (ii) the inadequacies of a Tool Theory can be overcome by combining it with a Drug Theory, according to which money provides illusory fulfilment of other instincts; and (iii) the instincts for which money particularly provides illusory fulfilment are the instincts to trade and to play.

We predicted (sect. 5.4) that our three conclusions would find decreasing levels of acceptance, and a reading of the commentaries bears this out. Similarly, not all of our assumptions were challenged: everyone pretty much agrees that the biological explanation of the money motive has been neglected. However, by no means does everyone agree that such an explanation is needed; some commentators clearly feel that the biology of money has been neglected, is continuing to be neglected, and ought to be neglected further.

Hence, we can divide the arguments in the commentaries into those that challenge our assumptions; those that (broadly) agree with our assumptions but challenge our conclusions, because they challenge the arguments by which we reached them; and those that accept our assumptions and our conclusions as far as they go, but seek to extend them in various ways. Naturally, several of the commentaries involve elements of all three of those positions. In responding to the commentaries, therefore, we reflect on these three approaches in succession, rather than taking each commentary in turn. We start with a response to critiques of our assumptions.

R2. Money is an important human motivator

Several commentators (e.g., **Burghardt**, **Glassman**) challenge our assumption that the money motivation is unique. To some extent these challenges miss the point of our article. For example, we have no problem with the fact that human sexual motivation is decoupled from procreation (**Ross & Spurrett**); that does not undermine its biological continuity in the terms in which we define it (sect. 1.4). A more serious challenge, however, is **Furnham**'s claim that money is not in fact a very powerful motivator. Furnham argues that money is actually a hygiene factor (in the sense of Herzberg et al. 1967) rather than a motivator. In support of this claim, he points out that at least some affective associations with money are in fact negative,

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