Similarly, when discussing FEB 8 ("price regulation has the intended effect") B&P postulate, plausibly enough, that the illusion that rent control doesn't affect housing affordability stems from a mind-set accustomed to the simple causality of small societies and therefore unable to grasp the numerous unintended consequences of a given regulation in a complex society. However, tremendous differences exist (Buturovic & Klein 2010), depending on ideology, in degrees of beliefs in efficacy of an issue often related to rent controls: In this cited study, while 68% of progressive respondents disagreed with the view that "Restrictions on housing development make housing less affordable," only 18% of very conservative voters did so. This suggests that folk beliefs are either more granular than B&P's selection of FEBs (so they are not about price controls, or markets, or regulation in general, but a significantly narrower set of issues), or, even if they do start at the level of abstraction the authors are suggesting, they are easily overwhelmed by information coming from partisan political sources that direct participants' attention towards various facts and mechanisms. (It should be noted that at the time the housing development question was asked, it was not a hot political topic, so these do not seem to be fleeting effects.)

For whatever reason, economic beliefs, at least in the United States, are very strongly related to ideology – to the point that ideology largely overwhelms whatever end-beliefs folk-economic intuitions were supposed to land on. For example, very similar questions posed to the same respondents on the same questionnaire describing likely consequences of reduced supply ("Drug prohibition fails to reduce people's access to drugs" vs. "Gun-control laws fail to reduce people's access to guns") produce significantly different responses depending on the participants' ideologies (Klein & Buturovic 2011). Yet *ideology* is mentioned in the target article only a few times, and each time it is dismissed as an irrelevant variable. This dismissal appears to be based largely on two studies by Petersen (Aarøe & Petersen 2014; Petersen 2012). Given that both of these studies admit that their results go against large and robust empirical literature, this is not good enough. The authors need to explain more thoroughly why ideology is irrelevant for folk-economic beliefs or how it can be accounted for within their framework.

Fear of economic policies may be domain-specific, and social emotions can explain why

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Abstract: People are social animals who value social goods uniquely. In discussions about how economic policies are evaluated by the layperson, it is essential to consider how they may evoke repulsive social emotions such as disgust and anger. We propose that fear of economic policies is not general and that it is specific to items where markets tend to assault certain social values.

In the target article, Boyer & Petersen (B&P) provide an intriguing account of how intuitive systems that are evolutionarily adapted to facilitate cooperation in social exchange can be explanatory of our lay or folk beliefs about economic policies (FEBs). What is inevitably true (and seems to be underemphasized in the article) is that the essential outputs of these intuitive inference systems are a certain group of social emotions – more specifically in this context, emotions such as disgust and anger. The greater efficacy of using emotions to explain the FEBs is demonstrable using the phenomenon of *emporiophobia*, or fear of market economy. The authors mention that the "impersonal" nature of markets makes it difficult for us to know the reputation of the partner of our social exchange, and therefore serves as "threat cue" for such transactions. However, it can be argued that economic markets don't necessarily *prohibit* us from knowing the reputation of our exchange partners (we can know a seller's or a company's reputation), but that a strict market-economy functions on policies which deem such sources of reputation irrelevant. In this case, it is not the absence of social information and emotions that makes market-based transactions of goods repulsive, but that the policies of a market-economy stipulate that these emotions be disregarded – in spite of the good's socio-emotional significance.

Second, the authors say impersonal exchange, such as in markets, "goes against [our intuitive] motivations to generate bonds of cooperation" (sect. 5.4, para. 3) with others. The term "goes against" again needs clarification as to whether it implies that markets force people to not form cooperative bonds or that a strict market economy requires that cooperative bonds should not be taken into consideration in economic markets. The former possibility seems rather odd, as one would suppose that intuitive cooperative bonds (good or bad), by definition occur intuitively (without deliberation or control) with any form of social exchange – regardless of whether market economy allows it.

A market economy that is indifferent to cooperative bonds for specific issues which we are adapted to value differently (e.g., moral norms) (Stanford 2018) is, however, emotionally repulsive. Indeed, we are more adapted to cheater-detection in social domains than in other domains (Cosmides & Tooby 2005). It is likely that we are repulsed by economic markets in the same way that we find individuals of consequentialist decisions less trustworthy (Everett et al. 2016) or atheists less moral (Gervais et al. 2017) – insofar as they violate certain social contracts.

In light of these considerations, we propose that the fear of markets is not general and that it is specific to items for which markets tend to assault certain social values. *Emporiophobia* may be better explained by the intuitive moral emotion of disgust – an emotion elicited not only in response to physically revolting stimuli, but also by social and moral norm violations (Pizarro et al. 2011). For example, the supposedly impersonal market interactions (which differ from the types of *social* exchanges we evolved to value and process) occur primarily through the transfer of monetary assets from the buyer to the seller in return for some goods or services. But, as the authors themselves note in the target article, attempts to acquire certain goods of communal sharing through other means (such as money) would elicit shock. A similar idea, termed the *sacred value protection model* (Tetlock 2003), asserts that certain items in society have sacred value, and when these values are threatened or diminished by secular consideration, people respond with moral outrage (i.e., emotions such as moral disgust and anger).

These emotional reactions are not necessarily due to economic markets not allowing us to track the reputation of social exchangers or because market-based transactions are emotionally unsatisfying (and therefore do not satisfy the necessary inputs for our intuitive inference system), but because the very nature of some of these transactions may undermine social values. Obvious examples include leaving a tip on the pillow of a romantic partner for a job well done, or paying your grandchildren to visit you on your deathbed. Brennan and Jaworski (2015) discuss how disgust can act as a deterrent to market economy – essentially by saying that some people get automatic disgust reactions when considering the market-based transactions (that almost everything can be sold or bought from the market) of certain goods which have *intrinsic dignity* or social value. What indeed has such intrinsic value is culturally defined, and so are FEBs.

Market economics continues to spread into almost every sector of our life – medicine, education, government, law, art, sports, even family life and personal relations – and there are lesser things which money cannot buy (Sandel 2012). The marketization of sacred social items (i.e., they may be purchased with money), and that the resulting transactions of these items are competitive in nature (i.e., driven by notions of profit), may even strongly evoke our disgust response to such phenomena. There is also evidence to suggest that sensitivity to disgust explains significant variation in political ideology – political conservatives are more easily disgusted than liberals, especially regarding policies pertaining to the moral dimension of purity (Inbar et al. 2009). We argue that in considering FEBs about market economy as well as other socioeconomic policies, the role of intuitive emotional evocation in response to the interaction between economic transaction and social value must be emphasized.

How *Homo economicus* lost her mind and how we can revive her

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Abstract: The target article by Boyer & Petersen (B&P) contributes a vital message: that people have folk economic theories that shape their thoughts and behavior in the marketplace. This message is all the more important because, in the history of economic thought, *Homo economicus* was increasingly stripped of mental capacities. Intuitive theories can help restore the mind of *Homo economicus*.

For a long time, *Homo economicus* has lived and struggled to survive in the imaginations of economists. *Homo economicus* – let's call her Alice – is the main character in theories of economic behavior. As economists' ideas took some peculiar philosophical turns, Alice had to adapt and she eventually lost her mind. But cognitive science can help bring life back to the core of economic theory, first by restoring the natural intelligence of *Homo economicus*, and then by delving into the cognitive systems behind her economic thinking.

In the beginning, Alice lived in a vibrant world much like our own. She was a full-blooded human with thoughts, feelings, needs, motives, theories, imagination, compassion, and a lively social life. Adam Smith (1759; 1776), John Stuart Mill (1844; 1848), and other classical economists wrote about Alice as an intellectual equal with the full range of human experience (see also Smith 1998). Of course, Smith and Mill were especially keen on Alice's pursuit of wealth because this was the distinctive province of economics. But, these authors did not assume that Alice exclusively sought wealth, or any other singular goal like pleasure, happiness, satisfaction, or utility. Instead, Alice could pursue a mixture of different goals, just like real people.

> Economics aims at explaining the portion of society that corresponds to the market. Its conclusions are not applicable to those parts of society where wealth is not the main motive of human action. (Mill 1844, p. 589)

In the next wave of economic literature, Alice's situation dramatically changed (reviewed in Stigler 1950). Neoclassical economists insisted that Alice had to fit entirely into certain mathematical equations, no matter how small and uncomfortable they might be, for this was the only way to be rigorous and scientific (see also McCloskey 1991). Alice no longer needed thoughts, ideas, and reason; economic theorists would assume she knew everything. And she was permitted only one overarching goal – maximizing utility – that encompassed every sphere of life.

Strangely, though, neoclassical economists permitted Alice to derive utility from anything at all. If she liked, she could seek bankruptcy, poverty, starvation, injury, or death. "There's no accounting for taste," they said. However, Alice was not allowed under any circumstance to make choices that were inconsistent; this was deemed irrational in a most serious way. Since Alice could want anything, she became unhinged from the realities of life. She developed bizarre and arbitrary preferences about risk, time, equity, civic duty, and many other matters.

The situation got even worse. Some economists questioned Alice's experiences with extreme suspicion. When Alice said she preferred one thing twice as much as another, they demanded proof. They said her experience was not measureable, was merely subjective, and did not belong in rigorous theories. The only thing they could *observe* was her choices, which revealed only the order of preferences; anything more would be too speculative to indulge.

> Modern economic theory has insisted on the ordinal concept of utility; that is, only orderings can be observed, and therefore no measurement of utility independent of these orderings has any significance. (Arrow 1983, p. 75)

Another time, Alice shared one of two apples with a hungry friend, pointing out that the friend would enjoy it more than Alice would enjoy eating a second one. Some economists scoffed: It was impossible to compare one person's utility with another's. Some even extended this skepticism to all of society, saying the very notion of the common good is fallacious (Riker 1982).

> Interpersonal comparison of utilities has no meaning. (Arrow 1951, p. 9)

Alice had no choice. She emptied her mind of proper thoughts, concepts, theories, and reason; she replaced them with spontaneous knowledge and a few probabilities. Alice gave up her natural motivations to seek food, safety, and relationships, and she subsumed everything in one consistent utility function. She lost her sympathy for other people's pressing needs for food and shelter because she could not compare their utilities to her own.

Little by little, piece by piece, Alice lost her mind. *Homo economicus*, the economic actor, became a utility-maximizing zombie, an empty shell with little thought, no imagination, and arbitrary, unrecognizable motives.

> Economic theory has been much preoccupied with this rational fool decked in the glory of his *one* all-purpose preference ordering. (Sen 1977, p. 336, italics original)

Nowadays, behavioral economics has increasingly found that utility zombies do not always match real people's behavior. So, there is broad consensus that Alice needs at least some of her mind back. But the predominant approach is to add more and more irrationalities and arbitrary preferences to the utility zombie. The problem is that this still leaves *Homo economicus* with few cognitive abilities. A real mind that performs in the real world cannot be made of irrational errors and arbitrary preferences any more than it can be made of unadorned utility maximization (see also Todd & Gigerenzer 2007).

Instead, we need to rediscover the mind of *Homo economicus*. Cognitive science can help view people's economic thinking from a fresh perspective. Rather than neoclassical economics, it can begin with the ordinary idea that people theorize and learn about the world; they have multiple evolved motives related to health, reproduction, and biological fitness; their motives have different magnitudes; and they can compare different people's welfare in order to effectively cooperate and form relationships. Cognitive science illuminates these basic mental faculties, including how people theorize about causes, invent tools, seek food and shelter, court and assess mates, care for children, and reason about others' minds (reviewed in Pinker 1997). Building on this foundation, we can study the intuitive theories that allow people to theorize and learn about economics, like how to bargain with merchants, make a living, save resources for hard times, specialize in a profession, evaluate tax policies, and so on.

Boyer & Petersen's (B&P's) target article has made a bold and much-needed move in this direction by proposing some contents of people's folk economics, especially the different beliefs that shape citizens' political views about major economic policies.