On the Heritability of Choice, Judgment, and “Irrationality”: Are People Born to Live on the Edge Or in the Mainstream?

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We use a classic twins study design to examine genetic effects on a broad range of judgment and choice phenomena, including key influences on consumer decision making. We find a significant heritable effect on (a) preferences for compromise (but not perceptually dominating) options, (b) choosing a sure gain over a gamble, (c) preferences for a feasible though dull assignment (in the near distance), (d) maximizing (versus satisficing), and (e) preferences for utilitarian (versus hedonic) options. Conversely, we identify phenomena, such as judgment heuristics, that are not heritable individual differences. We discuss the implications of our findings and suggest directions for future research regarding the role of genetics in decision making.

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SESSION OVERVIEW

“Inherent preferences” (Simonson 2008a, 2008b) refer to preferences that are established prior to a decision context and are thus distinguished from “constructed preferences” (e.g., Bettman et al. 1998). Following a lively debate on the subject in the JCP Dialogue (Summer 2008) as well as a lively ACR session in October 2007, the next challenge is to start an empirical research program on the determinants of inherent preferences. The objective is to gain a better understanding of often dormant inherent preferences (e.g., the preference for the experience involved in using a motion-sensitive remote that existed before Nintendo introduced the Wii videogame system) and the manner in which they may be revealed. That is the overarching goal of the proposed session.

There are different types of inherent preferences, ranging from previously constructed preferences to “hard-wired,” inherited preferences. Regardless of the specific type, it has been proposed that dormant (i.e., yet to be uncovered) inherent preferences are most likely to be revealed through product experience, rather than during the decision process. The first paper in the session, by Chris Hsee and Adelle Yang, examines alternative sources of information regarding future experiences and corresponding inherent preferences. In particular, Hsee and Yang show (in a series of already completed studies) that other consumers’ subjective experience evaluations with an object, especially if those were elicited in separate (rather than joint) option evaluations, are better predictors of a target consumer’s inherent preference for the object than if the consumer him/herself tries to assess the object based on its objective attribute values.

The two other papers in the session use different methodologies to examine specific inherent preferences that can be described as hard-wired or even genetically-based. Shane Frederick examines the impact of inherent sex differences on time preferences and risk attitudes. Using his “Cognitive Reflection Test” or CRT (Frederick, 2005), he disentangles inherent vs. acquired origins of such fundamental differences. He also shows that, after controlling for CRT, the female “advantage” in time preference widens, and the female “deficit” in risk tolerance diminishes. The data further yield the surprising result that in the domain of losses, women are more risk-seeking than men. These studies have been completed.

Itamar Simonson, Aner Sela, and Gary Swann examine genetic influences on consumers’ inherent preferences. Contrasting the preference similarity between identical twins and nonidentical twins, they identify the types of consumer preferences for which genetics appears to be a significant determinant and those that are not inherited. In particular, according to the data already available (at this point, about 70 pairs of each twin type), the tendency to not-compromise appears to have a significant genetic origin, whereas the tendency to not/seek asymmetrically dominating options does not differentiate identical and nonidentical twins. This finding is consistent with the notion that the reasoning function (involved in the decision whether to compromise) evolved more recently than the perceptual system (involved in the perception of relative attractiveness), which is more universal and less dependent on individual genes.

We believe that the session will be of much interest to attendees of the ACR conference regardless of their particular area of research (i.e., not just BDT types). It explores a new domain, which has not previously received much attention, and the various studies and sources of data are rather novel to our field and may lead to further research.

Our discussant will be Drazen Prelec of MIT, who will present his insights on the subject and the papers and moderate what is likely to be a lively discussion.

All participants have agreed to their role in the session.

EXTENDED ABSTRACT

“The Supremacy of Subjective Evaluations as Indicators of Inherent Preferences”

Christopher Hsee, University of Chicago, USA
Adelle Yang, University of Chicago, USA

Prior research suggests that inherent preferences are most likely to be revealed through experience. This project examines alternative predictors of experience. Suppose that you are shopping for a stereo system and have narrowed your options to two models. The two models are identical, except for the following: Model A can be remotely controlled and Model B cannot, whereas Model B delivers more output power than Model A. Since you are shopping online, you cannot hear their sound and therefore cannot tell how much more powerful Model B is relative to Model A. However, you could obtain one of the following three types of information regarding their sound powerfulness: (a) Objective specifications, that is, objectively measured output wattages (e.g., Model A is 100 watts and Model B is 200 watts); (b) Subjective ratings elicited in comparison, as obtained using the following procedure by an impartial research firm: A group of consumers similar to you were asked to audition and to compare the two models and then rate their sound powerfulness. You are then given the mean ratings of the two models; (c) Subjective ratings elicited without comparison, as obtained using the following procedure by an impartial research firm: Two groups of consumers similar to you were each asked to audition one of the two models without comparison. Each group then rated the sound powerfulness of the model they had auditioned on the 10-point scale. You are then given the mean ratings of the two groups/two models.

Suppose that you can receive only one of these three types of information, which one do you prefer, and which type of information will enable you to choose the model that best matches your inherent preferences and maximizes your overall satisfaction? The present research seeks to answer questions like the above. Through a large-scale experiment involving stimuli analogous to those described in the example above, we find, among others, the following two results. First, most consumers prefer objective specifications to subjective ratings elicited in comparison, and most consumers prefer subjective ratings elicited in comparison to subjective ratings elicited without comparison. Second, in contrast to their lay preferences, our study shows that consumers who receive the subjective ratings without comparison are most likely to choose the option that renders the best consumption satisfaction, and those who receive the objective specifications are least likely to do so. The reason is: subjective ratings without comparison best match consumers’ inherent preference during consumption. Consump-
tion is a matter of subjective experience rather than objective
specifications, and consumption usually takes place in the non-
comparative mode rather than in the comparative mode.

As will be discussed in presentation, this research both ad-
vances theory and yields significant practical implications. The-
oretically, the present research extends three previous lines of
research, relating not only to inherent preferences, but also to “lay
rationalism” (Hsee et al. 2003), specification seeking (Hsee et al.
2009), and distinction bias (Hsee and Zhang 2004). In particular,
the research shows that non-comparative subjective information
provided by others can be better than objective specifications,
because such subjective information best matches consumers’
inherent preference during consumption. Practically, the present
research suggests a new way of conveying information to potential
buyers, especially online buyers. Currently, most online stores do
provide objective specifications of their products, but do not often
provide other consumers’ (subjective) evaluations. Even if other
consumers’ evaluations are provided, they are not elicited system-
atically. Our research suggests a need for independent research
firms to elicit non-comparative subjective ratings of the relevant
attributes of target products, and for marketers to provide potential
buyers such subjective information rather than objective specifi-
cations.

“Antecedents of Inherent Preferences: Cognitive Reflection
and Other Sex Differences”
Shane Frederick, Yale University, USA

For most decision theorists, inherent dispositions (to avoid
risk, maximize payoffs, seek variety, live close to campus, and
minimize rent, ...) are taken as a given, and analyses revolve around
the contextual features that highlight or suppress varied consider-
ations which alter the weight that competing motives receive. By
contrast, evolutionary biologists who study decisions usually focus
on explaining the origins of the motives themselves in terms of
historical selective pressures which may apply differently to differ-
ent groups (e.g., women vs. men). In a distinction championed by
Simonson (2008), decision theorists usually focus on “constructed
preferences,” in which choices are seen to shape preferences,
whereas biologists focus on “inherent preferences,” which choices
merely reveal. Inherent preferences can accommodate constructed
preferences provided the observed behavior is not so inconsistent as
to invalidate the putative existence of the construct being assessed.
Moreover, both approaches can coexist. For example, there may be
evolutionary reasons why individuals are more risk seeking in
losses than gains, but you can also “create” or accentuate this
preference by focusing respondents attention on losses rather than
on, say, probability or expected value.

In work which falls within the “inherent preferences” para-
digm, Frederick (2005) found: (1) that scores on a “Cognitive
Reflection Test” predict fundamental decision making characteris-
tics, such as time preferences and risk attitudes, and (2) that males
score much higher on this test. Those two facts jointly imply a third
result which that paper did not discuss: (3) that controlling for CRT
scores may modify conclusions about sex differences. For example,
since lower scoring people are less patient, and since women score
lower than men, the finding that men and women were equally
patient suggests that sex would emerge as a significant predictor of
time preferences if CRT scores were controlled. Indeed, for any given
CRT score, females were significantly more patient than males.
Thus, sex differences in CRT act to mask other (perhaps more
essential ) sex differences that affect time preference. These results
suggest a rethinking of claims that sex plays a small role in
determining time preferences, such the conclusion from Silverman’s
meta-analysis (2003, p. 459) that “gender accounts for only a small
proportion of the variance in the ability to delay gratification.”

In the domain of risky choice, including CRT as a covariate
also has opposite implications for conclusions about sex differ-
ences. Specifically, since women score lower than men, and since
lower scoring respondents are more risk averse, the marked sex
differences in risk preferences is due partly to CRT differences (that
is, to the cognitive variables that mediate performance on the CRT).
Thus, though controlling for CRT does not affect the qualitative
generalization that women are more risk averse than men (Byrnes,
Miller, & Schafer, 1999), it does suggest that sex, per se, becomes
a less potent predictor of risk preferences once CRT scores are
controlled. Risk attitudes were assessed in terms of the proportion
times each respondent chose a gamble over a sure reward with
smaller expected value (in choices such as $100 for sure vs. a 75% chance of $200, $100 for sure vs. a 3% chance of $7000, and so on).
Men chose the gambles significantly more often than women (43% vs.
30%; p<0.0001), but these differences were smaller after CRT
was controlled for.

A final analysis examined the effects of CRT and sex on risk
seeking in the domain of losses. Surprisingly, there is next to no
research on this topic. Even more surprisingly, the general finding
that women are more risk averse than men is reversed in this
domain. When faced with hypothetical choices between a sure loss
and a gamble with a more negative EV (e.g., between losing $100
for sure or taking a 3% chance to lose $7000), women chose the
riskier gamble significantly more often than men (54% vs. 45%;
p<0.0001). A control for CRT did not affect the average size of this
effect, but did reveal that the sex difference increased with CRT
score: among men and women who scored a “0” (out of 3), women
chose the gambles only slightly more often than men (53% vs.
49%), but among those scoring a 3, the difference was considerable
(55% vs. 42%; p<0.05).

Evolutionary or “socio-biological” accounts can accom-
date some of the presented findings. For example, Baumeister
(2008) conjectures that men’s greater appetite for risk may reflect
their historically larger reproductive upside of big payoffs. For
example, a man might rationally prefer a 3% chance of 70 over 1 for
sure if those reward units translate into offspring (since a man could
father 70 children). However the upside of the great payoff is much
smaller for women, who cannot birth more than a dozen or so
children. Moreover, as a consequence of their rationally greater
appetite for risks, males may expect to die sooner, which could help
explain why males discount the future more than women (holding
cognitive ability constant).

However, much more investigation is needed to separate the
truthful components of these reasonable, but ad hoc conjectures.
First, the evolutionary story does not account for the large effects
of cognitive ability on such preferences. Second, sex differences in
risk taking may be explained in terms of differences in probability
weighting (see Fehr-Duda, De Gennaro, & Schubert, 2006), not
differences in the curvature of the underlying value function. Third,
the finding here that women are more risk-seeking in the domain of
financial losses is not readily fitted into the customary evolutionary
accounts.
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Most consumer preferences may appear too specific and context-driven in nature to be determined (in part) by genes. We were probably not born with any microwave oven gene, a Coke versus Pepsi gene, or even a peach ice cream gene. One does not need to be a strong (preference) "constructionist" (e.g., Bettman et al. 1998; Simonson 1993; Lichtenstein and Slovic 2006; Tversky et al. 1988) to know that most such product preferences are acquired, based largely on things such as experience, adaptation, social influence, and information. However, recent research does suggest the possibility that genetics plays a role in certain preferences and choices, such as jazz music (Tesser 1993), alcohol (e.g., Prescott and Kendler 1999), and voting behavior (Fowler et al. 2008). Moreover, there is robust evidence that intelligence (Bouchard 1996) and personality, especially the extroversion and neuroticism factors (e.g., Pedersen et al. 1988), are largely (~50%) genetically determined. The genetic origins of personality, in turn, lead to other predictable differences, including people’s well-being (Weiss et al. 2008).

In the current project, we identify types or categories of preferences that might be, in part, genetically determined. Although we cannot have a strong theoretical basis for predicting that one particular preference will have a genetic component and another will not, we seek types of preferences for which we could develop reasonable hypotheses regarding genetic influence, because they appear to represent potentially inherent differences. To clarify, consider, for example, the difference between the tendency to compromise (versus selecting an “extreme” option from a given set) and the tendency to perceive an asymmetrically superior or dominating option as attractive (Huber et al. 1982; Simonson and Tversky 1992). Prior research has shown that the decision whether to compromise is conscious and “cognitive” whereas perceptions of (and preferences for) asymmetrically dominating options are “perceptual” and mostly unconscious (Dhar and Simonson 2003; Simonson 1989). Considering that the perceptual apparatus has evolved much earlier than the reasoning system, the latter is likely to be associated with greater variance across different pools of genes (e.g., families).

Accordingly, we expect to observe a stronger genetic effect on the tendency to not-compromise than on the tendency to select dominating options. Similarly, we selected several other preference types for which we believe that genetic influences could emerge and be explained based on general principles. These preference types include: (a) the tendency to select a variety of options across consumption occasions (e.g., Simonson 1990); (b) the tendency to balance rather than highlight/“go all the way” (Dhar and Simonson 1999); (c) consumer experiences that involve exhilaration/stimulation, such as riding motorcycles, roller coasters, and extreme sports, (d) artistic preferences, and (e) unique flavors (e.g., licorice, cilantro, and dark chocolate). In addition, we test whether certain judgment biases (e.g., representativeness, anchoring) have a genetic component.

Alternative methodologies for measuring the relative influence of genetics and the environment, and their respective shortcomings, have been discussed and debated extensively (e.g., Billings et al. 1992; Borkenau et al. 2001). The most commonly used method involves contrasting identical (or monozygotic) twins with nonidentical ( dizygotic) twins (e.g., Fowler 2008; Weis et al. 2008). If identical twins (with 100% identical chromosomes) tend to be more similar than nonidentical twins on a certain dependent variable, controlling for shared environmental factors, then one can conclude that that DV has a genetic component. It is noteworthy that this methodology is not flawless, for example, because identical twins have been shown to meet (later in life) more often, and they might be treated differently by others (including their parents). We will use suitable covariates to try to control for these potential confounds.

We rely on this methodology in the current ongoing project, using the SRI International Twins Registry. Participants (N=140 pairs; expected final N=200 pairs) complete a 30-minute questionnaire online, which includes a broad range of previously pretested tasks from the decision making literature. Our data analysis has focused initially on the contrast between preferences for compromises and perceptually dominating options. The results so far appear to support the proposition that compromising, but not dominance, have a significant genetic component. More generally, this project has the potential to provide “deep” insights into the determinants of inherent preferences and enhance our understanding of the drivers of consumer decision making.