



Published in final edited form as:

*Am J Bioeth.* 2023 July ; 23(7): 53–55. doi:10.1080/15265161.2023.2207518.

## Curiosity and Uncertainty Resolution: Inflating the Perceived Utility of Genetic Information

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When considering the question, “Is it just for a [genetic] screening program to give people all the information they want?” it is first necessary to understand how the information is being presented and how it is perceived by people. Companies offering genetic screening appear to market their products by targeting people’s curiosity for self-knowledge and aversion to uncertainty. For example, 23andMe brands their genetic testing kits with the saying “welcome to you,” as though one is given the opportunity to be introduced to themselves (23andMe, 2023). The company LifeView brands their services for polygenic embryo screening and prioritization with the slogan “choice over chance,” as though one gains control over uncertainty by selecting one’s embryo on the basis of polygenic scores (LifeView, 2023). But how much self knowledge and control does one really gain from genetic information? Though the ethics and personal utility of genomic screening are debated, the aim of this commentary is not to provide an answer, but rather to raise awareness about ways in which the perceived value of information can at times outweigh its personal utility and still nevertheless be pursued. Bunnik, Janssens, and Schermer (2015) assert that “genomic information has personal utility if and only if it can reasonably be used for decisions, actions or self-understanding which are personal in nature” (320). This definition leads them to question the value of genetic screening by distinguishing between its “perceived utility” and “personal utility;” in other words, expected personal utility vs. personal outcome utility. That is, consumers and patients may expect personal utility in receiving genetic information but may not actually experience any from acquiring this information. Psychological experiments have demonstrated instances in which curiosity—defined as the desire to fill in an information gap (Loewenstein 1994)—leads people to seek information that, at times, is without personal utility and actually can have a negative effect (Hsee and Ruan 2016). In this commentary, we draw directly from Hsee and Ruan’s (2020) research on curiosity to understand the psychological motives that lead people to seek out information and we apply it to genetic screening. In one experiment, Hsee and Ruan (2016) had participants wait for a research study to start, 10 pens were positioned on a table in front of the participants during the supposed waiting period. Participants were told that the pens were left over from a previous study and that they could play with them if they wanted to kill time. In reality, the study had begun, and half of the participants were assigned to a certain-outcome condition while the other half were assigned to an

uncertain-outcome condition. In the certain-outcome condition, participants were told that the 5 red pens would administer a harmless, but painful electric shock, while the other 5 green pens would not deliver a shock. In the uncertain-outcome condition, participants were presented with 10 yellow pens and were told that half of them would deliver an electric shock, while the other half would not (participants were uncertain as to which pens would deliver the shock or not). The researchers ended up counting the number of pens each participant had clicked and found out that participants in the uncertain-outcome condition clicked 5.11 pens on average compared to participants in the certain-outcome condition clicking an average of only 3.04 pens. Therefore, in the uncertain outcome condition participants should have on average experienced 2.56 shocks while those in the certain-outcome condition on average experienced 1.74 shocks. These results suggest that participants were willing to endure significantly more shocks simply to satisfy their curiosity and resolve the uncertainty as to which pens would lead to which outcome. Researchers have conducted multiple studies demonstrating similar findings (Hsee and Ruan 2016, 2020; Kruger and Evans 2009; Tversky and Shafir 1992) namely that people's desire to resolve uncertainty can not only outweigh a lack of personal utility, but may even (knowingly) be negative. We propose uncertainty resolution as a potential psychological motive to understand the gap between perceived and personal utility regarding genetic testing. Uncertainty resolution is the subjective pleasure of resolving uncertainty by filling an information gap, and personal outcome utility is the value provided by the return of genetic results (see Hsee and Ruan 2020 for a more thorough review of their research). As demonstrated in the pen shock study, the drive to resolve uncertainty can not only outweigh any personal utility, but even result in experiencing negative outcomes. Bunnik, Janssens, and Schermer (2015) distinguish between perceived and personal utility, by focusing on the idea that people may lack a proper understanding of the limited personal utility provided by genetic screening. While this concern certainly needs to be addressed, in this commentary, we focused on first explaining the desire to seek information (i.e., genetic testing) as stemming from the psychological motive of uncertainty resolution utility, which we propose carries ethical implications for how genomic companies, genetic counselors, researchers, and the media frame the perceived value of genetic information. We caution that merely presenting people with the possibility of learning genetic information about themselves or their children, will drive them to desire that information (uncertainty resolution), which in turn, will inflate the perceived utility of genetic screening. We hope, in describing this line of research, that future work aiming to assess the value of genetic screening will account for the psychological motive of uncertainty resolution and consider its ethical ramifications.

## References

- 23andMe. 2023. DNA genetic testing for health, ancestry and more. 23andMe. Accessed April 26, 2023. <https://www.23andme.com/>.
- Bunnik EM, Janssens ACJ, and Schermer MH. 2015. Personal utility in genomic testing: Is there such a thing? *Journal of Medical Ethics* 41 (4):322–6. doi:10.1136/medethics-2013-101887. [PubMed: 24872596]
- Hsee CK, and Ruan B. 2020. Curiosity and its implications for consumer behavior. In *Continuing to broaden the marketing concept (Review of Marketing Research)*, ed. Iacobucci D, Vol. 17, 223–39. Bingley: Emerald Publishing Limited.

- Hsee CK, and Ruan B. 2016. The Pandora effect: The power and peril of curiosity. *Psychological Science* 27 (5): 659–66. doi:10.1177/0956797616631733. [PubMed: 27000178]
- Kruger J, and Evans M. 2009. The paradox of Aplysia and the pursuit of unwanted information. *Journal of Experimental Social Psychology* 45 (6):1173–9. doi:10.1016/j.jesp.2009.06.009.
- LifeView. 2023. Better tests better outcomes. LifeView by Genomic Prediction. Accessed April 26, 2023. <https://www.lifeview.com/>.
- Loewenstein G 1994. The psychology of curiosity: A review and reinterpretation. *Psychological Bulletin* 116 (1):75–98. doi:10.1037/0033-2909.116.1.75.
- Tversky A, and Shafir E. 1992. The disjunction effect in choice under uncertainty. *Psychological Science* 3 (5): 305–10. doi:10.1111/j.1467-9280.1992.tb00678.x.