



The rationality of literal Tide Pod consumption

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Abstract

At the conclusion of 2017, to the dismay of journalists, pundits, and academics, large numbers of adolescents began consuming Tide Pods, a form of laundry detergent that is candy-like in appearance. This paper argues that purposeful consumption of laundry detergent may in fact be individually rational for adolescents. The consumption of Tide Pods may allow adolescents to successfully signal status in accordance with the Handicap Principle, which explains the beauty of a peacock's tail and the practice of stotting by gazelles in the wild. The Handicap Principle is also a common explanation of adolescents' willingness to engage in dangerous activities, like drug use. A subtext of the thesis of this paper is the veracity of rational choice explanations in unconventional contexts distant from its original applications.

Keywords Tide Pods · Veblen good · Conspicuous consumption · Handicap principle

JEL Classification Z13 · B52

1 Introduction

The social phenomenon of adolescents on social media eating laundry detergent, especially Proctor & Gamble's Tide Pods (the "Tide Pod Challenge"), has been covered extensively by conventional media sources. However much it is true that "all publicity is good publicity," Proctor & Gamble has actively discouraged this practice, as eating laundry detergent pods, which contain a concentrated form of detergent, is somewhat dangerous. To this end, the firm hired New England Patriots tight end Rob Gronkowski to admonish viewers in an online video, telling them "What the heck is

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going on, people? Use Tide Pods for washing. Not Eating.”¹ This raises the question of why adolescents began engaging in this behavior in the first place.

This paper takes the position that the underlying motivation for consuming Tide Pods is closely analogous to the evolutionary reasons for other risk-seeking behavior on the part of adolescents, especially males, which leads to other dangerous behaviors, including substance abuse. Risk seeking behavior is a means of status seeking behavior which can credibly communicate underlying quality of genes. Imposing costs on one's self to signal is known in evolutionary biology as the Handicap Principle (Zahavi and Zahavi 1997). Diamond (1992, pp. 192–206) spells the argument out as it applies to substance abuse for the educated lay audience. The consumption of Tide Pods is a natural extension of the analysis.

However, generally speaking, status-seeking behavior is not at the forefront of most presentations of rational choice theory, even though conspicuous consumption has been part of economics since Veblen (1899). Frank (2005) classifies departures from rational choice theory as “with regret” and “without regret” and discusses issues that will be discussed here under the umbrella of “relative consumption” (2005, pp. 27–31), and as such, are “without regret.” Although status does not always appear in narrow, baseline presentations of rational choice theory, it does not violate any fundamental assumption, such as transitivity of preferences. That is to say, status seeking can be thought of as rational. I follow Collins (2017) in seeing status seeking behavior as comprehensible and rational from the standpoint of economic theory. The “problem” with arguing that claiming a social phenomenon is explained by differences in weights on arguments in a utility function is that it violates Stigler and Becker (1977), from the standpoint of the economic actor, who is driven to risk-seeking.² However, the position taken here is that the scientific theory and evidence behind this violation are sufficiently strong to set aside this methodological argument. Moreover, since the theory in question specifies in advance which and whose preferences are expected to change, the primary issue raised by Stigler and Becker (1977), that changing preferences as an explanation could simply be used to explain anything, does not hold for this particular question.

While this paper can be read literally, its underlying motivation is a challenge to the meaningfulness of the rational choice model when extended distantly from its conventional uses. If there are reasonable rational choice foundations for eating laundry detergent, then the existence of reasonable rational choice foundations in other unconventional settings may not be especially persuasive, in the absence of additional strong supporting direct evidence in favor of such hypotheses.

The following section will provide background on the scope of the Tide Pod phenomenon. It will also describe the two antecedents for the Tide Pod Challenge, the Cinnamon Challenge and the Ice Bucket Challenge. It will also describe one previous rational choice explanation of poison consumption and consider the relationship between the argument found here with other provocative statements from rational choice theory. Section III will provide the scientific theory linking substance abuse,

¹ https://www.youtube.com/watch?v=-DrC_PF_3Lg.

² The “preferences” of the genes in this context may remain constant, however, with the changes in preferences of the economic actor driven by psychological responses to changes in relative costs in the environment.

adolescent risk seeking, status seeking, and evolutionary theory. It then builds on the economics of status seeking and positional goods in order to speak about speculative further implications. Speculatively, in the rational choice framework, the best rationale for why the Tide Pod Challenge has negative economic effects is not paternalism, but rather its imposition of externalities. Section 4 concludes.

2 Background information

Tide Pods are a brand of laundry detergent pod, which packages laundry detergent in single use dissolvable plastic for sake of convenience, first appearing in stores in 2012. Due to their colorful branding, concerns were quickly raised regarding whether children would confuse them with candy (Consumer Reports News 2013), and subsequently this was satirized by humor websites such as *The Onion* and *CollegeHumor*. The viral joke picked up in its intensity in the waning days of 2017, and videos of adolescents actually trying to consume Tide Pods proliferated in early January 2018. The popular press reported on the phenomenon widely (e.g., Dahir 2018; Bever 2018; Abad-Santos 2018), while social media websites such as YouTube and Facebook determined that these videos violated their respective Terms of Use policies and deleted them (Gstalater 2018).

While there were over 10,000 exposures of children five or younger to laundry detergent pods in 2017, year-over-year data for this subset of the data is down through the first 3 months of 2018 (American Association of Poison Control Centers 2018a). Owing to the fact that the online videos are primarily adolescents, the real spike that occurred is amongst teenagers. Through March, 2018, the same organization reports 215 cases involving teenagers (American Association of Poison Control Centers 2018b; more recent data does not appear to be available) Following the original release of laundry detergent pods, widespread evidence in science and medicine appeared showing that the ingestion of laundry detergent pods can (although not necessarily *will*) cause serious injury (Huntington et al. 2014; Smith et al. 2014; Valdez et al. 2014; Karel et al. 2015; Stromberg et al. 2015; Yin et al. 2015; Sjogren et al. 2016), and are more dangerous than conventional detergent, since the detergent is more concentrated.

Because social media websites have removed the videos from their websites, it is difficult to conclusively assess exactly how popular the meme was at its peak. The website *KnowYourMeme*, which has chronicled the phenomenon at length, including a few remnant examples of the original videos. The site reports that one Facebook video received 3.3 million views over 5 days before Facebook removed the video (KnowYourMeme 2018). And while social media firms ban videos individuals actually trying to eat laundry detergent pods, they do not ban posting bait-and-switch videos of people *pretending* that they will eat Tide Pods. Presumably, these bait-and-switch videos would serve as a lower bound estimate for the view count authentic videos of this type would achieve, were they still allowed. View counts for these bait-and-switch videos, as of April 2018, include 2,051,535 for “I Take The Tide Pod Challenge” by user Jake Iannarino, 1,231,401 for “FAMILY EATS TIDE PODS CHALLENGE” by user Oribellyohhs, and 253,114 for “Tide Pod Challenge! (FOR TEH MEMES)” by

user CistReactz. Also allowed are videos of people reacting to or discussing other videos of people trying to eat Tide Pods, which presumably function as another lower bound. “TIDE POD CHALLENGE REACTION!” by user Milana Coco has received 933,185 views and “YOUTUBERS REACT TO TIDE POD CHALLENGE” by user FBE has received 3,468,647 views.

There are some instances of consumers poisoning themselves by being fooled by packaging, branding, and marketing of consumer goods like shampoo which makes them appear similar to food (Basso et al. 2014). At least one commentator has suggested this was part of the reason behind the phenomenon (Abad-Santos 2018). But while this may explain some cases (especially small children), it is an unsatisfactory reason why the phenomenon is popular to put videos on social media among adolescents. It is the contention of this paper that the underlying reason for adolescents to do this is to publicly engage in risk seeking behavior as a means of seeking status, and as such is very similar to adolescent substance abuse. If status is an argument belonging in the utility function, it is straightforward to interpret the consumption of laundry detergent as entirely rational behavior. Objecting to putting yourself at risk in exchange for higher status would simply be a normative argument.

Predecessor social media challenges of the Tide Pod Challenge include the Cinnamon Challenge, wherein the subject attempts to hold a spoonful of cinnamon in one’s mouth for a full minute, and the Ice Bucket Challenge, wherein the subject has a bucket of ice water poured over them (the latter ostensibly to raise awareness for Amyotrophic Lateral Sclerosis). While both of these challenges may be painful, neither received as much attention to traditional news sources, likely due to the lower level of perceived danger involved in performing them. It should be noted, however, that pediatrics researchers have argued that the Cinnamon Challenge poses tangible health risks, and has sent several adolescents to the emergency room (Grant-Alfieri et al. 2013). While research to this effect has not been pursued, phenomena outside social media could include eating challenges or drinking games.

The existent social scientific literature besides this paper on rational choice and the ingestion of poison includes the analysis of Sassywood (Leeson and Coyne 2012).³ This analysis finds that the superstitious beliefs about the properties of poisoning tree bark, which is believed in Liberia to supernaturally assess guilt in the course of informal criminal justice proceedings, is a superior mechanism to formal criminal justice due to the very low levels of institutional quality in Liberia. The mere existence of the belief, regardless of its truth, allows for the informal mechanism to function. Leeson (2012) argues that a similar mechanism functioned with ordeals in Medieval Europe. This argument differs from my own such that Leeson and Coyne (2012) argue that ingesting poison is rational in the sense that it offers a least-bad mechanism of criminal justice given economic and cultural constraints of certain areas of the world, while I argue that ingesting laundry detergent can confer social advantages via credible signals of status and quality of genes.

A model close to my own is Ronay and von Hippel (2010), who argue that male skateboarders take physical risks as I argue that adolescents consume Tide Pods.

³ Of lesser relevance here is a philosopher puzzle by Kavka (1983) related to the rationality of poison consumption.

Vincke (2017) provides an extensive literature view and discussion of the various sexual signals communicated with “dark consumption” goods, namely alcohol and cigarettes, but does not focus narrowly on the same psychological mechanisms as I do. Empirical evidence, in general, is mixed on the issue, with some finding evidence in favor of such models (e.g., Kelly and Dunbar 2001; Farthing 2005), and others not (e.g., Wilke et al. 2006; Borkowska and Pawlowski 2014).

This paper also directly speaks to a more methodological or philosophical question of whether certain behaviors, the ends of which appear to be dictated by underlying human psychology (not conscious human decision-making) should be thought of as “rational.” Kenrick and Griskevicius (2013, pp. 143–160) explicitly present the view that unconscious status-seeking behaviors should still be thought of as rational, as is also assumed here. But on the other hand, in describing similar phenomena, Ridley (1996: passim, see especially, pp. 127–147) sees the *logic* of rational choice playing out at the level of genes, with rational choice inapplicable to humans themselves in those cases. Whether a given end is chosen consciously, i.e., *not* cases where your psychology is making the choice of the end for you, is a necessary precondition for a behavior to be called “rational” is in some sense a matter of semantics, but it is ostensibly implied in models of rational choice going back to von Mises (1949). This is despite others working in this tradition who have implied that conscious choice of a given end is *not* necessary for a behavior to be rational (Alchian 1950; Leeson 2017; c.f. Becker 1962). The starkness of the discussion of Tide Pods throws this point into sharp relief.

3 Behavioral analysis and implications

Adolescents, especially males, disproportionately engage in various risky behaviors (Steinberg 2008; Byrnes et al. 1999). A predominant theory explaining this fact is that it is an evolutionary strategy for attaining status and the ability to find a mate (Wilson and Daly 1985; c.f. Rubin and Paul 1979). One exposition of this theory⁴ is that engaging in risk taking is a credible signal of underlying relative gene quality (Baker Jr and Maner 2008, 2009), and thereby, status. Status games generally follow the same underlying logic of the beauty of a peacock’s tail; the most conventional economic mechanism following this logic is conspicuous consumption (Sundie et al. 2010⁵; see also De Fraja 2009). A less well-known example in the animal kingdom is the practice of “stotting” by gazelles in the wild, where the gazelle will jump into the air to signal that it can escape from predators even as it deliberately slows down. These kinds of behaviors are known as the Handicap Principle (Zahavi 1975; Zahavi and Zahavi 1997). While there are other evolutionary theories for different aspects of drug use (e.g., Durrant et al. 2009), status competition of this sort is a common

⁴ For an exposition of a very similar theory, that low socioeconomic status creates a cue for individuals to engage in risky behavior, can be found in Griskevicius et al. (2011). As long as the link between status seeking and risk remains, the arguments in this paper remain the same. The other exposition of the mechanism was emphasized because it appears to be more predominant in the literature.

⁵ I should note that experimental evidence using mating priming has failed to replicate (Shanks et al. 2015), but this is one small piece of a core concept within the field of evolutionary psychology.

explanation of drug use by adolescents (e.g., Hagen et al. 2013; Greitemeyer et al. 2013). For a scholarly but accessible discussion of this argument, see Diamond (1992, pp. 192–204).

The empirical content of the position presented here is that Tide Pod consumption would be expected to be an overwhelmingly male and adolescent activity. If it was not, it would be evidence against the theory as a good explanation. Due to the policies of the social media websites, however, it is not possible to test this effectively in practice. But because falsifiability is a logical feature of a theory (Popper 1959), the argument presented here is not a “just-so story”—in principle, it is a falsifiable theory, although I am unable to provide direct empirical evidence of my claims.

Collins (2017) argues that many ostensible abnormalities observed with respect to risk are readily explained as status seeking behavior.⁶ He argues that the importance of status explains, for example, the low wages among drug dealers found by Levitt and Venkatesh (2000). Even if the risk premium earned for engaging in illegal activities appears to entirely be outweighed by the risk incurred, those engaging in these activities may correctly perceive, perhaps unconsciously, that doing so provides them with the highest probability for achieving sufficient income and status to find a mate.

The appropriate intuition for the behaviors, however, remains that of the peacock’s tail. The beauty of the males’ tails is positional; peahens are attracted to the most ornate tail. But what underlies the mechanism is the relative unobserved genetic quality. When (male) human adolescents perform risky behaviors, they are moving themselves upwards in relative perceived status rankings by demonstrating greater underlying genetic quality. In this narrow context, signaling status and signaling underlying genetic quality are synonymous, as that is how the Handicap Principle is presumed to function. Human adolescents who are able to engage in risky behaviors and still “get away with it” (i.e., bear the physical or social costs of doing so where others are unable or unwilling) demonstrate they have better evolutionary fitness, and this is reflected sociologically with respect to higher status, just as in the case of drug use.

Engaging in risky strategies like substance abuse remains a part of the human psyche not by accident, but likely because it *works* as a credible signal. This rationalizes risky behaviors as acting in the background of our psychology (this mechanism also benefits by being less computationally demanding than is seen in other rationalizations of drug use, for example that of Becker and Murphy 1988). While many emotions and intuitions humanity evolved with no longer match the social environment of the modern world (Rubin 2003), it is not at all clear that engaging in risky behaviors is no longer a functional or even an efficient means of attaining status, especially amongst low status individuals.

Consuming poison, such as laundry detergent, without the pleasure promised by conventional substance abuse, in as public of a setting as possible, is the mechanism described above in play stripped to its very core. It only appears inane and irrational in the absence of recognizing the underlying reasons for adolescents engaging in

⁶ Murphy (2016) argues that it is possible to interpret some forms of status seeking as irrational should there arise a disconnect between what people believe they are doing and what is ultimately status seeking behavior. In those examples forms of status seeking took on a veneer of morality. This disconnect may also arise in the Ice Bucket Challenge. It does not seem to be in play in explaining the Tide Pod Challenge.

behaviors like substance abuse. If an adolescent wishes to attain notoriety and credibly signal, the signal must be precisely as stupid as gazelle slowing down in front of a predator. Given what is needed for the mechanism in question to function, the stupider the behavior (for instance, pretending a colorful capsule of laundry detergent is candy and eating it), the more credible the signal is. Prior to social media firms cracking down on the videos, they could very well earn the poison consumer the prestige of millions views on YouTube. Few other opportunities for that kind of celebrity (and concomitant increase in status) may be available for someone of presently low status.

Implications which follow are contingent on the accuracy of the preceding interpretation of the consumption of Tide Pods. As such, they may be a further step more speculative than the previous elaboration on Tide Pods and the Handicap Principle. These implications are also apart from the implied methodological question of the status of explanations like the Handicap Principle in the scope of the rational choice paradigm. Regardless, these points of analysis are direct extensions on the previous discussion, and therefore, worth fleshing out.

Namely, the preceding analysis says nothing about the social optimality of these practices. Status-seeking, as a rule, exposes others to a negative externality, since status itself is a positional good. It is possible simultaneously for the gains incurred through social media notoriety to be greater than the loss incurred through a visit to the emergency room with probability p , and for there also to be negative social consequences. The positional shifts net to zero, with only the visit to the emergency room with probability p remaining.⁷ Tullock's (1962) analysis is thereby extended to show that rent-seeking applies to tariffs, monopolies, theft, and Tide Pods.

The deadweight loss associated with tide pod consumption is measured simply by the injury caused by eating or attempting to eat one. Deadweight loss differs from the externality since the externality is the downward shift in status, and overall, shifts in status definitionally net to zero. Eating the tide pod, which is an act of rent seeking, is all that remains. Estimates of ratios of different classes of injuries to the value of a statistical human life can be found in Hoffer et al. (1998), which are inclusive of both internal and external costs of an injury.⁸ Next, per Valdez et al. (2014), 7.5% of exposures by children resulted in "moderate or major medical care," including one death out of 17,230 cases of children under six. Since these figures are for young children, they are likely high estimates for teenagers. Setting aside the risk of death and focusing on the 7.5% number, the cost of injury in terms of statistical lives is likely to the effect of "minor," meaning 0.002 statistical lives, for 92.5% of tide pods

⁷ There are some very small additional benefits that I have not mentioned, such as serving the function of sorting partners. However, this may not be a social good, as assortive mating is one cause of income inequality (Greenwood et al. 2014). Social benefits accrued are likely smaller than they are in education, for one example, which has received lengthy criticism elsewhere for imposing deadweight loss via a similar mechanism (Caplan 2018). There is a more speculative benefit to the Tide Pod Challenge, which is that it may on net *reduce* laundry detergent capsule poisonings. Despite a galling 215 cases of teens being hospitalized for consuming Tide Pods in the first 4 months of 2018, the overall pattern is a reduction in the number of children facing such treatment. It may be that the ironic outcome of the Tide Pod Challenge has been to raise awareness and actually create greater net social benefits than the Ice Bucket Challenge (which has received some criticism, see Belluz 2014). Somewhat less provocatively, Collins et al. (2015) argue that conspicuous consumption played a role in developing modern rates of economic growth.

⁸ See Boardman et al. (2006: 411) for a straightforward distillation of the results.

ingestions, and 7.5% is either “moderate” or “serious,” meaning 0.0155 or 0.0575 statistical lives, all per Hoffer et al. (1998). Under the assumption that the 7.5% of injuries are, for adolescents, far more likely to be “moderate” instead of “serious,” then the deadweight loss of each individual ingestion of a tide pod corresponds to 0.0030 statistical human lives. Using the estimate from Ioannidis et al. (2017, p. F250) of the statistical value of a human life,⁹ the deadweight loss is also associated with a loss of \$4,428. If this applies to all 215 cases of teenagers consuming Tide Pods in early 2018, this totals \$952,000 in deadweight loss.

But the greater danger with these social externalities is that if a large enough number of people begin eating Tide Pods, then there could be a social shift such that, instead of eating a Tide Pod to signal higher status, it could become necessary to eat a Tide Pod simply to avoid signaling *low* status. This may sound even more outrageous than what I have previously argued, but this is likely the equilibrium Western societies were in before significant governmental intervention took place discouraging tobacco use (as argued in Frank 2018). It isn’t clear that habitually breathing poison sticks several times a day is a stickier equilibrium than a social convention of once ritualistically trying to ingest laundry detergent.¹⁰ (The issue of whether or not there is now peer pressure amongst social media stars to film themselves eating Tide Pods was actually also discussed in the aforementioned video, “YOUTUBERS REACT TO TIDE POD CHALLENGE,” by FBE.) I should emphasize, however, that the danger any particular challenge may not emerge as a long-run equilibrium, as the recent past has suggested that they are largely faddish in nature.

In comparison to the Tide Pod Challenge, the Cinnamon Challenge and the Ice Bucket Challenge were far more widespread in practice. They remain licit on social media; on YouTube, the exact phrase “Cinnamon Challenge” returned over one million results, while the exact phrase “Ice Bucket Challenge” returned over four million results, both as of April, 2018. Of the two, the Ice Bucket Challenge may have been closer to achieving a pooling equilibrium with respect to social expectations, perhaps due to its superficially moral basis and its explicit encouragement of others to also take the challenge at the end of each video. I will also acknowledge that my argument is less forceful when it comes to the Cinnamon Challenge, since when presented with it many appear puzzled by the challenge and skeptical as to why it would be difficult.

Careful public policy analysis may also have reason for exerting caution when approaching the issue, if and when a similar and dangerous fad recurs. It is unlikely that society will ever succeed at stopping adolescents from engaging in risky behavior to signal status, and if attaining social media fame via eating laundry detergent is no longer an option, something else riskier may become a new one. According to the view from Redford (2017), entrepreneurs in the grey and black markets previously developed progressively riskier drugs in response to successive bans of drugs by the U.S. government. In the end, society may be not be safer with drugs banned but worse ones being innovated into existence for those who are willing to break the law, versus the safer but previously banned drugs simply being made legal. While the logic may not

⁹ This estimate is \$1.47 million, which the authors find after adjusting for publication bias.

¹⁰ In saying this, the model I have in mind is the Tide Pod Challenge as a “rite of passage” pooling equilibrium, as opposed to something done with any frequency.

work out exactly the same—in Redford’s model, the pleasure from drugs was sought, while here it is the risk itself—but it makes the issue difficult to interpret. This concern also applies to bans from social media platforms, so long as YouTube and Facebook are able to exert sufficient market power to ban Tide Pod videos without adolescents able to circumvent them, all while still maintaining a large enough audience to gain prestige.

4 Conclusion

The appropriate rational choice explanation of the Tide Pod Challenge is that adolescents, especially males, frequently seek risky activities as a means of attaining status. “Young adolescent males do something stupid” should not be surprising; “teen bites laundry detergent pod” is entirely a dog bites man story. It is wholly comprehensible using off-the-shelf social scientific theories, in this case a blend of conventional rational choice theory and evolutionary psychology, especially the Handicap Principle. The counterintuitive challenge is the distance from the conscious outlandishness of the behavior to the psychological mechanism itself. Yet if a decision must be conscious for a decision to be thought of as rational, it would draw into question whether a large swath of explanations found in rational choice theory properly belong there.

The Tide Pod Challenge functions as a credible means of signaling status precisely because it is so outwardly outrageous and risky. Those who choose to engage in the behavior did so at the points in their lives during which status has a very high weight in their utility functions, and engaging in risks like these is one mechanism, perhaps since time immemorial, by which adolescents have chosen to signal. Darwin’s Ghost guides adolescents to these behaviors, for which evolution has strongly indicated there exists a rational basis. Recognizing that this mechanism has *worked* should reduce our confidence in the efficacy of paternalistic lecturing against it, as should the fact that every cohort will have its own metaphorical Tide Pod Challenge. The reason why it should still be discouraged is that status as a positional good implies that all benefits accrued in performing the challenge are strictly at the expense of others. Corporate censorship of the challenge may ultimately have had positive social effects, but, if not the Tide Pod Challenge, adolescents will still find risky activities to take part in. The costs of that new activity may or may not be less costly than the Tide Pod Challenge.

References

- Abad-Santos, A. (2018). Why people are (mostly) joking about eating Tide Pods. *Vox*, <https://www.vox.com/2018/1/4/16841674/tide-pods-eating-meme-tide-pod-challenge>
- Alchian, A. (1950). Uncertainty, evolution, and economic theory. *Journal of Political Economy*, 58(3), 211–221.
- American Association of Poison Control Centers. (2018a). Laundry detergent packets (unit dose liquid) data. Retrieved October 4, 2018, from https://aapcc.s3.amazonaws.com/files/library/Laundry_Pack_Web_Data_through_3.2018.pdf.
- American Association of Poison Control Centers. (2018b). Intentional exposures among teens to single-load laundry packets. Retrieved October 4, 2018, from <http://www.aapcc.org/alerts/intentional-exposures-among-teens-single-load-laun/>. This page was deleted but has been archived: <https://web.archive.org/>

- web/20180430235815/, <http://www.aapcc.org/alerts/intentional-exposures-among-teens-single-load-laun/>
- Baker Jr, M. D., & Maner, J. K. (2008). Risk-taking as a situationally sensitive male mating strategy. *Evolution and Human Behavior*, 29, 391–395.
- Baker Jr, M. D., & Maner, J. K. (2009). Male risk-taking as a context-sensitive signaling device. *Journal of Experimental Social Psychology*, 45(5), 1136–1139.
- Basso, F., Robert-Demontrond, P., Hayek, M., Anton, J.-L., Nazarian, B., Roth, M., & Oullier, O. (2014). Why people drink shampoo? Food imitating products are fooling brains and endangering consumers for marketing purposes. *PLoS ONE*, 9(9), 1–17.
- Becker, G. (1962). Irrational behavior and economic theory. *Journal of Political Economy*, 70(1), 1–13.
- Becker, G., & Murphy, K. (1988). A theory of rational addiction. *Journal of Political Economy*, 96(4), 675–700.
- Belluz, J. (2014). The truth about the ice bucket challenge: Viral memes shouldn't dictate our charitable giving. *Vox*, <https://www.vox.com/2014/8/20/6040435/als-ice-bucket-challenge-and-why-we-give-to-charity-donate>
- Bever, L. (2018). Teens are daring each other to eat Tide Pods. We don't need to tell you that's a bad idea. *The Washington Post*, https://www.washingtonpost.com/news/to-your-health/wp/2018/01/13/teens-are-daring-each-other-to-eat-tide-pods-we-dont-need-to-tell-you-thats-a-bad-idea/?utm_term=.7dae3d8c8955
- Boardman, A. E., Greenberg, D. H., Vining, A. R., & Weimer, D. L. (2006). *Cost-benefit analysis: Concepts and practice* (3rd ed.). Upper Saddle River, NJ: Pearson Prentice Hall.
- Borkowska, B., & Pawlowski, B. (2014). Recreational drug use and fluctuating asymmetry: Testing the handicap principle. *Evolutionary Psychology*, 12(4), 769–782.
- Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin*, 125(3), 367–383.
- Caplan, Bryan. (2018). *The case against education: Why the education system is a waste of time and money*. Princeton: Princeton University Press.
- Collins, J. (2017). Rationalizing the 'irrational'. *Behavioral Scientist*, <http://behavioralscientist.org/rationalizing-the-irrational/>
- Collins, J., Baer, B., & Weber, E. J. (2015). Sexual selection, conspicuous consumption and economic growth. *Journal of Bioeconomics*, 17(2), 186–209.
- Consumer Reports News. (2013). As poisoning cases rise, a call for safer laundry pod packaging. <https://www.consumerreports.org/cro/news/2013/03/as-poisoning-cases-rise-a-call-for-safer-laundry-pod-packaging/index.htm>
- Dahir, I. (2018). Let's kick of 2018 with a warning from tide not to eat its laundry pacs. *Buzzfeed*, https://www.buzzfeed.com/ikrd/the-tide-pods-wont-get-you-high?utm_term=.vuZk6ZxeAK#.uvV1Q3KBgY
- De Fraja, G. (2009). The origins of utility: Sexual selection and conspicuous consumption. *Journal of Economic Behavior & Organization*, 72(1), 51–69.
- Diamond, Jared. (1992). *The third chimpanzee: The evolution and future of the human animal*. New York: HarperCollins.
- Durrant, Russell, Adamson, Simon, Todd, Fraser, & Selman, Doug. (2009). Drug use and addiction: Evolutionary perspective. *Australian and New Zealand Journal of Psychiatry*, 43(11), 1049–1056.
- Farthing, G. William. (2005). Attitudes toward heroic and nonheroic physical risk takers as mates and as friends. *Evolution and Human Behavior*, 26(2), 171–185.
- Frank, R. H. (2005). Departures from rational choice: With and without regret. In Francesco Parisi & Vernon L. Smith (Eds.), *The law and economics of irrational behavior*. Stanford: Stanford University Press.
- Frank, R. H. (2018). Why even tougher smoking regulations are justified. *The New York Times*, <https://www.nytimes.com/2018/01/05/business/economy/why-even-tougher-regulations-on-smoking-are-justified.html>
- Grant-Alferi, A., Schaechter, J., & Lipshultz, S. E. (2013). Ingesting and aspirating dry cinnamon by children and adolescents: the 'cinnamon challenge'. *Pediatrics*, 131(5), 833–835.
- Greenwood, J., Guner, N., Kocharkov, G., & Santos, C. (2014). Marry your like: Assortive mating and income inequality. *American Economic Review*, 105(4), 348–353.
- Greitemeyer, T., Kastemuller, A., & Fischer, P. (2013). Romantic motives and risk-taking: An evolutionary approach. *Journal of Risk Research*, 16(1), 19–38.

- Griskevicius, V., Tybur, J. M., Delton, A. W., & Robertson, T. E. (2011). The theory of mortality and socio-economic status on risk and delayed rewards: A life history theory approach. *Journal of Personality and Social Psychology*, *100*(6), 1015–1026.
- Gstalater, M. (2018). YouTube removing videos of people eating Tide Pods. *The Hill*, <http://thehill.com/policy/technology/369531-youtube-facebook-removing-videos-of-people-eating-tide-pods>
- Hagen, E. H., Roulette, C. J., & Sullivan, R. J. (2013). Explaining human recreational use of ‘pesticides’: The neurotoxin regulation model of substance use vs. the hijack model and implications for age and sex differences in drug consumption. *Frontiers in Psychiatry*, *4*(Article 142), 1–21.
- Hoffer, S., Berardino, F., Smith, J., & Rubin, S. (1998). *Economic values for evaluation of FAA investment and regulatory decisions*. Washington, DC: Federal Aviation Administration.
- Huntington, S., Heppner, J., Vohra, R., Mallois, R., & Geller, R. J. (2014). Serious adverse effects from single-use detergent sacs: Report from a U.S. Statewide Poison Control System. *Clinical Toxicology*, *52*, 220–225.
- Ioannidis, J. P. A., Stanley, T. D., & Doucouliagos, H. (2017). The power of bias in economics research. *The Economic Journal*, *127*(605), F236–F265.
- Karel, L. I., Handzel, M. C., & Rosini, J. M. (2015). Laundry detergent pod ingestion in 2 pediatric patients. *Journal of Emergency Nursing*, *41*(1), 80–82.
- Kavka, G. S. (1983). The toxin puzzle. *Analysis*, *43*(1), 33–36.
- Kelly, S., & Dunbar, R. I. M. (2001). Who dares, wins. *Human Nature*, *12*(2), 89–105.
- Kenrick, D. T., & Griskevicius, V. (2013). *The rational animal: How evolution made us smarter than we think*. New York: Basic Books.
- KnowYourMeme. (2018). Tide POD challenge.” <http://knowyourmeme.com/memes/tide-pod-challenge>
- Leeson, P. T. (2012). Ordeals. *Journal of Law and Economics*, *55*(3), 691–714.
- Leeson, P. T. (2017). *WTF?! An economic tour of the weird*. Stanford: Stanford University Press.
- Leeson, P. T., & Coyne, C. J. (2012). Sassywood. *Journal of Comparative Economics*, *40*, 608–620.
- Levitt, S. D., & Venkatesh, S. A. (2000). An economic analysis of a drug-selling gang’s finances. *Quarterly Journal of Economics*, *115*(3), 755–789.
- Murphy, R. H. (2016). The willingness-to-pay for caplanian irrationality. *Rationality and Society*, *28*(1), 52–82.
- Popper, K. (1959). *The logic of scientific discovery*. London: Hutchinson Co.
- Redford, A. (2017). Don’t eat the brown acid: Induced ‘malnovation’ in drug markets. *Review of Austrian Economics*, *30*(2), 215–233.
- Ridley, M. (1996). *The origins of virtue: human instincts and the evolution of cooperation*. New York: Penguin.
- Ronay, R., & von Hippel, W. (2010). The presence of an attractive woman elevates testosterone and physical risk taking in young men. *Social Psychological and Personality Science*, *1*(1), 57–64.
- Rubin, P. (2003). Folk economics. *Southern Economic Journal*, *70*(1), 157–171.
- Rubin, P., & Paul, C. W. (1979). An evolutionary model of taste for risk. *Economic Inquiry*, *17*(4), 585–596.
- Shanks, D. R., Vadillo, M. A., Riedel, B., Clymo, A., Govind, S., Hickin, N., Tamman, A. J. F., & Puhlmann, L. M. C. (2015). Romance, risk, and replication: can consumer choices and risk-taking be primed by mating motives? *Journal of Experimental Psychology: General*, *144*(6), e142–e158.
- Sjogren, P. P., Skarda, D. E., & Park, A. H. (2016). Upper aerodigestive injuries from detergent ingestion in children. *The Laryngoscope*, *127*(February), 509–512.
- Smith, E., Liebelt, E., & Nogueira, J. (2014). Laundry detergent pod ingestions: Is there a need for endoscopy? *Journal of Medical Toxicology*, *10*(3), 286–291.
- Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Development Review*, *28*(1), 78–106.
- Stigler, G., & Becker, G. (1977). De gustibus non est disputandum. *American Economic Review*, *67*(2), 76–90.
- Stromberg, P. E., Burt, M. H., Rose, S. R., Cumpston, K. L., Emswiler, M. P., & Wills, B. K. (2015). Airway compromise in children exposed to single-use laundry detergent pods: A poison center observational case series. *American Journal of Emergency Medicine*, *33*, 349–351.
- Sundie, J. M., Kenrick, D. T., Griskevicius, V., Tybur, J. M., Vohs, K. D., & Beal, D. J. (2010). Peacocks, porsches, and thorstein veblen: Conspicuous consumption as a sexual signaling system. *Journal of Personality and Social Psychology*, *100*(4), 664–680.
- Tullock, G. (1962). The welfare costs of tariffs, monopolies, and theft. *Economic Inquiry*, *5*(2), 224–232.

- Valdez, A. L., Casavant, M. J., Spiller, H. A., Chounthirath, T., Xiang, H., & Smith, G. A. (2014). Pediatric exposure to laundry pods. *Pediatrics*, *134*(6), 1127–1135.
- Veblen, T. (1899). *The theory of the leisure class*. Abingdon: Macmillan.
- Vincke, E. (2017). *The deep rationality of dark consumption: Alcohol and cigarette use as sexual signaling*. Dissertation, Ghent University.
- von Mises, L. (1949). *Human action*. New Haven: Yale University Press.
- Wilke, A., Hutchinson, J. M. C., Todd, P. M., & Kruger, D. J. (2006). Is risk taking used as a cue in mate choice? *Evolutionary Psychology*, *4*, 367–393.
- Wilson, M., & Daly, M. (1985). Competitiveness, risk taking, and violence: The young male syndrome. *Ethology and Sociobiology*, *6*(1), 59–73.
- Yin, S., Behrman, A., & Colvin, J. (2015). Laundry pack exposures in children 0-5 years evaluated at a single pediatric institution. *The Journal of Emergency Medicine*, *48*(5), 566–572.
- Zahavi, A. (1975). Mate selection—A selection for handicap. *Journal of Theoretical Biology*, *53*(1), 205–214.
- Zahavi, A., & Zahavi, A. (1997). *The handicap principle: A missing piece of Darwin's puzzle*. Oxford: Oxford University Press.

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