GENDER DIFFERENCES IN IMPULSIVITY WITH CANDY AND ALCOHOL:

A FUZZY TRACE THEORY APPROACH TO SOCIAL MEANING

IN RISKY HEALTH BEHAVIORS

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# ABSTRACT

Predictions of fuzzy-trace theory regarding impulsivity and reward sensitivity are investigated using temporal discounting tasks in health domains. Items in the task, alcohol and candy, are hypothesized to have meaningful connections to gender norms and identity. A sample of 1535 college undergraduates (68% female, mean age 19.92) participated in a pilot study and two experiments. In regressions to predict risk-taking, gist-based temporal discounting of gender-linked products interacted with gender to explain variance beyond that which is explained by sensation seeking, unlike traditional discount rates. This result is contrary to the predictions of a social norms hypothesis, that each gender would want more of the gender-linked product; they wanted more but chose less. Thus, participants were more impulsive with gender-linked products, suggesting that items that were meaningfully related to identity were more motivating, and thus reveal one's impulsivity in temporal discounting questions better than a stimulus that has no meaning.

## BIOGRAPHICAL SKETCH

Evan Wilhelms is currently a third year PhD student in Cornell University's Department of Human Development. He earned his B.S. in Psychology and Philosophy in 2004 from Baldwin-Wallace College in 2004. He grew up in Cleveland, OH and now resides in Ithaca, NY. His current research explores the relationships of behavioral economics and risk-taking.

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Approach to Social Meaning in Risky Health Behaviors

The topics of impulsivity and self-control have increasingly become a focus of

research in adolescents and adults, with both theoretical and practical relevance.

Theoretically, there is growing interest in understanding basic cognitive processes that

underlie decision making from adolescence to adulthood, as decision tasks often confound a

variety of processes and traits, including reward sensitivity, numeracy, memory, and risk-

taking.  Practically, self-control of impulsivity has been implicated in a variety of important

health outcomes, including sexual health, substance abuse, and obesity (Metcalfe & Mischel,

1999; Reyna & Farley, 2006; Weller, Cook, Avsar, & Cox, 2008).  In this sense, decisions

that require us to suppress impulsive desires—to avoid a delicious cheeseburger in favor of a

healthier salad—are risky choices that determine our future health and well being.  In this

literature, risky choices are often defined as behaviors that could lead to adverse outcomes

(Byrnes et al, 1999).  These choices on the part of individuals also determine the health of

populations, and thus understanding the processes that cause these decisions is imperative to

designing interventions to improve individual health.

For example, binge drinking has been linked to a variety of health problems, including

high blood pressure and neurological damage, as well as risks such as unintentional injuries

and sexually transmitted infections (Centers for Disease Control, 2012).  Binge drinking,

defined as having four or more drinks in one sitting for females or five or more for males, has

been estimated to cost a quarter of a trillion dollars in healthcare expenses as well as related

effects in crime and reduced productivity (Centers for Disease Control, 2009).  Thirty percent

of binge drinking episodes involves adults age 25 or younger.  Although binge drinking has

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been related to socioeconomic status (e.g., Huckle et al., 2010), males have also often been presumed to participate in risky behavior with greater frequency than females. This lay perspective has been corroborated by longitudinal evidence (Karlamangla et al., 2006), wherein it was found that males, non-married individuals, and those with less than a high-school education were more likely to binge drink (see also Byrnes et al, 1999).

Although the causes of gender disparity are not clearly known, differential neurological activation has been found in male and female binge drinkers compared to controls on memory tasks (Squeglia, Schweinsburg, Pulido, & Tapert, 2011). Specifically, when completing working memory tasks while undergoing functional magnetic resonance imaging, male adolescent binge drinkers showed greater activation in frontal, temporal, and cerebellar regions than did male controls, whereas female binge drinkers displayed less activation in those same regions. The authors suggest that adolescent males may be less vulnerable to the neurotoxic effects of binge drinking, leaving open the possibility for an argument for capacity (i.e., males drink more because they can). This need not be the only reason for the difference in drinking, however, and other factors may feed decision processes, including culture and gender stereotypes, which we investigate in the present study.

Similarly, choices about food can have lasting effects on the health of individuals and populations. Being overweight or obese puts people at greater risk for a variety of health problems, many of which are associated with increased morbidity, including heart disease, hypertension, dyslipidemia, and various metabolic syndromes such as Type II diabetes (Obesity in America, 2013). Nutrition habits are set early in childhood and adolescence, and currently a third of children ages 2-19 are categorized as either overweight or obese (American Heart Association, 2012). Efforts to encourage healthy eating, however, must face

complicating challenges, such as the influence of culture, peer and parental influence, socio-economic factors, as well as food information supplied by the media (Kortzinger, Neale, & Tilston, 1994). Furthermore, evidence has suggested that knowledge about healthy diet does not necessarily translate into whether children will actually make healthy choices of foods to eat (Joy-Telu & Malcolm, 2007). Recent work attempting to model the nutrition decisions of adolescents has emphasized the roles of perceived behavioral control as well as the influence of injunctive social norms (i.e., perceived norms about what one *should* do; Baker, Little, & Brownell, 2003). Specifically, it was found that intraself beliefs—beliefs that effort and ability can influence specific outcomes—were predictive of healthy dietary intentions, whereas extraself beliefs—beliefs that luck, parents, or teachers can influence specific outcomes—had a negative effect on dietary intentions (similar to the cognitive construct of locus of control; e.g. Wallston, Strudler Wallston, & DeVellis, 1978). Social norms also had a gendered influence on emotional reaction towards dietary decisions. Specifically, consuming certain comfort foods—including both unhealthy options like candy and chocolates as well as healthier casseroles and side dishes—resulted females feeling less healthy and more guilty than males, a tendency that has been attributed to restrictive dieting norms for females.

This perspective is incomplete, however, both in that there is weak evidence for social norms as a predictor of dietary intentions (Baker, Little, & Brownell, 2003). These social norms, both descriptive and injunctive, played a role in determining behavioral intentions about healthy eating only through their effect on attitudes. (Though there was a direct effect of descriptive social norms on behavioral intentions regarding physical activity, this effect only existed for males.) Moreover, social norms were found not to have an effect on

intentions to eat healthy once individual attitudes, perceived behavioral control, and perceived past behavior were controlled (Conner, Norman, & Bell, 2002). In addition, this perspective does not take into account intuitive elements that are found in mature decision making (Reyna & Farley, 2006).

Research based social norms has found evidence of their influence on alcohol consumption as well. For example, Perceived social norms about peers has been found to be one of the strongest predictors of college students' personal drinking behavior (Perkins, 2002). However, it is consistently found that college students overestimate the prevalence of problem drinking behaviors, even in environments in which such problems are already relatively high, thusly resulting in misperceptions of peer norms and a significant effect of exacerbating problem drinking. Additionally, college students consistently rate their own comfort level with alcohol norms as below that of their friends, resulting in a belief that their concerns are unique, and subsequent pressure to conform to the perceived norm (Dunning, Heath, & Suls, 2004). As a result, some intervention strategies have focused on the delivery of personalized normative feedback, which has been most effective when targeted toward those at higher risk (younger students, athletes, and Greek members) and when the feedback provided is specifically regarding proximal groups (Lewis & Neighbors, 2006). Similarly, gender played a role in the influence of social norms in that perceived social norms about one's own gender more strongly predicted problematic drinking than did gender-nonspecific norms (Lewis & Neighbors, 2004). Additionally, men tended to display problems with alcohol consumption that were more public, whereas women displayed problems that were more private (Perkins, 2002). This predictive effect of social norms is far from a complete story, and neither descriptive nor injunctive norms were significant predictors of alcohol problems once

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individuals' level of consumption was controlled (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Moreover, though these social norms were a predictor of alcohol consumption overall, the reasons for drinking were found to be a better predictor of problems as a result of this consumption.

It is worth noting that the social norms described here are entirely consistent with an associative model of cognitive processing, that individuals need not have any particular meaning or insight regarding the norms to react to them. Contrarily, fuzzy trace theory posits that it is the processing of the meaning of information that has the most influence over decisions and behavior in healthy adult reasoning. Thus, the present study investigates decision-making in these two aforementioned health domains (i.e., binge drinking and nutrition) in the context of a classic laboratory task—temporal discounting—as well as assesses relationships with real-world risk-taking outcomes. In doing so, we investigate specific hypotheses of fuzzy trace theory regarding the predictive power of tasks that rely on compensatory weighing of risks and benefits compared to those that emphasize intuitive, meaningful understanding of delay decisions.

**Theoretical Background**

Fuzzy trace theory is a comprehensive theory of memory, reasoning, judgment, and decision-making, is grounded in scientific evidence about how people represent, retrieve and process information, with specific attention to how these processes develop with age and expertise (Reyna & Brainerd, 2011). According to this theory, impulsive reactivity that accompanies a dopaminergic response (as might accompany food or alcohol) as well as deliberative, analytic reasoning are both distinct routes to risk-taking and unhealthy behavior Reyna & Farley, 2006). Moreover, adults tend to rely less on the latter—deliberative, analytic

reasoning—and instead favor intuition in the form of bottom-line, gist-based representations. Fuzzy trace theory incorporates the social elements that characterize standard theories of decision-making, including the theory of planned behavior, in that social factors such as peer approval may be considered in the deliberative trade-off of risk and reward. It is also important to note that, contrary to standard models of risk-taking, intuition is a separate concept from impulsivity (Reyna, in press). Intuition is defined in fuzzy trace theory as impressionistic thinking using vague, gist representations of bottom-line understanding or meaning, whereas impulsivity refers to behavior that is a result of lack of self-control (Reyna & Farley, 2006).

Information is encoded, according to fuzzy trace theory, according to a hierarchy of gist representations along with verbatim representations. Verbatim representations are the encoding of surface details, including numerical information, precise wording, and memories for the source of information, and these representations support deliberative, analytical reasoning. Gist representations, supporting intuition, are the encoding of bottom-line meanings, including patterns, themes, and inferences. These representations are encoded independently and in parallel (Reyna & Kiernan, 1994). Processing of both gist and verbatim representations improves with age. In the domain of risky decision making, however, verbatim processing tends to reach maturity in adolescence, whereas gist processing becomes fully mature in adulthood and tends to be relied on more by adults. These developmental differences have been corroborated both in laboratory tasks and in real-world risk-taking, and have predicted many paradoxical effects that people may respond in contradictory ways when asked questions about memories for the same information (Reyna & Ellis, 1994; Mills, Reyna, & Estrada, 2008; Reyna et al., 2011). For example, it can be seen as counterintuitive

that questions that ask for specific quantitative risk estimates are positively correlated with risk-taking outcomes, although questions that ask for global or categorical risk estimates are negatively correlated with risk outcomes (Mills, Reyna, & Estrada, 2008). This surprising relationship is predicted and explained by fuzzy trace theory, given that specific quantitative risk questions evoke specific verbatim memories of participating in risky activities, whereas the global questions elicit responses that are based on gist representations and generate positive associations when subjects think about risk in gist-based or categorical terms.

**Fuzzy trace theory's incorporation of previous approaches to impulsivity**. Most standard developmental approaches to cognition and unhealthy risk-taking account for an increase in adolescents' unhealthy behaviors through differences in sensation seeking, self-control, and impulsivity (Wilhelms & Reyna, 2013). Given that basic rules of probability and logic are understood at an early age (Reyna & Brainerd, 1994), standard approaches conclude that the reasoning and information processing of adolescents and adults are equivalent (Steinberg, 2008). Thus, according to such approaches, adolescents' reasoning is of equivalent capacity to adults, although differences in decisions are explained by emotionality, lack of self-control, or lack of planning or focus on the future. Neurological evidence provides support for these differences in adolescent reasoning, including the development of dopaminergic arousal mechanisms related to emotion and reward processing that occurs during adolescence, as well as the development of cortical control mechanisms that are associated with increases in self-control and delay of gratification; the latter of these changes are not complete until adulthood (Reyna, Chapman, Dougherty, & Confrey, 2012; Somerville, Jones, & Casey, 2010).

This first category of neurological change related to adolescent reasoning reflects an increase in reward sensitivity associated with the individual difference referred to as sensation seeking. Sensation seeking is defined as "a need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences" (Zuckerman, 1979, p. 11), and appears to peak in adolescence (Steinberg et al., 2008). This curvilinear relationship reflects underlying neurobiological changes that occur in adolescents, including an increase in activation in the nucleus accumbens in response to manipulated reward values, as well as an increase in dopaminergic innervation of the prefrontal cortex (Galvan et al, 2006, Rosenberg & Lewis, 1995). This is assumed to have an effect of making the experience or anticipation of rewarding stimuli to be more rewarding—though developmental differences in brain structure or function depend on task features or other experimental contexts (e.g., Bjork, Lynne-Landsman, Sirocco, & Boyce, 2012)—which can result in unhealthy decisions if benefits of risk-taking are salient. This effect is in conjunction with other neurobiological changes that affect networks that are relied on for encoding of emotional and social information (Nelson, Leibenluft, McClure, & Pine, 2005). This leads to situations in which social acceptance from peers can be processed by adolescence is ways similar to other sorts of nonsocial rewards (Steinberg, 2008).

Fuzzy trace theory takes a nuanced approach to incorporate the salience of social rewards in reasoning (Rivers, Reyna & Mills, 2008). In particular, the emotional valence of social information and cultural stereotypes are often incorporated into gist representations. Fuzzy trace theory incorporates the standard view that "hot" stimuli and rewards are a distraction from deliberative analysis by also asserting that emotional arousal can interfere with verbatim processing more than gist processing. However, the emotional elements that

are considered to be among hot stimuli can often be a basic feature of gist representations, particularly evaluations of emotional valence, whether emotional content is positive or negative. Additionally, gist representations can incorporate subjective interpretations based on education, culture, experience, and worldview, which can include stereotypes about gender roles and social rewards based on those roles (Reyna & Brainerd, 2011). Since gists are more likely to be relied on in making decisions, the encoding of these cultural stereotypes may be critical in determining health behaviors. As previously mentioned, this effect can be amplified when adolescents must make health decisions in emotionally charged (i.e., "hot") contexts, including those in which desire for reward stimuli (such as alcohol and food) must be controlled or inhibited.

**Self-control and temporal discounting.** As previously mentioned, the neurobiological changes associated with self-control and delay of gratification are not complete until adulthood. The opposite tendency—to weigh delayed rewards with less subjective value than immediate rewards—is called temporal discounting, and is a stable individual difference in adults (Kirby, 2009). Temporal discounting rates are usually assessed by administering a series of delay-decision tasks in which subjects select between an immediate reward and a delayed, larger reward (e.g., "Would you rather have $18 now or $30 in two months?"). Through aggregating and modeling these choices using a hyperbolic function based on the reward amounts and delay duration, an indifference point can be calculated for each subject; this is the point at which a certain proportion of a larger delayed reward induces indifference between the two options; this proportion is the discount rate. The most notable developmental pattern associated with this trait, however, is a systematic decrease in temporal discount rates from childhood to old age (Green, Fry, & Myerson, 1994).

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Specifically, there is a drop in discount rates that occurs between the ages of 20 and 30 before remaining relatively stable (Green, Myerson, Lichtman, Rosen, & Fry, 1996). This is consistent with the interpretation that the age-related change in temporal discounting rates reflects a decrease in impulsivity, given that high rates of discounting indicate preference for more immediate rewards, even if these rewards are smaller than the delayed option. Importantly, heightened rates of temporal discounting—like those found in adolescents overall—have been associated with lower educational attainment (Metcalfe & Mischel, 1999), as well as outcomes related to poor health (Melanko & Larkin, 2013). For example, a study comparing a sample of obese men and women on temporal discounting tasks to a matched sample of healthy-weight men and women found that the obese women displayed higher temporal discounting rates than did the healthy women (the effect was not observed in men; Weller, Cook, Avsar, & Cox, 2008). Recent work has implicated prefrontal cortex activity in those who discount highly that is differentially activated for tasks in which action must be inhibited, whereas those with lower discount rates (i.e., high self-control or patience) show greater ventral striatum activity (Casey et al., 2011). This was found in a study in which subjects—who had participated in a delay-of-gratification experiment 40 years prior as children—participated in an emotional go/no-go task in which they had to inhibit a behavioral response based on the emotional content of faces that were presented to them, either fearful or happy, while undergoing function imaging. Not only did the individuals who demonstrated low self-control as children also perform more poorly on the task than those who demonstrated higher self-control, but those who demonstrated low self-control had increased striatum activity compared to those with high self-control, and those with high self-control demonstrated increased prefrontal cortex activity in comparison.

It is important to note, however, that temporal discounting and impulsivity are distinct from any risk preference such as preferring risky options in decision tasks. In a study that assessed differences in delay discount rates between gamblers and non-gamblers, and compared these discount rates to an equivalent rate of discounting of probabilistic (risky) non-delayed rewards, both gamblers and non-gamblers displayed similar hyperbolic rates of delay discounting, and both groups also demonstrated a reduction of discounting (i.e., more patience) for high magnitude delayed rewards (Holt, Green, & Myerson, 2003). An expected pattern was displayed for probabilistic rewards, however, in that gamblers discounted probabilistic rewards more steeply than non-gamblers. The authors argue that this evidence contradicts the idea that risk-taking and impulsivity are reducible to one another, and that temporal discounting and probabilistic risk preferences are independent, as the gamblers seem to be just as patient for delayed rewards as non-gamblers, although they find more value in the risky rewards.

In investigating the interaction of intuitive processes (i.e., gist) and sensation seeking using temporal discounting tasks in health domains such as alcohol use and food choices to predict real-world risk-taking, the present study tests the hypothesis that qualitative distinctions in choice options tend to have the greatest influence on decisions. In these temporal discounting tasks, this qualitative distinction or gist is the choice between a smaller reward now compared to a larger reward later. We compare measures of temporal discounting that directly assess this gist-based distinction to traditional measures to evaluate whether measures based on intuitive gists have equivalent or greater predictive validity than those that rely on verbatim processing such as quantitative processing. Although temporal discounting tasks are encoded both as verbatim details (e.g., $18 now vs. $30 in 60 days) and

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as bottom-line gists (e.g., some money now or more later), individuals retrieve the simplest relevant gists necessary to make a decision. Thus, the underlying gist of delay decisions would have more predictive validity for unhealthy outcomes than detailed, elaborate, and mathematical processing, as this underlying gist regarding immediate vs. delayed rewards is more likely to be extended and relevant to other decisions about risks. We also evaluate whether the gists that are used in making decisions relating to alcohol and food can offer any insight into the gender-linked effects previously discussed. To inform our predictions about the relationship between these products, alcohol and candy, and gender roles, we conduct a pilot study to assess whether gender stereotypes may exist that would contribute to culturally shared gists about men, women, candy, and alcohol, that would subsequently be used to inform delay discounting choices. We then conducted two experiments that test the capacity for discounting measures based on gist to predict risk-taking in both men and women. These experiments also compare these gist-based discounting measures to standard measures of temporal discounting, as well as compare the differential predictive ability of gist-based discounting measures for specific gender-stereotyped products to predict risk-taking.

**Pilot Study**

**Method**

Participants were 273 college undergrads who participated in an online survey study for extra credit in introductory psychology courses. Subjects had a mean age of 19.49 and were 71% female. The sample was 63% White, 27% Asian, 5% Black, and 5% identifying as mixed or other. 11% identified as Hispanic.

The purpose of the pilot study was to identify stereotypes about the stimuli in our testing materials (candy and alcohol) as they relate to both men and women, and test the

predictions that candy would be more strongly linked to female gender identity and that

alcohol would be more strongly linked to male gender identity.  To assess these stereotypes,

we used an indirect questioning method that asks what typical others would think about the

subject (Fisher, 1993).  Specifically, all participants were asked the question, "What do most

people think of when they think of women and candy?" as well as fully crossed versions of

the question as they pertain to men and alcohol.  Order of these four questions was

counterbalanced on the survey.  Additionally, each participant was asked the following

questions:  "What would a woman want more (i.e., have a greater desire for)?"  "Which

would a woman want more OF (i.e., number of servings)?" and "Which of these is more

closely linked to a woman's identity?" as well as the same questions about men's preferences

and identity.  For each of these questions, participants could select among four options: candy,

alcohol, neither, or "other," the last of which included the opportunity to write in another

option.  Order of this section was also counterbalanced between questions about men and

women.  Subjects finally completed a demographics questionnaire.

**Results**

Participants' responses to categorical questions regarding men and women's

preferences are summarized in Table 1.  Overall, majorities of the participants endorsed that

the product that was hypothesized to have a gender-linked meaning was preferred by the

hypothesized gender.  That is, consistently over 80% of respondents endorsed that men would

want alcohol more than candy, they would want more alcohol than they would want candy or

other products, and that alcohol is more closely linked to a man's identity than candy or other

products.  This effect was only somewhat more equivocal regarding women, in that majorities

selected the hypothesized gender-linked product, although smaller majorities than for men.

Specifically, majorities selected that women would want candy over alcohol or other products, that women would want more candy than alcohol or other products, and that candy is more closely linked to a woman's identity. "Neither" was a more popular option when responding about women than about men. Insight into those who selected both "neither" or "other" could be found in the write-in responses; among the write-in responses for women were "clothes," "flowers," "salad," and specifically naming "chocolate." Although responses regarding males were more consistent (as participants preferred to link males with alcohol), the few who selected "other" regarding males wrote in responses such as "meat" and "sex." Overall, the majorities selected responses that supported the predictions that alcohol and candy were both linked to gender stereotypes, although alcohol is more clearly related to male stereotypes than candy is.

Considering the gender of the respondent also lends insight into the evaluation of response options for these categorical questions, and the percentages selecting each response option for these questions split by gender can be found in Table 1. Both male and female respondents appear to agree that men prefer alcohol (as assessed by what they'd want more, want more of, and would be more closely linked to their identity), as majorities of both men and women over 80% prefer alcohol as a response to all three questions about males. However, female respondents select that women would prefer candy at a greater rate than men do. The same pattern was exhibited for the remaining two questions, although with smaller differences between the response rates from males and females. This qualification supports the hypothesized link between candy and female gender stereotypes, and it suggests that this link may be more readily elicited in females themselves.

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Qualitative responses were evaluated by categorizing responses according to their consistent themes. For stereotypes involving females and candy the largest category of responses involved some sort of concern about weight gain (24.4%), such as "They think of fat women eating candy," or "Women fretting about eating too much sugar, etc." The next largest groups of responses involved statements making a general connection (13.3%; e.g., "women very much enjoy it"), statements made regarding emotional comfort (12.2%; e.g., "They eat it when they're sad" or "Women indulge in candy when emotional"), and statements specifically mentioning chocolate as a preferred form of candy (10.4%). Statements that made connections regarding menstruation or PMS represented only 8.2% of responses, and statements that made connections regarding candy's use as a romantic gift was also 8.2% of responses; all other responses were either mixed or fell into categories that made up less than 5% of responses. Altogether the responses indicate that connections are stereotypically made between females and candy (specifically chocolate), and that these connections are usually associated with a balance between dietary concerns and a strong emotional impulse associated with the candy.

This pattern demonstrating detail in responses about females and candy was not found nearly as clearly in responses about males. In fact, the largest category was among those who indicated there was no connection between males and candy (20.8%), followed by those who only stated a general connection (15.4%; e.g., "It seems like a normal combination of things"). A few groups of statements involved detail to the connection, including a category that is the mirrored opposite of women's dietary concerns (12.2%, e.g. "the ability to eat anything you want without worrying about weight") as well as statements that reflected those same concerns (11.5%, e.g. "Men who like candy like sweet stuff and are prone to being

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fat."). There was also a small category of responses (9.7%) that related men to candy through the romantic relationship with women, for example, "men giving women chocolate." All other responses were either mixed or fell into categories that made up less than 5% of responses. The general pattern through the responses to this question were that people can come up with connections between men and candy, but seem to need to search more to give the connection any detail, whereas many reject that there is any connection.

Participants were generally able to make stereotypic connections between alcohol and both males and females. Regarding males, the largest category of responses included those that referenced social events (e.g., "hanging out with their friends, watching a sports game"), which composed 18.3% of responses. Other categories of responses included those that described a belligerent response to alcohol consumption (16.5%; e.g. "violence," or "loud, cocky, aggressive"), those that made a general connection (15.8%, e.g. "defining masculinity," or "men like to drink a lot"), those that cite specific long-term negative consequences (15.4%, e.g., "alcoholism," or "beer bellies"), and those that specifically cite college fraternities (13.3%; e.g., "Fraternity parties or bar settings"). All other responses were either mixed or fell into categories that made up less than 5% of responses. Altogether participants' stereotypes are those in which alcohol is strongly tied to social rewards in males and often result negative consequences from overindulgence.

Participants were also able to produce stereotypes that linked females to alcohol consumption. The largest category of responses pertained to sex and promiscuity (e.g., "one night stands" or "sluttiness") consisting of 22.8% of responses. An additional category mirrored responses regarding males and alcohol, referencing social events and groups (19.7%, e.g., "sorority girls," "partying"). Other groups of responses included those that refer to the

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kind of alcoholic drinks females tend to drink, often mentioning lower alcohol tolerance as a cause (17.6%, e.g. "Fruity drinks, hard alcohol, bars, lightweight"), and those that refer to males taking advantage of lowered inhibition (9.3%, e.g., "date rape, forcible touching"). All other responses were either mixed or fell into categories that made up less than 5% of responses. Thus, stereotypes given regarding women and alcohol tended to demonstrate detailed connections, often including the social rewards, but also referencing greater negative consequences and lower overall magnitudes of consumption.

In sum, this pilot study revealed that alcohol is more closely tied to male stereotypes and candy is more closely tied to female stereotypes. This was revealed through quantitative endorsements and through qualitative descriptions. The endorsements show that candy has almost no link to male stereotypes and identity though it is clearly linked to females'. Alcohol, however, is more closely linked to male identity. Greater detail regarding this connection was given in the qualitative data, in which candy is of high emotional reward value to females but not at all to males, though alcohol has a social reward value to both males and females but can pose more negative consequences for females.

## Experiment 1

**Method**

**Participants.** Participants were mostly undergraduates who were offered extra credit in introductory courses for participation in the study. A total of 869 subjects participated in the study, 284 males and 583 females (two did not report their gender). The average age of participants was 20.25 with a standard deviation of 3.444. The total range of ages of participants was from 18-77, although 98% of the participants were under 24.

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**Design, Materials, and Procedure.** Each of the four surveys was organized with a 2X2X4 within-subject design of temporal discounting questions. Questions took the form of "Which would you choose: 1 candy bar right now, or getting 1 and a half candy bars in a month?" These questions varied across the following three factors: the product at risk (either candy or alcohol), the magnitude of the smaller-sooner option (either one or six), and four different delayed options. Following each block of temporal discounting questions, participants were asked to select one of five gist options that could describe any consistency to their answers in the preceding section. Participants could select: "Now is always better than later," "Now is mostly better than later," "Later is always better than now," "Later is mostly better than now," "The amount of waiting time and the number of drinks both matter."

In addition to the experimental portion of the study, subjects were asked to report their age, gender and ethnicity, as well as their height and weight. They were asked to rank their hunger and thirst at the moment on a ten-point scale and were asked if they do not consume alcohol at all. Furthermore, each participant was evaluated across a variety of individual difference scales.

The Brief Sensation Seeking Scale (BSSS) devised by Hoyle et al. (2002) contains eight items that reflect disposition and attitude toward risk. The scale is an adaptation of the SSS-V (Zuckerman et al., 1978) tailored to adolescents, although it maintains the original four dimensions from the SSS-V. The four subscales in the BSSS include experience seeking (e.g., "I would like to explore strange places," and "I would like to take off on a trip with no pre-planned routes or timetables"), boredom susceptibility (e.g., "I get restless when I spend too much time at home," and "I prefer friends who are excitingly unpredictable"), thrill and adventure seeking (e.g., "I like to do frightening things," and "I would like to try bungee

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jumping"), and disinhibition (e.g., "I like wild parties," and "I would love to have new and exciting experiences, even if they are illegal").  Items were ranked on a five-point scale from "strongly disagree" to "strongly agree."

The Adolescent Risk Questionnaire (ARQ) was designed to be a comprehensive measure of participation in risky behaviors (Gullone, Moore, Moss & Boyd, 2000).  Factor analysis conducted by Gullone et al. reveals four factors that emerge from the 22 items in the scale.  "Thrill-seeking behaviors," the first factor, included items such as parachuting and flying a plane.  The second factor, "rebellious behaviors," included underage drinking, taking drugs, and staying out late, among others.  The third factor, which included items such as drinking and driving and having unprotected sex, was characterized as "reckless behaviors," and the final factor, "antisocial behaviors," included items such as cheating, overeating, and teasing and picking on people.  The 22 items on the scale were rated on a five-point scale according to how often the participant has done the activity (i.e., never, hardly never, sometimes, often, very often).

The Alcohol Use Disorders Identification Test (AUDIT) is the World Health Organization's screening method to identify harmful habits of alcohol consumption as well as alcohol dependence (Babor, Higgins-Biddle, Saunders & Monteiro, 2001).  The AUDIT is a ten-item test with three subgroups of questions, each subgroup pertaining to the frequency of hazardous alcohol use, dependence symptoms, or the harmful effects of alcohol use.  In addition to the ten original AUDIT questions, one question—"How often do you have six or more drinks on one occasion?"—was included with two modified versions, each inquiring about the frequency of consuming five or four drinks on one occasion.  This was included to identify binge drinkers according to the definition introduced by the National Institute on

Alcohol Abuse and Alcoholism (NIAAA, 2004), which is specifically "consuming five or more drinks for men, or four or more drinks for women, in about 2 hours" (Monti, Tevyaw, & Borsari, n.d.). In accordance with this definition, it was also indicated in these questions that "one occasion" is defined as "about two hours." Also, for these three questions (those inquiring about four, five, and six drinks on one occasion), an additional response item— "twice a month"—was included along with the response options already designated by the World Health Organization. This was included to identify the specific habit of binge drinking according to the NIAAA's definition of "having had two or more binge-drinking episodes in the past month" (Monti, Tevyaw, & Borsari, n.d.).

The Cognitive Reflection Test (CRT) is a three-question test in which each item is designed to induce a response of an intuitive, although incorrect answer (Frederick, 2005). For example, when asked, "A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?" the most frequent incorrect answer is "ten cents," and it has been deducted from "verbal reports and scribbles in the margin" (Frederick, 2005, p. 27) that those who did answer correctly (i.e., "five cents") considered the intuitive, incorrect response first. Having been devised under a standard dual-process framework, it was posited that the intuitive, incorrect response is a result of the "System 1" process, which does not require much attention and tends to occur instantly. Conversely, obtaining the correct response requires "System 2" processing, which requires the execution of learned rules through concentration and effort. More recent work has suggested that this measure is more complex, and confounds processes such as verbatim matching, and metacognitive monitoring, as well as the originally proposed reflection and deliberation (Liberali, Reyna,

Furlan, Stein, & Pardo, 2011). These three questions were given with an indication that they may vary in difficulty, and participants could freely give any answer.

A new scale was created to assess behaviors and attitudes about financial risk. Some example items include, "I cannot seem to save money," "I borrow money to buy things I enjoy," and "I never borrow money." The entire twelve-item scale is available in the appendix. Items were ranked on a five-point scale from "strongly disagree" to "strongly agree."

**Data Analysis.** Temporal discount rates were calculated for each participant. Each participant was presented with a total of sixteen temporal discounting questions, each of which falls into a context of one of two products (candy and alcohol) and one of two starting magnitudes (one or six). As a result, four discount rates were calculated for each individual based on the four specific contexts. Because the amount of time delayed in each question was held constant at one month, a simple linear rate was calculated for each context. The point of indifference is expressed as a range, as each context included only four discounting questions from which to assess the specific point.

In addition, Body Mass Index (BMI) was calculated from participants' height and weight, using the standard Imperial BMI formula (Gallagher et al., 1996).

**Results**

The single gist items appear to be roughly normally distributed if interpreted as an ordinal scale, with "The amount of waiting time and the number of drinks both matter" (the verbatim option) placed as a middle option on the scale rather than at an end, which correlated with other measures (as described below). These single gist items were thus treated as ordinal scales for theoretical reasons with the verbatim option in the middle for subsequent analyses.

Histograms of these gist scales are visible in Figure 1, and appear to be roughly normal distributions.

To initially assess the relationship between discounting constructs (either calculated discount rates or the single gist item) and risky outcomes, spearman rho correlations were obtained between each discounting predictor and risk scale, including all subscales. Since it is predicted that this relationship depends on one's gender, each calculation was performed for the samples of males and females individually. These correlations are summarized in Table 2.

A general pattern emerged that the relationship between discounting and risky outcomes was stronger for males when the product being discounted was alcohol, and similarly, that the relationship between discounting and risky outcomes was stronger for females when the product in question was candy. This pattern was particularly apparent for the relationships with the ARQ, for which males' discount rates for alcohol significantly predicted ARQ score ($\varrho(252) = .16, p = .011$) although females' discount rates for candy significantly predicted the same ($\varrho(533) = .12, p = .011$). Neither the alcohol discount rate among females nor the candy discount rate among males was a significant predictor of ARQ. The pattern was replicated using the single gist item as a predictor, as the alcohol gist item significantly predicted ARQ among males ($\varrho(280) = .14, p = .023$), and the candy gist item significantly predicted ARQ among females ($\varrho(869) = .12, p = .005$). Again, neither the alcohol gist item for females nor the candy gist item for males was a significant predictor of ARQ.

It should be noted that among the ARQ subscales, stronger relationships were found between the discounting predictors and the rebellion subscale—containing items such as

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"underage drinking" and "getting drunk"—than were found using just the mean ARQ score. A comparable pattern was found in the strength of these correlations. Specifically, the discount rate for alcohol was significantly predictive of the rebellion subscale of the ARQ in males ($\varrho(252) = .20, p = .001$) and the discount rate for candy was significantly predictive of the rebellion subscale in females ($\varrho(533) = .15, p = .001$). In this case the relationships that would run contrary to the pattern are in fact significant, but with a smaller effect size; the discount rate for alcohol predicted the rebellion subscale in women ($\varrho(491) = .11, p = .011$) and the discount rate for candy predicted the rebellion subscale in men ($\varrho(264) = .12, p = .048$). The pattern was not as clear when using the single gist item as a predictor, although the effect sizes in predicting the rebellion subscale were still greater than the mean scale. While the alcohol gist item significantly predicted the rebellion subscale among males ($\varrho(280) = .18, p = .003$) and the candy gist item significantly predicted rebellion subscale among females ($\varrho(583) = .13, p = .002$), the candy gist item also significantly predicted the rebellion subscale among males ($\varrho(284) = .14, p = .016$).

The aforementioned pattern—that alcohol discount rates held more predictive power for males and candy discount rates held more predictive power for females—was also found in predicting risk-taking with alcohol as measured by the AUDIT. The discount rate for alcohol predicted the AUDIT in men ($\varrho(252) = .15, p = .018$) and the discount rate for candy predicted the AUDIT in women ($\varrho(533) = .10, p = .022$). Although some relationships that run contrary to this pattern were found to be significant among the subscales, it was consistently the case that using alcohol in discounting questions resulted in a greater predictive effect for males, and using candy resulted in a greater effect for females.

A consistent pattern was also found in predicting risk-taking with money as measured by the spendthrift scale. The discount rate for alcohol was significantly predictive of males' spendthrift scores ($\varrho(252) = .24, p < .001$) with a stronger effect than the discount rate for candy ($\varrho(264) = .18, p = .003$), and the discount rate for candy was significantly predictive of females' spendthrift scores ($\varrho(533) = .13, p = .003$), while the discount rate for alcohol was an insignificant predictor. The single gist item displayed the same pattern. The alcohol gist was significantly predictive of males' spendthrift scores ($\varrho(280) = .17, p = .005$) with a stronger effect than the candy gist ($\varrho(284) = .16, p = .007$), and the candy gist was significantly predictive of females' spendthrift scores ($\varrho(583) = .15, p < .001$), which was a stronger effect than the alcohol gist ($\varrho(580) = .08, p = .032$).

As this pattern was most clearly depicted in predicting ARQ, linear regressions were constructed to test whether this pattern of effects—an interaction between gender and discounting—could explain variation in risk-taking as measured by the ARQ beyond that which is explained by mere sensation seeking. These regressions are summarized in Table 3. The first model ($R^2 = .311$) contained BSSS, gender, and both discount rates as main effects, as well as two interaction terms, one for each discount rate by gender. In this first model, only the alcohol discount rate was found to explain variance ($\beta = .269, t(743) = 2.02, p = .044$) in the ARQ score that is unique from that which is explained by the BSSS ($\beta = .539, t(743) = 16.736, p < .001$). The second model ($R^2 = .303$) was constructed to parallel the first, but replacing the discount rates for both candy and alcohol with the gists for candy and alcohol, both in the main effects and in the interaction. In this second model, each of the gist terms as well as each interaction with gender was found to explain unique variance in ARQ score. Greater discounting, as measured by both of the two single gist items, was found to be

predictive of greater risk-taking as main effects. The interaction for each was found to replicate the pattern found in the bivariate correlations, that for males the predictive effect of the alcohol gist is increased, whereas for females the predictive effect of the candy gist is increased. This interaction is illustrated in Figure 2.

## Experiment 2

**Method**

**Participants.** The participants in Experiment 2 were likewise undergraduate students who enrolled in exchange for course credit. 393 subjects participated, 114 of whom were male and 278 were female (one did not report gender). The average age was 19.5 (SD=3.551).

**Design, Materials, and Procedure.** Experiment 2 largely resembles Experiment 1 in design, materials, and procedure. Framing and temporal discounting questions were organized into a 3x3x2x2x2 within subject design, with the "product at risk" factor containing the additional level of *money* added to the original *candy* and *alcohol*.

In addition to this modified design, subjects in this experiment also completed the Monetary Choice Questionnaire (Kirby, 1999). This questionnaire contains 27 delay discounting questions expressed in the form, "Would you prefer (a) $34 today or (b) $35 in 186 days?" The questions varied in the amount offered today, the amount offered after a delay, and the length of the delay. From these questions a hyperbolic discount rate was calculated, and such rates have been found to be stable over one year.

Otherwise, the materials and procedure in Experiment 2 replicates that of Experiment 1.

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**Results**

The regression analyses from Experiment 1 were replicated with the additional variables involving money. For the first two models, this resulted in a total of eight regressor terms: sensation seeking (BSSS), gender, the discounting term for each of three products (alcohol, candy and money) and an interaction term between gender and each of the three discounting terms. The results from these regressions are summarized in table 4. The first model ($R^2 = .383$) used the standard discount rates as discounting terms, and no regressor explained significant variance beyond that which was explained merely by sensation seeking. The second model ($R^2 = .294$) replaced the discount rate terms with the gists for each product, in both the main effects and the interaction (as in Experiment 1). This model found that the gist for money ($\beta = .417$, $t(391) = 2.42$, $p = .016$), as well as the interaction with gender ($\beta = -.392$, $t(391) = -2.16$, $p = .031$), were both significant predictors. The direction of the interaction indicates that the gist of money has a greater effect on risk-taking in males.

The final model ($R^2 = .276$) replaced the discounting terms in the previous models with the MCQ. Since this questionnaire evaluates only one product (money), the model was simplified to only contain the single discounting item and its interaction with gender. In this final model, the MCQ ($\beta = .356$, $t(392) = 2.29$, $p = .023$) and interaction with gender ($\beta = -.337$, $t(392) = -2.16$, $p = .031$) again predicted significant variance beyond that which was predicted merely by sensation seeking ($\beta = .497$, $t(392) = 11.36$, $p < .001$). Analogous to the second model, the direction of the interaction indicates that the MCQ has a greater effect on risk-taking in males.

**Conclusions**

Consistent across two experiments, temporal discounting items were predictive of risky behavior. This predictive effect interacted with gender, such that discounting for certain consumable products that were explicitly predicted to be linked to gender identity was predictive of risk-taking. Specifically, discounting of alcohol was predictive of risk taking for males and discounting of candy was predictive of risk taking for females. This effect was not limited to the domain of the consumable, discounted items in the task; discounting of alcohol did not merely predict risk-taking with alcohol, for example. Instead, discount rates were predictive of a wide array of risk domains that were measured by the ARQ, including illegal activities, drug use, and alcohol abuse. Also, gists of these discount rates were predictive of risk-taking, demonstrating a predictive capacity from a single Likert measure that rivaled or surpassed the predictive ability of more elaborate measures with high reliability. All of these effects were found even after controlling for sensation seeking, and gists of gender-linked discount rates predicted variance in risk-taking beyond that which is predicted by mere reward sensitivity.

As expected, the gender-linked effect found in this research corroborates previous work on gender expectations and stereotypes. For example, in a study in which participants attributed certain stereotypes to either males or females, they overwhelmingly selected that ordinary and masculine males are more likely to "get drunk" and "drink beer" and that both ordinary and feminine females were not associated with either (Landrine, Bardwell, & Dean, 1988). The present evidence is consistent with that study's conclusions that drinking beer and getting drunk are aspects of the traditional male gender identity. This link with male gender identity is also demonstrated through consumer behavior, in that males tend to spend more on

beverages than females (including alcoholic beverages, which tends to be the greater cause of expense in this category; Rick, 2008).

Correspondingly, prior work also supports that chocolate and sweet candy is feminized in popular culture and advertising, with both positive and negative links to stereotypical gender identity—both as a source of pleasure and as a danger or addiction to be avoided (Benford & Gough, 2006). The link to gender identity can also be found in gender differences regarding how chocolate and sweet candy is rated perceptually: women have been found to rate that they like and eat chocolate more than men (Yuker, 1997). It is important to note, however, that these differences in stereotypes and identity are most likely not related to any biophysical cause, as research into differences in sensory perception finds no difference in thresholds for tasting sweetness (i.e., sucrose; although differences in thresholds have been found for citric acid and salt in which females are more sensitive) and that no gender differences are found in ratings of intensities of primary flavors (Cowart, 1989). The difference in reward value found in the present research thus is likely to be found in the meaning that is differentially attached to these products.

The results found here also thus have implications for how research on neurological reward circuits is interpreted. The reward value of foods has been associated with biological responses through neurological research that found that the medial orbitofrontal cortex and dorsolateral prefrontal cortex are active during the processing of willingness to pay for sweet and salty junk food (Plassmann, O'Doherty, & Rangel, 2007). Prior work has also found that activity in the ventral striatum, medial prefrontal cortex, and posterior cingulate cortex has been associated with the subjective value of delayed rewards, as used in the present study (Kable & Glimcher, 2007). This suggests that future research could investigate the extent to

which these activations are differentially determined by the meaning placed on reward items—for example, the possibility that one gender would show decreased activation for those products that do not have a meaningful link to stereotypes of gender identity. Although prior work has identified regions that encode subjective value on a common scale, or "common currency", as well as evidence for domain-specific reward areas (Levy & Glimcher, 2012), this work suggests that there may be even more specific activations based on gender. Neurological research should address the finding that different commodities are meaningfully rewarding to different people, and these differences will likely be exhibited through functional analysis. In the light of recent research that demonstrates that the taste of beer—independent of the effect of alcohol—provokes the release of dopamine in males (Oberlin et al., 2013), it is possible that an experiment testing the present task under functional imaging could identify differential activation associated with impulsivity in response to gender-linked rewards that is associated with advanced cognitive processing centers, such as the orbitofrontal cortex, as well as dopaminergic areas.

The final major relevant conclusion from this data pertains to the fact that gists of temporal discounting rates were more predictive of outcomes than were the original discount rates themselves, after controlling for sensation seeking. This measure had more success in predictive ability for a number of reasons. First, specific temporal discounting rates are very context dependent. This requires the elaborate discounting measures to calibrate to populations, products, and contexts, a limitation that did not affect the single gist item. Additionally, when one gender was faced with tasks that did not involve their gender-linked commodity (e.g., when males made decisions about candy), both males and females were more uniformly compensatory in their thinking. In other words, both males and females

demonstrated more impulsivity in temporal discount rates when they were choosing among products with the predicted gender-linked effect.

It is our hypothesis that the gists of discounting for the gender-linked products were more predictive of risk-taking because the question about a gender-linked item was more meaningful to that individual. Thus the gender-linked items are more likely to elicit the person's impulsivity that would be evoked when taking other risks. Participants in the pilot experiment had insight and interpretations of the stereotypical behavior of each gender regarding consumption of the product that was hypothesized to have a link to that gender. This result suggests that patterns of impulsivity (with their respective gender-linked products) are associated not merely with a social norm, but rather with interpretations and insight regarding those norms. Since participants in the pilot study revealed that the norm would be for each gender to want more of their respective gender-linked product, one might expect that people would be more willing to wait to receive more of the gender-linked product in the choice, if behavior were driven merely by desire to conform to a norm, or the transmission of a social rule. This was not found in the data. Instead, the social norms communicate to people that they should like their respective gender-linked product more. However, this is not sufficient to explain the link we observed between impulsivity and risk-taking. Instead, identity, anything that is meaningfully interpreted as part of identity, is more motivating. Thus, gender linked items are more diagnostic of underlying motivation and hence a better predictor. In this way it acts as a meaningful stimulus in the temporal discounting questions, revealing one's impulsivity better than would a stimulus that isn't meaningful. This result is consistent with the notion that institutions promoting public health may have significant impact if they can alter the social meanings of reckless behavior (Sunstein, 2008).

The single gist item thus more reliably assessed meaningful representations of impulsivity that were more enduring and more likely to be independent of specific numerical values (e.g., currency value or time periods). More specifically, the impulsivity captured by this single gender-linked gist item (either about money or about alcohol or candy) was predictive of risk-taking across domains, including the many behaviors measured by the ARQ, such as unprotected sex and substance abuse. In other words, candy and alcohol predicted unrelated behaviors on the ARQ. A theory of social norms such as the theory of reasoned action would not predict this result, because it assumes that social norms are domain specific (e.g., use of a condom for vaginal sex might not predict behavior about condom use for anal sex; Fishbein, 2008). Although there is a single ARQ item regarding overeating, impulsivity with candy was predictive of the whole scale, not just that item.

Moreover, these results demonstrate that there are things that are meaningful to people other than money that can elicit the mechanisms of reward and impulsivity, and that these things are reinforcing because they have symbolic value to gender identity. This result can be interpreted as broadly consistent with the hypothesis in temporal discounting research pertaining to current and future identity, specifically that when one's manipulated sense of continuity with future self is lower, subjects are more likely to behave impulsively and demonstrate higher discount rates (Bartels & Urminsky, 2011). Future research could assess individuals' adherence to gender norms or relative importance of gender identity and subsequently test the relative ability for these gender-linked measures to predict unhealthy risk-taking and unhealthy outcomes.

As previously discussed, these measures and processes pertaining to self-control and impulsivity have been implicated in predicting many unhealthy outcomes pertaining to

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substance abuse and nutrition.  The risky behaviors measured in this study are major

contributors to morbidity and mortality, through obesity, diabetes, and alcohol abuse.  There

is increasing evidence that neurological processes that underlie reward sensitivity and

inhibitory control can lead to both compulsive eating and substance abuse (Volkow, Wang,

Tomasi, & Baler, 2013), and that strategies to prevent and treat each of these could both

include social strategies to decrease reinforcing properties of these items, as well as policy

strategies.  Health messages and interventions can thus be directed toward changing gist

representations of unhealthy behaviors, as these are the more stable representations that have

greater influence and predictive ability regarding risky outcomes.

Table 1

*Percentages of Endorsement of Men and Women's Product Preferences in the Pilot Study*

| | | What would a [man or woman] want more (i.e., have a greater desire for)? | | Which would a [man or woman] want more OF (i.e., number of servings)? | | Which of these is more closely linked to a [man or woman]'s identity? | |
|---|---|---|---|---|---|---|---|
| | | **Woman** | **Man** | **Woman** | **Man** | **Woman** | **Man** |
| | Alcohol | 26.2 | 92.8 | 36.7 | 91.4 | 16.1 | 81.4 |
| | Candy | 57.7 | 1.1 | 48.6 | 3.9 | 44.1 | 0.7 |
| | Neither | 9.7 | 4 | 12.6 | 2.9 | 35.8 | 16.1 |
| | Other | 6.5 | 2.2 | 2.2 | 1.8 | 3.9 | 1.8 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 |
| Gender of Respondent | | | | | | | |
| Male | Alcohol | 30.4 | 88.6 | 38 | 89.9 | 22.8 | 83.5 |
| | Candy | 45.6 | 1.3 | 45.6 | 3.8 | 36.7 | 0 |
| | Neither | 17.7 | 5.1 | 13.9 | 2.5 | 36.7 | 12.7 |
| | Other | 6.3 | 5.1 | 2.5 | 3.8 | 3.8 | 3.8 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 |
| | | | | | | | |
| Female | Alcohol | 24.6 | 94.4 | 36.4 | 92 | 13.6 | 80.9 |
| | Candy | 62.3 | 1 | 49.5 | 4 | 47.2 | 1 |
| | Neither | 6.5 | 3.5 | 12.1 | 3 | 35.2 | 17.1 |
| | Other | 6.5 | 1 | 2 | 1 | 4 | 1 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 |

*Notes*. Percentages of participants endorsing that either men or women would prefer either candy, alcohol, neither, or other, when posed as which the man or woman would want more (i.e., have a greater desire for), which the man or woman would want more of (i.e., number of servings), and which would be more closely linked to the man or woman's identity. Respondents answered each question regarding both men and women, and thus columns total 100% across product options (i.e., alcohol, candy, neither or other).

Table 2

*Spearman rho correlations between temporal discounting predictors (discount rates and the single gist item) and risky outcomes (ARQ, AUDIT, and spendthrift)*

| | Correlation with Discount Rates ($\varrho$) | | | | Correlation with Gist item ($\varrho$) | | | |
| | Alcohol | | Candy | | Alcohol | | Candy | |
| | Men | Women | Men | Women | Men | Women | Men | Women |
|---|---|---|---|---|---|---|---|---|
| ARQ | .16* | .08 | .05 | .11* | .14* | .01 | .08 | .12* |
| Rebellion | .20** | .11* | .12* | .15** | .18* | .04 | .14* | .13* |
| Thrill-seeking | -.01 | .01 | -.02 | -.01 | -.05 | -.05 | -.03 | .02 |
| Recklessness | .16* | .09 | .02 | .12** | .14* | .01 | .09 | .09* |
| Antisocial | .13* | -.01 | -.02 | .00 | .14* | -.04 | .02 | .00 |
| | | | | | | | | |
| AUDIT | .15* | .08 | .07 | .10* | .10 | .05 | .10 | .08 |
| Consumption | .16* | .10* | .11 | .12** | .08 | .06 | .12 | .09* |
| Dependence | .18** | .02 | .06 | .00 | .12 | .00 | .06 | -.02 |
| Related | | | | | | | | |
| Problems | .07 | -.04 | -.01 | .00 | .10 | -.01 | .03 | -.01 |
| | | | | | | | | |
| Spendthrift | .24** | .07 | .18** | .13** | .17** | .09* | .16** | .15** |

*Notes*. * - $p < .05$; ** - $p < .01$

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Table 3

*Regressions to predict ARQ with models based on either discount rates or gists in experiment*

*1*

| Model & Predictors | β | t | Sig. |
|---|---|---|---|
| **Model A – DV: ARQ** | | | |
| $R^2 = .311$ | | | |
| (Constant) | | **10.987** | **.000** |
| Hoyle BSSS mean score | **.539** | **16.736** | **.000** |
| Gender | -.009 | -.125 | .900 |
| Alcohol Discount Rate | **.269** | **2.018** | **.044** |
| Candy Discount Rate | -.160 | -1.161 | .246 |
| Alcohol Discount Rate x Gender | -.239 | -1.606 | .109 |
| Candy Discount Rate x Gender | .183 | 1.175 | .240 |
| | | | |
| **Model B – DV: ARQ** | | | |
| $R^2 = .303$ | | | |
| (Constant) | | **7.239** | **.000** |
| Hoyle BSSS mean score | **.531** | **18.340** | **.000** |
| Gender | .075 | .712 | .477 |
| Alcohol Gist Discounting Item | **.397** | **3.181** | **.002** |
| Candy Gist Discounting Item | **-.254** | **-2.038** | **.042** |
| Alcohol Gist Discounting Item x Gender | **-.544** | **-3.314** | **.001** |
| Candy Gist Discounting Item x Gender | **.405** | **2.451** | **.014** |

Table 4

*Regressions to predict ARQ with models based on discount rates, gists, or MCQ in*

*experiment 2*

| Model & Predictors | β | t | Sig. |
|---|---|---|---|
| **Model A – DV: ARQ** | | | |
| $R^2 = .383$ | | | |
| (Constant) | | **4.922** | **.000** |
| Hoyle BSSS mean score | **.584** | **9.919** | **.000** |
| Gender | -.027 | -.206 | .837 |
| Alcohol Discount Rate | -.054 | -.175 | .861 |
| Candy Discount Rate | .066 | .235 | .815 |
| Money Discount Rate | -.029 | -.115 | .909 |
| Alcohol Discount Rate x Gender | .136 | .417 | .677 |
| Candy Discount Rate x Gender | -.099 | -.325 | .745 |
| Money Discount Rate x Gender | .126 | .471 | .638 |
| | | | |
| **Model B – DV: ARQ** | | | |
| $R^2 = .294$ | | | |
| (Constant) | | **6.430** | **.000** |
| Hoyle BSSS mean score | **.508** | **11.639** | **.000** |
| Gender | .118 | 1.185 | .237 |
| Alcohol Gist Discounting Item | .041 | .186 | .853 |
| Candy Gist Discounting Item | .115 | .515 | .607 |
| Money Gist Discounting Item | **.417** | **2.422** | **.016** |
| Alcohol Gist Discounting Item x Gender | .031 | .137 | .891 |
| Candy Gist Discounting Item x Gender | -.086 | -.373 | .709 |
| Money Gist Discounting Item x Gender | **-.392** | **-2.162** | **.031** |
| | | | |
| **Model C – DV: ARQ** | | | |
| $R^2 = .276$ | | | |
| (Constant) | | **13.583** | **.000** |
| BSSS score | **.497** | **11.356** | **.000** |
| Gender | -.018 | -.361 | .718 |
| Kirby MCQ Discount Rate | **.356** | **2.285** | **.023** |
| Kirby MCQ Discount Rate x Gender | **-.337** | **-2.159** | **.031** |

Figure Caption

*Figure 1*. Histograms of the gist of both candy and alcohol. 1 - "Later is always better than now." 2 - "Later is mostly better than now." 3 - "The amount of waiting time and the number of drinks both matter." 4 - "Now is mostly better than later." 5 - "Now is always better than later."
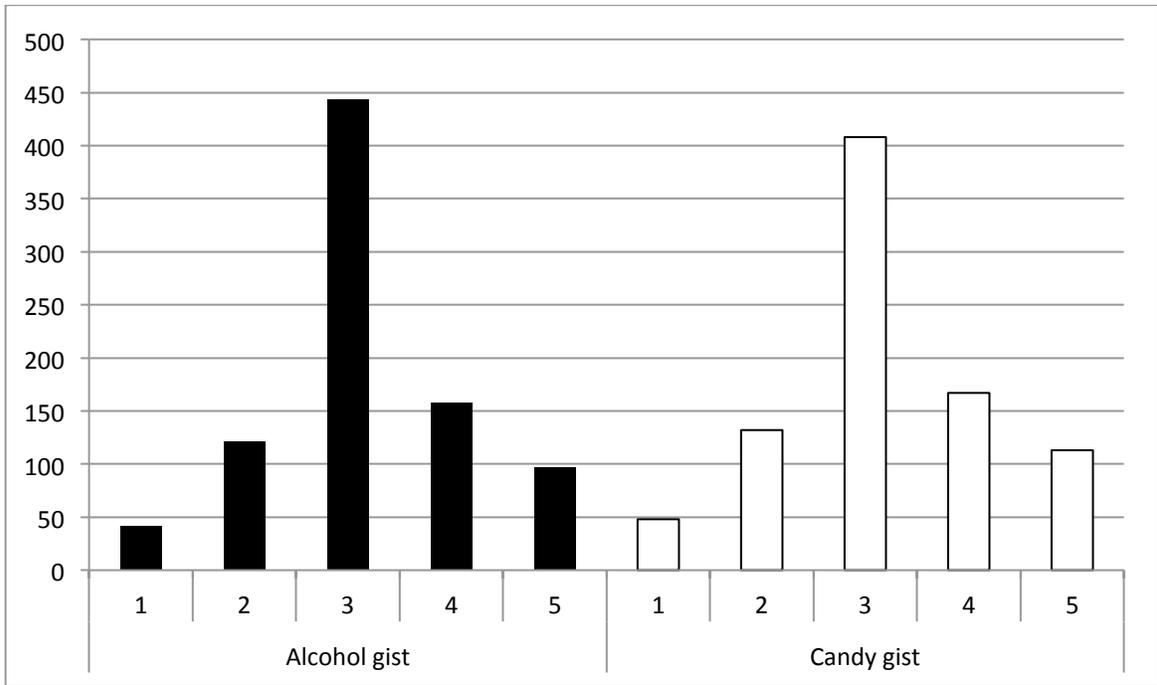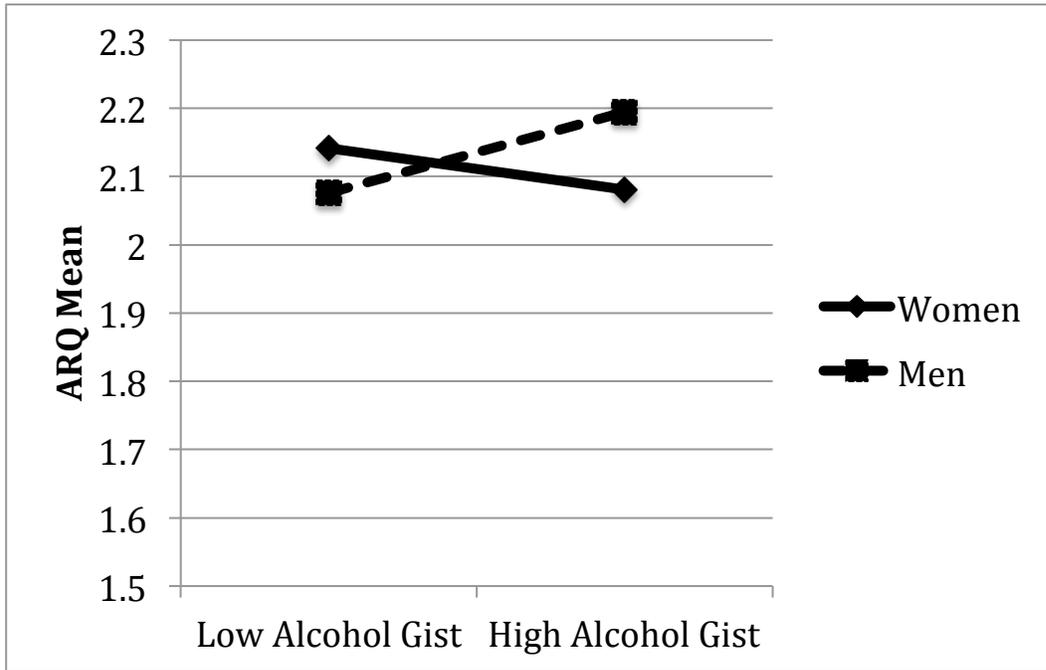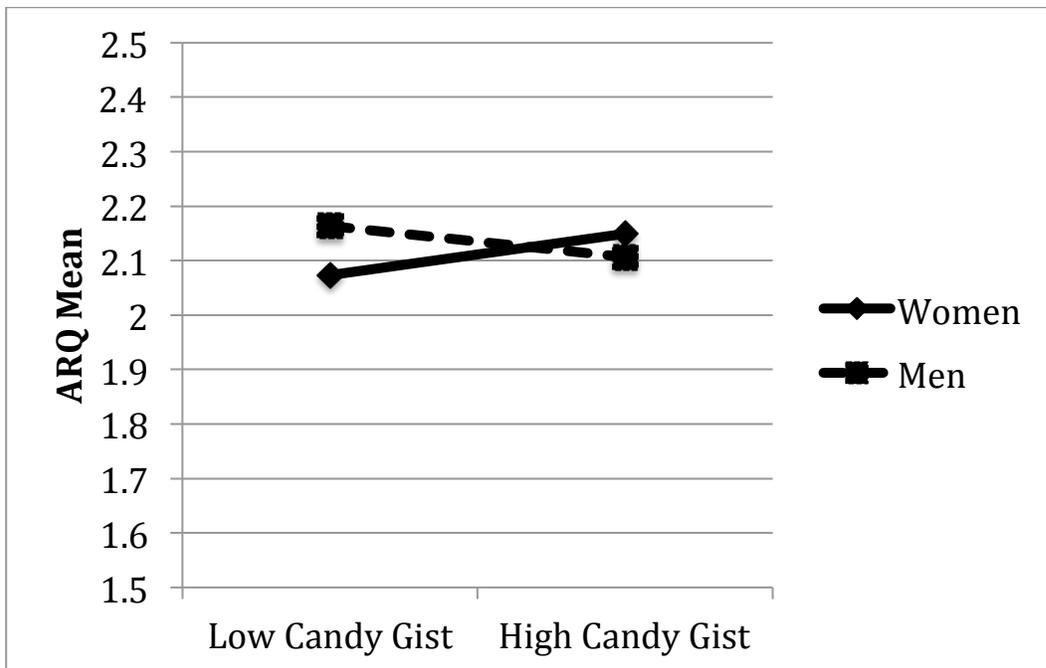
Figure Caption

*Figure 2*.  Illustration of interaction between gender and the gist of discount rates for both

alcohol *(a)* and candy *(b)*.

*(a)*



*(b)*

Appendix A

Descriptive Statistics for All Variables in Experiments 1 and 2

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Experiment 1 | | | | | |
| Alcohol Discount Rate | 745 | 1 | 5 | 2.5758 | 1.52575 |
| Candy Discount Rate | 798 | 1 | 5 | 2.6291 | 1.55623 |
| Alcohol Gist | 862 | 1 | 5 | 3.1705 | 0.96989 |
| Candy Gist | 868 | 1 | 5 | 3.1901 | 1.02542 |
| Hoyle BSSS | 868 | 1 | 5 | 3.2281 | 0.73828 |
| Spendthrift scale | 868 | 1 | 4.17 | 2.1608 | 0.53808 |
| ARQ | 868 | 1 | 3.65 | 2.1154 | 0.37307 |
| CRT | 869 | 0 | 3 | 1.42 | 1.121 |
| AUDIT | 868 | 0 | 28 | 4.54 | 5.026 |
| | | | | | |
| Experiment 2 | | | | | |
| Alcohol Discount Rate | 245 | 1 | 5 | 2.2449 | 1.60596 |
| Candy Discount Rate | 327 | 1 | 5 | 2.4159 | 1.36278 |
| Money Discount Rate | 370 | 1 | 5 | 2.0081 | 1.04243 |
| Alcohol Gist | 393 | 1 | 5 | 3.94 | 1.456 |
| Candy Gist | 393 | 1 | 5 | 4 | 1.431 |
| Money Gist | 391 | 1 | 5 | 4.26 | 1.146 |
| Kirby discount rate (K) | 392 | 0 | 0.25 | 0.0268 | 0.05095 |
| Spendthrift | 393 | 1 | 4.00 | 2.1258 | 0.51267 |
| BSSS | 393 | 1 | 5 | 3.1837 | 0.74566 |
| ARQ | 393 | 1 | 3.39 | 2.1007 | 0.36778 |
| AUDIT | 393 | 0 | 41 | 10.67 | 8.967 |
| CRT | 389 | 0 | 3 | 1.53 | 1.109 |

Appendix  B

Full Survey

You are invited to participate in a research study of risk and decision making. You were selected as a possible participant because you are 18 years of age or older and can understand and respond to a questionnaire written in English.  Please read this form carefully and ask any questions you may have before agreeing to take part in the study.  What the study is about: The purpose of this study is to understand how people make decisions that involve risks. What we will ask you to do: If you agree to be in this study, we will ask you to do the following:  Respond to a written questionnaire about how you view various risks and decisions (as well as provide background information).  The questionnaire usually takes about 30 minutes to complete although some people may take longer).  Risks and Benefits:  We do not anticipate any risks for you participating in this study other than those encountered in day-to-day life.  There are no direct benefits to participating other than the possibility that some people may gain greater insight into their own thinking and decision making.  Indirect benefits to participation include contribution to scientific knowledge, which the investigator hopes will ultimately improve risk communication and healthy decision making. Compensation:  You may earn extra credit if you are taking a class that offers credit for research studies.  The class instructor will assign credit according to class policy.  Taking part is voluntary: Taking part in this study is completely voluntary.  You may skip any questions that you do not want to answer.  If you decide not to take part or to skip some of the questions, it will not affect your current or future relationship with Cornell University. If you decide to take part, you are free to withdraw at anytime.  You are free to stop at any time for any reason.  Your answers will be confidential: The records of this study will be kept private. In any sort of report we make public, we will not include any information that will make it reasonably possible to identify you.  Research records will be kept in a locked file or office, and on computers used for data storage and analysis; only the researchers or other authorized individuals will have access to the records.  Your data may also be used for educational purposes such as teaching, publications, and/or presentations and may be viewed by students, other trainees, and professional colleagues.  If you have questions: The researcher(s) conducting this study is Dr. Valerie Reyna.  Please ask any questions you have now. If you have questions later, you may contact the investigator by telephone at (607) 254-1172;by email at vr53@cornell.edu; and by mail at Department of Human Development, MVR B44, Cornell University, Ithaca, NY 14853.  If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board at 607-255-5138, or access their website at http://www.irb.cornell.edu/.  You may also report your concerns or complaints anonymously through Ethicspoint or by calling toll free at 1-866-293-3077. Ethicspoint is an independent organization that serves as a liaison between the University and the person bringing the complaint so that anonymity can be ensured.

Statement of Consent: I have read the above information, and have received answers to any questions I asked. I consent to take part in the study. Please select an option below:
○ I am 18 years or older and I agree to participate in this study.
○ I do not agree to participate in this study.


Thank you so much for volunteering to be in our study, helping us to better understand how people make decisions. It is important that you respond to all items by circling only one choice. We are interested only in your likes or feelings, not in how others feel about these things or how one is supposed to feel. There are no right or wrong answers as in other kinds of tests. Do not put your name anywhere on the survey. Please be honest (we won't know who you are). It is much better to give your best guess than to skip a question. Base your answers on what you would really do in real life. You can withdraw at any time without causing bad feelings. Feel free to ask questions if anything is unclear. Treat each decision separately, as though you were making only that one decision.

Thank you so much for volunteering to be in our study, helping us to better understand how people make decisions. It is important that you respond to all items by circling only one choice. We are interested only in your likes or feelings, not in how others feel about these things or how one is supposed to feel. There are no right or wrong answers as in other kinds of tests. Do not put your name anywhere on the survey. Please be honest (we won't know who you are). It is much better to give your best guess than to skip a question. Base your answers on what you would really do in real life. You can withdraw at any time without causing bad feelings. Feel free to ask questions if anything is unclear. Treat each decision separately, as though you were making only that one decision.

DECISIONS: Assume that a "drink" means one small alcoholic drink of your choice (beer, wine or liquor). If you do not drink alcohol, imagine another type of beverage you enjoy. You do not have to drink everything in one sitting; assume that you can take it with you in unopened containers. Remember, we won't know who you are, so answer honestly. Treat each decision separately, as though you were making only that one decision. Please answer every question; better to guess than to leave it blank.

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 drinks for sure. | A 2/3 chance of getting 9 drinks and a 1/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely 5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 drink for sure. | A 2/3 chance of getting 3 drinks and a 1/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely 5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|
| 1 drink for sure. | A 1/3 chance of getting 6 drinks and a 2/3 chance of getting nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely 5 |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|
| 6 drinks for sure. | A 2/3 chance of getting 10 and a half drinks and a 1/3 chance of getting nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely 5 |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |

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| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 drinks for sure. | A 1/3 chance of getting 18 drinks and a 2/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 drink for sure. | A 1/3 chance of getting 3 drinks and a 2/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium | High | Completely |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 drink for sure. | A 2/3 chance of getting 1 and a half drinks and a 1/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 drinks for sure. | A 1/3 chance of getting 21 drinks and a 2/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

DECISIONS:  Assume that a "drink" means one small alcoholic drink of your choice (beer, wine or liquor).  If you do not drink alcohol, imagine another type of beverage you enjoy. You do not have to drink everything in one sitting; assume that you can take it with you in unopened containers. Remember, we won't know who you are, so answer honestly.  Treat each decision separately, as though you were making only that one decision. Please answer every question; better to guess than to leave it blank.

| Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|
| Lose 1 drink for sure. | A 2/3 chance of losing 1 and a half drinks and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|
| Lose 1 drink for sure. | A 1/3 chance of losing 3 drinks and a 2/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 6 drinks for sure. | A 1/3 chance of losing 18 drinks and a 2/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 1 drink for sure. | A 1/3 chance of losing 6 drinks and a 2/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 6 drinks for sure. | A 2/3 chance of losing 10 and a half drinks and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 6 drinks for sure. | A 1/3 chance of losing 21 drinks and a 2/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 1 drink for sure. | A 2/3 chance of losing 3 drinks and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 6 drinks for sure. | A 2/3 chance of losing 9 drinks and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

DECISIONS:  Assume that a "candy bar" means one small (fun size, treat size, or snack size) candy bar of your choice. You do not have to eat everything in one sitting; assume that you can take it with you in unopened containers.  Treat each decision separately, as though you were making only that one decision. Remember, we won't know who you are, so answer honestly.  Please answer every question; better to guess than to leave it blank.

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 candy bar for sure. | A 1/3 chance of getting 3 candy bars and a 2/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 candy bar for sure. | A 1/3 chance of getting 6 candy bars and a 2/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 candy bar for sure. | A 2/3 chance of getting 1 and a half candy bars and a 1/3 chance of getting nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 candy bar for sure. | A 2/3 chance of getting 3 candy bars and a 1/3 chance of getting | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 candy bars for sure. | A 1/3 chance of getting 18 candy bars and a 2/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High   4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 candy bars for sure. | A 1/3 chance of getting 21 candy bars and a 2/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High   4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|
| 6 candy bars for sure. | A 2/3 chance of getting 9 candy bars and a 1/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|
| 6 candy bars for sure. | A 2/3 chance of getting 10 and a half candy bars and a 1/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |

DECISIONS: Assume that a "candy bar" means one small (fun size, treat size, or snack size) candy bar of your choice. You do not have to eat everything in one sitting; assume that you can take it with you in unopened containers. Treat each decision separately, as though you were making only that one decision. Remember, we won't know who you are, so answer honestly. Please answer every question; better to guess than to leave it blank.

| Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|
| Lose 1 candy bar for sure. | A 1/3 chance of losing 6 candy bars and a 2/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|
| Lose 6 candy bars for sure. | A 2/3 chance of losing 9 candy bars and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 1 candy bar for sure. | A 2/3 chance of losing 1 and a half candy bars and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High   4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 1 candy bar for sure. | A 1/3 chance of losing 3 candy bars and a 2/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High   4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 6 candy bars for sure. | A 2/3 chance of losing 10 and a half candy bars and a 1/3 chance of losing nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose 6 candy bars for sure. | A 1/3 chance of losing 18 candy bars and a 2/3 chance of losing nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| Lose 6 candy bars for sure. ❍ | A 1/3 chance of losing 21 candy bars and a 2/3 chance of losing nothing. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely 5 ❍ |



| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| Lose 1 candy bar for sure. ❍ | A 2/3 chance of losing 3 candy bars and a 1/3 chance of losing nothing. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely 5 ❍ |

DECISIONS: Assume that dollar values represent exact values in cash and that you can take it with you. Treat each decision separately, as though you were making only that one decision. Remember, we won't know who you are, so answer honestly. Please answer every question; better to guess than to leave it blank.

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $1 for sure. | A 1/3 chance of getting $3 and a 2/3 chance of getting nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $6 for sure. | A 2/3 chance of getting $10.50 and a 1/3 chance of getting nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $1 for sure. | A 2/3 chance of getting $3 and a 1/3 chance of getting nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $1 for sure. | A 1/3 chance of getting $6 and a 2/3 chance of getting nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $1 for sure. | A 2/3 chance of getting $1.50 and a 1/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $6 for sure. | A 1/3 chance of getting $21 and a 2/3 chance of getting nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | | A 1/3 chance of getting $18 and a 2/3 chance of getting nothing. | | | | | |
| | $6 for sure. | | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| ❍ | ❍ | | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | | A 2/3 chance of getting $9 and a 1/3 chance of getting nothing. | | | | | |
| | $6 for sure. | | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| ❍ | ❍ | | ❍ | ❍ | ❍ | ❍ | ❍ |

DECISIONS: Assume that dollar values represent exact values in cash and that you can take it with you. Treat each decision separately, as though you were making only that one decision. Remember, we won't know who you are, so answer honestly.  Please answer every question; better to guess than to leave it blank.

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose $1 for sure. | A 1/3 chance of losing $6 and a 2/3 chance of losing nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose $1 for sure. | A 1/3 chance of losing $3 and a 2/3 chance of losing nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose $6 for sure. | A 1/3 chance of losing $18 and a 2/3 chance of losing nothing. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose $6 for sure. | A 2/3 chance of losing $9 and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose $6 for sure. | A 2/3 chance of losing $10.50 and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose $6 for sure. | A 1/3 chance of losing $21 and a 2/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose $1 for sure. | A 2/3 chance of losing $3 and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | Lose $1 for sure. | A 2/3 chance of losing $1.50 and a 1/3 chance of losing nothing. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

DECISIONS:  Assume that a "drink" means one small alcoholic drink of your choice (beer, wine or liquor).  If you do not drink alcohol, imagine another type of beverage you enjoy. You do not have to drink everything in one sitting; assume that you can take it with you in unopened containers. Remember, we won't know who you are, so answer honestly.  Treat each decision separately, as though you were making only that one decision. Please answer every question; better to guess than to leave it blank.

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 drink right now. | Getting 3 drinks in a month. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 drinks right now. | Getting 10 and a half drinks in a month. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 drinks right now. | Getting 18 drinks in a month. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 drinks right now. ○ | Getting 21 drinks in a month. ○ | Not at all 1 ○ | Low  2 ○ | Medium  3 ○ | High  4 ○ | Completely5 ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 drink right now. ○ | Getting 3 drinks in a month. ○ | Not at all 1 ○ | Low  2 ○ | Medium  3 ○ | High  4 ○ | Completely5 ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 drink right now. ○ | Getting 6 drinks in a month. ○ | Not at all 1 ○ | Low  2 ○ | Medium  3 ○ | High  4 ○ | Completely5 ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 drink right now. | Getting 1 and a half drinks in a month. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 drinks right now. | Getting 9 drinks in a month. | Not at all 1 | Low  2 | Medium  3 | High  4 | Completely5 |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

For YOU, what is the GIST of these choices about drinks now versus in a month?
○  Now is always better than later.
○  Now is mostly better than later.
○  Later is always better than now.
○  Later is mostly better than now.
○  The amount of waiting time and the number of drinks both matter.

DECISIONS: Assume that a "candy bar" means one small (fun size, treat size, or snack size) candy bar of your choice. You do not have to eat everything in one sitting.  Treat each decision separately, as though you were making only that one decision. Remember, we won't know who you are, so answer honestly.  Please answer every question; better to guess than to leave it blank.

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 candy bars right now. ❍ | Getting 9 candy bars in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely 5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 candy bar right now. ❍ | Getting 6 candy bars in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely 5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 candy bars right now. ❍ | Getting 10 and a half candy bars in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely 5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 candy bar right now. ❍ | Getting 1 and a half candy bars in a month. ❍ | Not at all 1 ❍ | Low  2 ❍ | Medium  3 ❍ | High  4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 candy bars right now. ❍ | Getting 18 candy bars in a month. ❍ | Not at all 1 ❍ | Low  2 ❍ | Medium  3 ❍ | High  4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 candy bar right now. ❍ | Getting 3 candy bars in a month. ❍ | Not at all 1 ❍ | Low  2 ❍ | Medium  3 ❍ | High  4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 6 candy bars right now. | Getting 21 candy bars in a month. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | 1 candy bar right now. | Getting 3 candy bars in a month. | Not at all 1 | Low 2 | Medium 3 | High 4 | Completely5 |
| | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

For YOU, what is the GIST of these choices about candy bars now versus in a month?
❍  Now is always better than later.
❍  Now is mostly better than later.
❍  Later is always better than now.
❍  Later is mostly better than now.
❍  The amount of waiting time and the amount of candy both matter.

DECISIONS: Assume that dollar values represent exact values in cash and that you can take it with you. Treat each decision separately, as though you were making only that one decision. Remember, we won't know who you are, so answer honestly.  Please answer every question; better to guess than to leave it blank.

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $1 right now. ❍ | Getting $1.50 in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $6 right now. ❍ | Getting $10.50 in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $1 right now. ❍ | Getting $3 in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $6 right now. ❍ | Getting $21 in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $6 right now. ❍ | Getting $18 in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $6 right now. ❍ | Getting $9 in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $1 right now. ❍ | Getting $6 in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely5 ❍ |

| | Which would you choose? | | How confident are you in your decision? | | | | |
|---|---|---|---|---|---|---|---|
| | $1 right now. ❍ | Getting $3 in a month. ❍ | Not at all 1 ❍ | Low 2 ❍ | Medium 3 ❍ | High 4 ❍ | Completely5 ❍ |

For YOU, what is the GIST of these choices about money now versus in a month?
- ❍ Now is always better than later.
- ❍ Now is mostly better than later.
- ❍ Later is always better than now.
- ❍ Later is mostly better than now.
- ❍ The amount of waiting time and the amount of money both matter.

If you do NOT drink alcohol at all, CHECK HERE:
- ❍ I do not drink alcohol

What type of drink did you imagine during the earlier questions?
- ❍ beer
- ❍ wine
- ❍ hard alcohol shots (i.e. vodka, whiskey, rum, tequila)
- ❍ mixed drinks (i.e. martinis, whiskey sour, Tom Collins)
- ❍ Other: _____

How many ounces was that drink? (remember that a bottle/can of beer is 12oz, a glass of wine is 4oz and a shot of alcohol is 1oz)

What candy did you imagine during the earlier questions?

How large was that candy bar/package?
- ❍ king size
- ❍ fun/snack size
- ❍ miniature
- ❍ normal size
- ❍ other: _____

How would you rate your hunger on the following scale at the present moment?
- ❍ ExtremelyHungry1
- ❍   2
- ❍   3
- ❍   4
- ❍   5
- ❍   6
- ❍   7
- ❍   8
- ❍   9
- ❍ Not at allHungry10

How would you rate your thirst on the following scale at the present moment?
- ○ ExtremelyThirsty1
- ○   2
- ○   3
- ○   4
- ○   5
- ○   6
- ○   7
- ○   8
- ○   9
- ○ Not at allThirsty10


Please indicate your agreement or disagreement with the following statements. Choose one:

I cannot seem to save money.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree


I spend more than I can afford to spend.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree


I borrow money to buy things I enjoy.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I am worried about the amount of money that I owe.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I think it is better to spend now and worry later.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I think it is better to save money for the future.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I never borrow money.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I think it is better to go without something I want until I can afford to pay for it.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I save up money to buy things I enjoy.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I spend money on having fun today and don't worry about tomorrow.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I wait to buy what I want until I have enough money.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I believe in sacrifice now, enjoy later.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

Please indicate your agreement or disagreement with the following statements. Choose one:

I would like to explore strange places.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree


I get restless when I spend too much time at home.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree


I like to do frightening things.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree


I like wild parties
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree


I would like to take off on a trip with no pre-planned routes or timetables.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I prefer friends who are excitingly unpredictable.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I would like to try bungee jumping.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

I would love to have new and exciting experiences, even if they are illegal.
- ○ strongly disagree
- ○ Disagree
- ○ Neither Agree nor Disagree
- ○ Agree
- ○ Strongly Agree

Answer these questions according to how often you have done the following:    Choose one.

Smoking (tobacco)
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Roller Blading
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Drinking and driving
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Parachuting
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Speeding
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Stealing cars and going for joy rides
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Tao Kwon Do fighting
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Underage drinking
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Staying out late
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Driving without a license
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Talking to strangers
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Flying in a plane
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Cheating
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Getting drunk
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Sniffing gas or glue
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Having unprotected sex
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Leaving school
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often

Teasing and picking on people
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Snow skiing
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Snow boarding
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Taking drugs (including marijuana)
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Overeating
- ○ Never
- ○ Hardly Never
- ○ Sometimes
- ○ Often
- ○ Very Often

Entering a competition
- ❍ Never
- ❍ Hardly Never
- ❍ Sometimes
- ❍ Often
- ❍ Very Often


Give your best answer to the following 3 questions.  It is better to guess than to leave them blank:

A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost? (in cents)

 If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?  (in minutes)

In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the  patch to cover half of the lake? (in days)

The following questions will be used to assess how much a person typically could eat or drink at a certain body mass. If you don't know exactly, please estimate. Again, your answers are completely confidential and we will not be able to identify you.

Your height:in feet and inches

Your weightin lbs

Remember that all answers are completely anonymous. Please answer the following questions to the best of your ability.

How often do you have a drink containing alcohol?
- ❍ Never
- ❍ Monthly or less
- ❍ 2 to 4 times a month
- ❍ 2 to 3 times a week
- ❍ 4 or more times a week

How many drinks containing alcohol do you have on a typical day when you are drinking?

❍ 1 or 2
❍ 3 or 4
❍ 5 or 6
❍ 7, 8 or 9
❍ 10 or more

How often do you consume 6 or more drinks on one occasion?

❍ Never
❍ Less than monthly
❍ Monthly
❍ Twice a Month
❍ Weekly
❍ Daily or almost daily

How often do you consume 4 or more drinks on one occasion (within about two hours)?

❍ Never
❍ Less than monthly
❍ Monthly
❍ Twice a Month
❍ Weekly
❍ Daily or almost daily

How often do you consume 5 or more drinks on one occasion (within about two hours)?

❍ Never
❍ Less than monthly
❍ Monthly
❍ Twice a Month
❍ Weekly
❍ Daily or almost daily

How often during the last year have you found that you were not able to stop drinking once you had started?

❍ Never
❍ Less than monthly
❍ Monthly
❍ Weekly
❍ Daily or almost daily
❍ Twice a Month

How often during the last year have you failed to do what was normally expected from you because of drinking?
❍ Never
❍ Less than monthly
❍ Monthly
❍ Twice a month
❍ Weekly
❍ Daily or almost daily


How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
❍ Never
❍ Less than monthly
❍ Monthly
❍ Weekly
❍ Daily or almost daily
❍ Twice a Month


How often during the last year have you had a feeling of guilt or remorse after drinking?
❍ Never
❍ Less than monthly
❍ Monthly
❍ Twice a Month
❍ Weekly
❍ Daily or almost daily


How often during the last year have you been unable to remember what happened the night before because you had been drinking?
❍ Never
❍ Less than monthly
❍ Monthly
❍ Twice a Month
❍ Weekly
❍ Daily or almost daily


Have you or someone else been injured as a result of your drinking?
❍ No
❍ Yes, but not in the last year
❍ Yes, during the last year

Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

❍  No
❍  Yes, but not in the last year
❍  Yes, during the last year


The purpose of the present study is to compare your preferences for different amounts of money. In this experiment you will be asked to make a series of decisions about hypothetical monetary alternatives. One monetary choice will be available immediately (now), while the other monetary alternative will be available after a certain time delay. Please keep in mind, that there are no "correct" answers. We are only interested in which option you would prefer. Please answer every question as truthfully as possible.

What would you prefer?
❍  $54 now
❍  $55, 117 days from now


What would you prefer?
❍  $55 now
❍  $75, 61 days from now


What would you prefer?
❍  $19 now
❍  $25, 53 days from now


What would you prefer?
❍  $31 now
❍  $85, 7 days from now


What would you prefer?
❍  $14 now
❍  $25, 19 days from now


What would you prefer?
❍  $47 now
❍  $50, 160 days from now

What would you prefer?

❍ $15 now

❍ $35, 13 days from now


What would you prefer?

❍ $25 now

❍ $60, 14 days from now


What would you prefer?

❍ $78 now

❍ $80, 162 days from now


What would you prefer?

❍ $40 now

❍ $55, 62 days from now


What would you prefer?

❍ $11 now

❍ $30, 7 days from now


What would you prefer?

❍ $67 now

❍ $75, 119 days from now


What would you prefer?

❍ $34 now

❍ $35, 186 days from now


What would you prefer?

❍ $27 now

❍ $50, 21 days from now


What would you prefer?

❍ $69 now

❍ $85, 91 days from now

What would you prefer?
- ❍ $49 now
- ❍ $60, 89 days from now


What would you prefer?
- ❍ $80 now
- ❍ $85, 157 days from now


What would you prefer?
- ❍ $24 now
- ❍ $35, 29 days from now


What would you prefer?
- ❍ $33 now
- ❍ $80, 14 days from now


What would you prefer?
- ❍ $28 now
- ❍ $30, 179 days from now


What would you prefer?
- ❍ $34 now
- ❍ $50, 30 days from now


What would you prefer?
- ❍ $25 now
- ❍ $30, 80 days from now


What would you prefer?
- ❍ $41 now
- ❍ $75, 20 days from now


What would you prefer?
- ❍ $54 now
- ❍ $60, 111 days from now

What would you prefer?

❍ $22 now

❍ $25, 136 days from now


What would you prefer?

❍ $20 now

❍ $55, 7 days from now


Now some basic information about you.

Your age is (in years):

You are:

❍ Male

❍ Female


Are you of Hispanic, Latino, or Spanish origin?

❍ No, not of Hispanic, Latino or Spanish origin

❍ Yes, Mexican, Mexican American, Chicano

❍ Yes, Puerto Rican

❍ Yes, Cuban

❍ Yes, Central American (FILL IN): _____

❍ Yes, South American (FILL IN): _____

❍ Yes, Spanish (Spain)


You are:

❍ White

❍ Black/ African American

❍ Asian Indian

❍ Chinese

❍ Filipino

❍ Japanese

❍ Korean

❍ Vietnamese

❍ Other Asian (FILL IN): _____

❍ Native American/ American Indian/ Alaskan Native (FILL IN Tribe): _____

❍ Native Hawaiian or Other Pacific Islander

❍ Mixed Ethnicity (example: Chicano and Native American, FILL IN): _____

❍ Other (FILL IN): _____

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