I, John B Dinsmore Jr., hereby submit this original work as part of the requirements for the degree of Doctor of Philosophy in Business Administration.

It is entitled:
The Mental Accounting of Partitioned Monetary and Nonmonetary Prices

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Committee chair: James Kellaris, PhD
The Mental Accounting of Partitioned Monetary and Nonmonetary Prices

A dissertation submitted to the Graduate School of The University of Cincinnati in partial fulfillment of the requirements of the degree of Doctor of Philosophy in the Department of Marketing in the College of Business

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ABSTRACT

Businesses frequently charge multiple, partitioned prices for products and services, some of them monetary (e.g., a traditional fee) and some nonmonetary (e.g., requiring a consumer to view an advertisement, share personal information, etc.). And inferences formed from those prices are key to consumer perception of the perceived risk of the product (Bearden & Shrimp, 1982; Peterson & Wilson, 1985), an attribute that is a key driver of consumption particularly with new products (Peter & Ryan, 1976; Gregan-Paxton & John, 1997, Moreau, Lehmann & Markman, 2001). This research integrates Thaler’s (1980; 1985) model of mental accounting and Hsee and Zhang’s (2010) General Evaluability Theory (GET) to demonstrate how various combinations of monetary and nonmonetary prices will affect the perceived risk of a product. In particular, the research finds that partitioned nonmonetary prices are categorically different in nature, evoke different sets of concerns, and remain segregated in the mind of the consumer, causing a product to be perceived as more risky. Partitioned monetary prices, however, are categorically similar, are more easily integrated, and hence do not increase perceived risk. Similar to partitioned nonmonetary prices, combining a monetary and nonmonetary price, as two categorically different prices, also increases the level of perceived risk for a product. GET is applied to discern if the cross-categorical pricing effect can be reversed or eliminated in a joint evaluatory mode.
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You tell'em what you know. You tell'em to find their voice and stay with it.

You tell the ones that have it to keep at it. You tell the ones that don't have it to keep at it too...because that's the only way they're gonna get to where they're going.

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*Taken from the movie “The Wonder Boys”*
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Monetary and Nonmonetary Prices

Businesses frequently charge multiple, partitioned prices for products and services, some of them monetary (e.g., a traditional fee) and some nonmonetary (e.g., requiring a consumer to view an advertisement, share personal information, etc.). How those combinations of prices are perceived depends a variety of factors. To date, analysis of partitioned prices in the research literature has been confined exclusively to monetary prices, despite the prominence of nonmonetary prices in the market, particularly in the technology, media and finance industries. With companies such as The New York Times, Facebook, NBC, Bank of America, Google and many others using nonmonetary prices to generate billions of dollars in revenue, this represents a significant gap in behavioral pricing research.

Both monetary and nonmonetary prices require something to be sacrificed by the consumer to obtain a good or service. Both are cues to higher quality and lower risk (Dinsmore, Dugan, Wright and Arroniz 2013). But, one requires the sacrifice of money and the other does not. Moreover, as even the thought of money changes a person’s mindset (Vohs, Mead, and Goode 2006) and behavior (Vohs, Mead, and Goode 2008), one might expect monetary and nonmonetary prices to be perceived differently, at least in some ways. The expense of a good may intuitively be encoded differently between the two types of prices, which raises the question: “Are the losses posed by monetary and nonmonetary prices perceived in the same way?”
Whereas studies of partitioned pricing suggest that consumers will often ignore additional charges or fees in their assessments (Morowitz, Greenleaf, & Johnson 1998), mental accounting (Thaler 1980; 1985) suggests an exception: prices that remain segregated (vs. integrated) in the mind of the consumer will be perceived as a larger (vs. smaller) loss.

This research establishes a theoretical basis for the risk perceptions of partitioned monetary and nonmonetary prices and conducts three studies to examine their effects on the perceived risk of a product. Results show that partitioned nonmonetary prices (having to share personal information vs. having to view ads, etc.) are categorically distinct, evoking different considerations and concerns (convenience vs. privacy vs. effort, etc.) among consumers. Consequently, these prices remain segregated in the mind of the consumer and make the product seem riskier. Conversely, partitioned monetary prices evoke the same considerations (financial) and are easily integrated along a continuum with other monetary prices. Additionally, as a monetary price is categorically distinct from a nonmonetary price, the combination also evokes diverse considerations, is difficult to integrate, and thus makes a product appear riskier.

Data suggest that whereas a multiple nonmonetary price condition increases perceived risk (experiment 1A), a multiple monetary price condition does not (experiment 1B). Experiment 2 shows that the combination of monetary and nonmonetary prices results in the perception of increased product risk.

Findings of this research contribute to pricing theory by expanding mental accounting, partitioned pricing, and General Evaluability Theory (GET) into both nonmonetary price only and combined monetary and nonmonetary pricing contexts. Specifically, this research identifies conditions where partitioned prices make a product appear more risky (as in the case of combining categorically different prices) as well as conditions where they do not affect risk (as
in the case with categorically similar prices). Further, the research utilizes GET in pursuit of conditions which would reverse the enhanced risk perceptions of categorically different prices.

Practitioners stand to benefit as many companies use nonmonetary pricing schemes in whole or in part for their businesses. For example, in 2012 Google generated $43.7 billion dollars (http://investor.google.com/financial/tables.html) from advertisements alone, representing the majority of their earnings as well as besting revenue generated by the entire U.S. print media (Oremus 2012). And Google is far from the exception. Goods and services supported by nonmonetary prices, sometimes referred to as “the free economy,” are rapidly proliferating. For example, since launching in 2008, the Google Android App Store sells approximately 146,000 mobile applications that are supported by nonmonetary prices, with “free” app downloads dwarfing the number of paid (Lunden, 2012).

As marketers and consumer psychologists, there are significant opportunities for contributions to both theory and practice in better understanding the innovation of the pricing models supporting these products. These findings could illuminate issues related to these pricing strategies and possible unintended consequences. For example, a manager might consider attempting to make a product appear “risk-free” by eliminating monetary prices and adding multiple nonmonetary prices could instead escalate the perceived level of performance risk. Further, this research aims to demonstrate steps that practitioners can take to manage the perceived risk resulting from the pricing scheme of their product.

THEORETICAL BACKGROUND
Specifying The Domain of Nonmonetary Prices

To date, the term “nonmonetary price” has referred to resources other than money sacrificed by the consumer in the process of acquiring a product or service. These sacrifices include time and effort related to the search, evaluation and selection of a product (Berry 1979, Guiltinan 1976; Jacoby, Szybillo, and Berning 1976; Peter and Ryan 1976; Zeithaml 1988). Additional nonmonetary prices within this conceptualization would include privacy and security concerns (Grewal et al. 2003), which are especially salient with social media and e-commerce. However, these incidental costs absorbed by consumers are not the domain of this research.

This research focuses on nonmonetary prices controlled by the firm and upon which exchange is contingent. These include, but are not limited to, requiring consumers to view or read advertisements, register personal information, or endure some tradeoff. Nonmonetary prices do not require financial expense on the part of the consumer, but do ultimately serve a financial purpose for the firm, even if indirectly. For example, consider a firm that requires a consumer to view an advertisement as a condition of receiving service and for which a third party has paid to show to that consumer. The consumer does not expend any financial resources to receive the service, yet their payment of the nonmonetary price (viewing ads) provides a financial benefit to the firm.
Price Perception

Fundamentally, price represents sacrifice (Hall and Hitch, 1939). It is what must be given up to obtain something else. But economists and marketers know that price represents much more to consumers. Price is also a cue to product quality (Rao and Monroe 1989; Völckner and Hofmann 2007) and potential risk (Bearden and Shrimp 1982; White and Truly 1989).

A number of factors influence the perception of price. The relationship between price and quality tends to be overestimated by consumers (Broniarczyk and Alba 1994). Consumers associate price with quality more as the price variation within a product category increases (Johnson and Kellaris 1988; Zeithaml 1988). Price as a cue tends to be used more heavily as the expense of the product increases (Smith and Natesan 1999).

Product familiarity has been shown as a moderating influence on price perception (Gardner 1970; Johnson and Kellaris 1988), but with that influence being context specific (Rao and Monroe 1988).

With regard to the perception of set nonmonetary prices, product familiarity has a positive influence (Dinsmore, Wright, Dugan & Arroniz 2013). Although nonmonetary prices are common, they are often product or category specific. Additionally the introduction of a nonmonetary price reduces perceptions of product risk for those who have less experience with a similar product (Dinsmore, Dugan, Wright and Arroniz 2013) and are accustomed to similar pricing.

These risk assessments play an integral role in consumer choice. Whereas some consumers select products based on the perception of greatest value (Zeithaml 1988), others view choice as the result of lowest perceived risk (Bauer 1960). Murphy and Enis (1986) conceptualized costs as having two components: everything sacrificed in the pursuit of acquiring
a product and risk. Most commonly, published studies in marketing describe two types of risk associated with a purchase: financial risk, which is inherently tied to the pricing level of the product or service, and performance risk, which is not necessarily related to price. Price has been found to reduce perceived performance risk of a product (Shrimp and Bearden 1982; White and Truly 1989), but that effect can be reversed through message framing (Peterson and Wilson 1985). As price is a cue to performance expectations (Dodds, Monroe, and Grewal 1991), the resulting assessment of that performance risk is a function of the level of information analyzed by the consumer.

Due to the role of risk perceptions as a key factor in consumer choice, particularly with newer products that frequently tend to feature nonmonetary prices, this research examines risk as a key outcome.

**Price Partitioning**

Marketing literature has extensively explored the phenomenon of partitioned pricing, which manifests itself in the marketplace in several forms. Multiple products may be bundled under one price, such as an “all inclusive” vacation where a single price covers transportation, hotel, food and more. Alternatively, a single product may have multiple, distinct components to its price for things like upgrades to a car (e.g., air conditioning, stereo, etc.) or incidentals such as shipping and handling for a product ordered online. Because consumers often process pricing information inaccurately (Dickson and Sawyer 1990; Mazumdar and Monroe 1990 1992; Stiving and Winer 1997), the manner in which a price is presented to a consumer influences judgment and product choice.
The method by which consumers process prices affects the remembered price, which ultimately influences their desire for the product (Dickson and Sawyer 1990; Monroe 1973). Partitioning incidental fees such as shipping or sales tax away from the product price reduces the perceived cost by the consumer, likely enhancing appeal of the product (Morwitz, Greenleaf, and Johnson 1998). Morowitz et al. found that the method selected to analyze multiple pricing components is the result of consumer’s motivation (or lack thereof) and effort required.

With the addition of more pricing components, consumers become more likely to rely on heuristics to reduce the cognitive burden of processing the more complex information (Hitch 1978). Such efforts to simplify come at the expense of accuracy where consumers incorrectly encode the price, often as being lower than what it really is.

The most commonly used heuristic in this process is “anchoring and adjustment” (Chapman and Johnson 1999; Tversky and Kahneman 1974), wherein consumers form an initial reference point for a price and continually move that reference point to reflect new information they’ve encountered. But consumers typically fail to make appropriate adjustments away from the anchor stimulus upon encountering new information (Jacowitz and Kahneman 1995; Lichtenstein and Slovic 1971; Tversky and Kahneman 1974; Wilson et al. 1996). So, in the case of encountering multiple price components, consumers may anchor on a focal price and fail to take the other pricing components into account. For instance, a consumer looking at shoes on the Internet may see a price of $49.99 for the shoes plus a $5.99 charge for shipping and view that pair of shoes as being cheaper than a $52.99 pair at the corner store. This, despite the fact that the total cost is lower at the corner store.

**Mental Accounting**
Richard Thaler’s model of mental accounting (1985) is an extension of Prospect Theory (Kahneman and Tversky 1979), which provides a behavioral model for loss aversion. Mental accounting establishes a framework for three phenomena: the perception of gains and losses, the attribution of those gains and losses to particular mental accounts, and the balancing of those accounts.

Of chief concern in this research are the means by which gains and losses are maximized or minimized in the minds of consumers. Thaler (1985) addresses various scenarios featuring some combination of gains and losses. Segregating losses or gains in the mind of the consumer maximizes their impact, while integrating them minimizes. As a result, firms are best served by segregating gains to maximize positive impact with consumers while integrating losses to minimize negative impact.

Thaler’s (1985) study of loss and gain perception featured scenarios where participants read financially equivalent scenarios and had to choose who they thought had the better outcome. Each scenario would feature “Mr. A” having two separate gains or losses and “Mr. B” having a single, equivalent gain or loss. One such scenario was:

“Mr. A was given tickets to lotteries involving the World Series. He won $50 in one lottery and $25 in the other. Mr. B was given a ticket to a single, larger World Series lottery. He won $75. Who was happier? Mr. A, Mr. B or no difference” (Thaler, 2008, p. 18)

In this scenario, Thaler found his theory performed as he predicted: an overwhelming majority of participants said that Mr. A—who experienced two separate gains was happier than
Mr. B who had just the one, albeit equivalent, gain. Similar scenarios detailing losses instead of gains found the reverse: two separate losses were worse than a single, equivalent gain. In the marketplace, Thaler (1980) uses credit cards as examples of integrating lots of small charges into a single loss that reduces their negative impact or value on the consumer. Algebraically, Thaler (2008) adopts Kahneman and Tversky’s value function to explain the loss integration principal as:

\[ v(-(x+y)) > v(-x) + v(-y) \]

Thaler’s formula illustrates that, although the options are mathematically equivalent, they are viewed differently. The consumer still clearly sees the singular, combined loss of, say, $10 as preferable to two separate losses of $5 each. Moreover the prices of products are not automatically coded as losses by consumers as they are functions of reference prices and relative value of the deal (Thaler 1985). Heath (1995) examined mental accounting of nonmonetary costs to the consumer such as effort and search. He cites the example of a baseball game where to attend the event a blizzard must be traversed, saying that consumers do not place the effort and expense of driving in the “baseball ticket” mental account, which is not part of the consumer’s value calculation.

But the means by which losses and gains are integrated or segregated are not purely the function of pricing. Temporal spacing (Thaler and Johnson 1990) acts as a segregating influence when gains or losses are temporally distant. Their research demonstrated that prior outcomes influence an individual’s attraction or aversion to risk so that “being ahead” in a consumer’s mental account diminished the threat of a future loss while “being behind” enhanced the appeal of break-even opportunities.
Perhaps what is most interesting and challenging about mental accounting is the process by which it is researched. As Thaler himself noted (1999) and as the literature illustrates, “we can learn about [mental accounting conventions] only by observing behavior and inferring the rules.” In other words, there are myriad means for analyzing mental accounting.

This research is concerned with the first of Thaler’s three components of mental accounting: how outcomes are perceived and experienced. Specifically, this dissertation examines how the potential losses posed by a partitioned product price affect the perceived riskiness of that product. Additionally, when different prices evoke different concerns, those varying concerns will keep those prices segregated in the mind of the consumer and elevate the product’s perceived riskiness.

**Mental Accounting of Time**

The study of mental accounting has not been limited to prices. There have been studies of the mental accounting of time. As this research will examine nonmonetary exchanges that involve some element of time, these studies are highly relevant.

Soman’s (2001) study of how time and money differ in terms of mental accounting focused on sunk costs. Specifically, in terms of monetary cost, consumers tend to fall prey to what is know as a “sunk cost effect” (Arkes and Blumer, 1985; Garland 1990; Garland and Newport, 1991; Thaler 1980)—that people pay inordinate amount of attention to previously invested money when considering whether or not to invest more money in something. This effect is a very specific application of loss aversion (Kahnemann and Tversky 1979) that gets to the heart of people’s tendency to “throw good money after bad.” An example would be holding on to a stock for too long, or perhaps even investing more money in a stock as its price continually
plummets in the hope of not losing money on the investment despite the fact that they are deepening their losses and risk in the process.

Soman found that the sunk cost effect does not apply to the investment of time, *unless* that investment of time is expressed in monetary terms (e.g., “In the four hours you took to do X, you could have made $400 working for your law firm.”) The findings suggest a “disconnect” between time and money in people’s mental accounts despite the translation of time into money being a relatively simple and common operation. At the heart of this effect is likely the concrete versus abstract nature or money versus time. Whereas financial sacrifice is easily quantifiable, time is more difficult to value. After all, some periods of time are more valuable than others.

**Hypotheses For Studies 1 & 2**

In summary of my expectations formulated on the basis of the literature on the effect of price on perceived performance risk of a product, mental accounting, and partitioned pricing, I hypothesize the following:

**H1:** Combining two (versus a single) nonmonetary prices will raise perceived risk of the product.

**H2:** Combining two monetary prices (versus a single nonmonetary price) for a product will not raise the perceived risk of the product.

**H3:** Combining a monetary and nonmonetary price will raise perceived risk versus
either a monetary or nonmonetary single price condition.

**STUDY 1A**

**Design, Participants, and Procedure**

Study 1A is designed to test hypothesis H1 concerning the effect of combining nonmonetary prices on the perceived risk of a product. A between-subjects study using three experimental conditions (Nonmonetary price: 0 vs. 1 vs. 2) where participants would read identical descriptions of the product with one of the three price conditions included in that description. The dependent measure was a three-item measure of risk (alpha = .798) where participants were asked to rate the product on a three-item, seven-point Likert scale (1=completely disagree to 7=completely agree) based on the terms “Risky,” “Uncertain,” and “Unstable,” where higher scores would reflect a higher level of perceived risk. A factor analysis of the measure revealed that all three items loaded sufficiently with each other, having loadings of .77, .94, and .90 respectively. The three items were summed to form the dependent variable of “Risk.”

An attention check was included in the questionnaire in the form of a seven-point scale where participants were asked to click the number seven. Four participants who missed the attention check or provided incomplete responses were excluded prior to the analysis of the final sample of 77 participants (42 female, 35 male). Participants were between the ages of 18 and 61 (\(M_{age} = 32.5\)) and were compensated for their participation.
The stimulus was “Chimp Camp,” a videogame that could be downloaded and played on a “smartphone” (e.g., an Internet-enabled cell phone). In the description (see Appendix 1) of the game, players assume the role of a park ranger at a chimpanzee preserve in West Africa assigned with the task of preventing the chimps from escaping the park while at the same time protecting them from poachers. The nature of the video game was constructed specifically to minimize potential biases that could occur based on age or gender that might be incurred with games of either a more violent nature or that catered to a particular demographic.

The single nonmonetary price condition was the display of advertisements and the two nonmonetary price conditions added the need to register with the game company.

**Results and Discussion**

Data were analyzed between subjects using t-tests comparing the mean differences between the zero and one nonmonetary price conditions and the one and two nonmonetary price conditions. Findings support the hypothesis (H1) of multiple nonmonetary prices degrading perception of a product due to their categorical nature and inability to be integrated by the consumer. The zero nonmonetary price condition was perceived as more risky ($M_{\text{risk}} = 10.78$) than the single nonmonetary price condition ($M_{\text{risk}} = 8.32$) ($t(1, 51) = 2.014, p < .05$ single-tailed). Perceived risk is significantly *higher* in the two nonmonetary price condition ($M_{\text{risk}} = 10.7407$) than the single nonmonetary price condition ($M_{\text{risk}} = 8.32$) ($t(1, 51) = -1.940, p < .05$ single-tailed). This supports the notion of nonmonetary prices being categorically different from each other and remaining segregated in the mind of the consumer. H1 is supported.
STUDY 1B

While study 1A examined the perception of partitioned nonmonetary prices, the purpose of Study 1B was to examine the effect of partitioned monetary prices on perceived product risk. As categorically identical prices requiring the same type of sacrifice (financial), it is anticipated prices would remain integrated in the mind of the consumer and the addition of a second monetary price would not elevate the perceived risk of the product. The between-subjects experiment resembles Study 1A with the exception of having two experimental conditions (Monetary Price: 1 vs. 2) instead of three and slight modification to the stimuli to resemble products found in the marketplace.

**Design, Participants and Procedure**

Forty-seven respondents (24 female, 23 male) between the ages of 19-59 ($M_{age} =32.5$) were recruited via Mechanical Turk and paid $.15 for their participation. Study 1B featured two experimental conditions (monetary price: 1 vs. 2) in which participants were introduced to the downloadable video game Chimp Camp, as in study 1A, but with modified verbiage. This time Chimp Camp was described as a networked game where users would play head-to-head against others online, taking the identity of the park ranger or “Mongo,” a silverback gorilla leading the chimpanzees. The reason for this modification was to provide two monetary prices that were clearly mandatory as a condition of use and the network component provided a credible means of doing that. The single monetary price condition was $.99 for the game and the double monetary price condition added a $.99 cents per month cost for access to the gaming network. The
dependent measure was the three-item measure of risk used in study 1A. After reading the service description (See Appendix 2), participants were asked a short series of questions. An attention check was included in the questionnaire where participants were presented with a seven point scale and asked to click the number seven. Five participants who either missed the attention check or provided incomplete responses were excluded from analysis, leaving the final sample size at 47.

**Results and Discussion**

The results from study 1B did not show a significant difference in mean risk perception between the one monetary price ($M_{\text{risk}} = 8.22$) to two monetary price ($M_{\text{risk}} = 7.84$) conditions ($t(1, 46) = -.291, p = .773$). Unlike study 1A, participants did not view the multiple price condition as being significantly riskier than the single price condition, suggesting they were able to integrate multiple monetary prices.

The data supports hypothesis 2 that as monetary prices are within the same category, they are more easily integrated into consumer’s mental accounts and are therefore perceived as less risky. Data suggest that the degradation of product perception is specific to at least a multiple nonmonetary price condition and potentially any two prices that are categorically different. Further, hypothesis 3 predicts that, as a monetary and a nonmonetary price are categorically different, they will evoke different concerns, remain segregated in the mind of the consumer and make a product appear riskier as a result. Study 2 was designed to test this prediction.

**STUDY 2**
The goal of study 2 is to test the hypothesized effect of combining nonmonetary prices with monetary prices. Similar to products with multiple nonmonetary prices, as the two types of prices evoke different concerns, the expectation is that these concerns will render the two prices segregated in the consumer’s mental account, thereby raising perceived risk. This study has the additional benefit of being conducted on a different sample, using a different product, and different nonmonetary price than the first study providing a conceptual replication with evidence of external validity.

**Design, Participants, and Procedure**

Eighty-nine undergraduate students (50 female, 39 male) ($M_{age}=22.7$) at a large public Midwestern university participated in the experiment in exchange for course credit. Students were used as a sample in the second experiment (versus the online panel) to provide additional evidence of external validity. While studies have shown online panels such as Amazon’s Mechanical Turk™ to be a valid sampling pool (Paolacci, Chandler & Ipeirotis 2010), the scientific merits of the service continue to be analyzed. The study was a 2 (set monetary price: free vs. $4.99) X 2 (set nonmonetary price: no rating of songs required vs. rating of songs required) between-subjects factorial design. Data were collected via the Internet using Qualtrics™ software.

Participants were asked to read a description (See Appendix 3 for descriptions) of a fictional new streaming music service named “Song Kitchen,” which “enables users to download, stream, and share music before it is available to the general public.” Participants read the same general description of the service, but were assigned randomly via Qualtrics
“Randomizer” function to one of the four conditions. The presence of a set monetary price was coded as “1” for “$4.99 per month” and “0” for “Free.” Nonmonetary prices were coded “1” for “Users must rank one song each time they log in” and “0” for no mention of a nonmonetary price. The discrepancy between specifically saying “free” and not mentioning the absence of a nonmonetary price was based on product descriptions observed in the marketplace. For example, a description of the online music service Pandora™ in the Apple “app store” (Apple 2013) has both a paid version and a “free” version. The version described as “free” does include advertisements in between songs.

A music streaming service was chosen as the stimulus for two reasons. First, similar services had received a lot of notoriety at the time with the launch of Google Music™ and Spotify™ a few months prior to data collection and was likely to be salient as a result. Secondly, these services commonly have both monetary and nonmonetary set pricing models. The approach provided both product and pricing that would be familiar enough to participants to avoid confounding factors. To confirm this assumption, participants were asked to rate on a single-item seven point scale how familiar they were with services such as Song Kitchen (1=Very Unfamiliar and 7=Very Familiar). Mean familiarity reported by the sample was 4.71 with a standard deviation of 1.82.

Additionally, an attention check was included in the questionnaire (“Click ‘strongly agree’”) and the nine participants who either missed the attention check or provided incomplete responses were excluded from analysis, leaving a final sample size of 89. The dependent measure was the same three-item measure of risk from study 1 where participants were asked to rate Song Kitchen on a seven-point Likert scale (1=completely disagree to 7=completely agree).
based on the terms “Risky,” “Uncertain,” and “Unstable,” where higher scores would reflect a higher level of perceived risk.

**Results and Discussion**

An ANOVA was conducted to analyze the effect of monetary and nonmonetary prices on the perceived risk of the product. Analysis revealed a significant interaction between monetary and nonmonetary prices \( F(1, 88) = 11.354, p < .001 \) to support the third hypothesis. Figure one illustrates the interaction.

Insert figure 1 (Appendix 4) about here

The interaction shows that the increase in perceived risk occurs in a cross-categorical pricing condition (e.g., a combined monetary and nonmonetary price) where the different evoked consideration sets segregate the losses in the mind of the consumer. This segregation in turn maximizes the impact of the losses on the consumers, thereby making the product appear riskier.

**STUDY 3**

The results of studies 1 and 2 provide evidence in support of the first three hypotheses. To better understand the driving force behind this phenomenon, I sought to find a condition under which this effect will disappear. This third experiment will be based on Hsee and Zhang’s (2010) General Evaluability Theory (GET).
At its core, GET is a theory about reference points and their impact upon determining value. Simply stated, if someone has a frame of reference for the value of something, then they will be more sensitive to differences in values between the evaluated object and its reference point. GET holds that there are three sources of reference points: having an innate knowledge of that type of object, having had previous experience with that good or object, or having two similar goods or objects being evaluated side-by-side (e.g., if it’s being evaluated jointly with another good or object).

The second proposition of GET holds that any of the three elements of the first proposition are “conjunctive,” meaning that if something is highly evaluable in either mode, knowledge or nature, it will be highly evaluable overall. For the purposes of the present research, we will examine the joint evaluation of goods with continuous and categorical differences in price. In terms of the general mechanics of joint evaluation of continuous and categorical differences in attributes, Hsee and Zhang (2010) explain it thusly (p. 346):

“The Model X Value X Knowledge interaction predicts, for example, that individuals are more sensitive to diamond size in JE than SE, but this effect is more pronounced if these individuals are diamond novices rather than diamond experts. It also predicts that people are more sensitive to the size of an apartment (an incremental difference) in JE than in SE, but their sensitivity to whether the apartment has indoor parking (a categorical difference) is relatively similar in JE and SE. [emphasis mine] Put differently, holding sensitivity to size and parking constant in JE, people in SE are more sensitive to parking than to size.”
When comparing attributes of items side-by-side, each item acts as a reference point for the other, making the evaluator more keenly aware of differences in the common or alignable attributes of the two items. If the person evaluating the item has previous experiences with similar items, those previous experiences provide a similar effect.

This theory follows research on alignable attribute differences between products. The structural alignment model of similarity (Gentner & Markman, 1997; Markman & Gentner, 1993a, 1993b) also finds that alignable (vs. nonalignable) differences are focal to evaluators in a comparative task. Additionally, comparison of alignable attributes forms stronger preferences than the comparison of nonalignable attributes (Zhang and Markman 1998).

Further, single (versus joint) evaluation has been found to lead to a “brand positivity effect” (Posavac et al. 2004), wherein people tend to rate brands more positively in isolation. This effect is rooted in selective processing. Consumers tend to rate items in isolation more highly because brands not present escape consideration (Kardes et al. 2002). Additionally, when encountering a single product to evaluate, it tends to encourage selective hypothesis testing (Sanbonmatsu et al. 1998). Combined, these factors lead us to believe that categorically different prices will be less impactful with consumers in joint evaluation mode.

**Hypotheses for Study 3**

Taking into account Hsee and Zhang’s (2010) General Evaluability Theory and foundational research on single versus joint evaluation and alignable attributes, I anticipate the following:
**H4:** Consumers jointly evaluating a good with another similar good will be more sensitive to continuous (versus categorical) differences in price (e.g., differences between two monetary prices).

**Design, Participants, and Procedure**

The purpose of Study 3 was to find a condition in which the effect revealed in the first two studies could be reversed. By putting consumers in a joint evaluatory mode for a product, we expect to be able to nullify the effect of categorical differences in price and get the consumer to instead be influenced by continual differences in price.

To test hypothesis 4, I conducted Study 3 using a 2 (Nonmonetary difference: 0 vs. 1) X 2 (Monetary difference: 0 vs. 1) X 2 (Product Familiarity: Low vs. High) between-subjects factorial experiment. 189 U.S. adults (74 Women; 115 Men; M\text{age}=29.68) took part in the experiment via online survey and were paid for their participation. Participants were randomly assigned to descriptions of two very similar video games: “Chimp Camp” and “Ape Escape.” Ape Escape carried with it a constant monetary price ($0.99) and a constant nonmonetary price (none) throughout all conditions while Ape Escape carried either the same monetary price ($0.99) or a higher price ($1.29) to create a continual difference. Additionally, whereas Ape Escape carries a constant nonmonetary price (none), Chimp Camp’s nonmonetary price was manipulated (none vs. displaying ads) to create categorical differences in price.

Following the description, subjects were asked to evaluate Chimp Camp using the same 3-item assessment of product risk as in studies 1 and 2. To assess product familiarity, participants were asked if they played video games on their Smartphone (0=No, 1=Yes), with
“No” representing the low familiarity group and “Yes” representing the high. 156 participants reported owning a smart phone and 33 participants reported not owning a smartphone. The experiment was designed in such a way that the continual and categorical differences in price would always feature the focal product (Chimp Camp) as having the higher price, so that higher risk perceptions resulting from higher prices (should they occur) would be reflected in the results. An attention check was included in the form of a seven-point scale where participants were asked to click the number 7. 11 participants who either missed the attention check or provided incomplete responses were excluded from analysis, rendering a final sample of 189.

**Results and Discussion**

Using ANOVA, the data revealed the opposite of what was predicted by GET in terms of continual differences garnering the attention of consumers when in joint evaluation mode. In joint evaluation mode, categorical differences in price affected subjects’ assessments of product risk while continual differences did not. Simple effects were found for both categorical differences in price (F(1,181)=6.473, p=.01) and product familiarity (F(1,181)=4.494, p=.04). There was no main effect found for continuous differences in price (F(1, 181)=.140, NS). Additionally, no interaction effects were found. Drilling down into the two simple effects for categorical differences in price and product familiarity, participants more familiar with smartphone games rated Chimp Camp as being more risky ($M_{Risk}=7.17$) than their less experienced counterparts ($M_{Risk}=5.79$)($t(1,187)=-1.94$, p=.05). This is in keeping with GET in that the more experienced individual was more sensitive to differences in price due to their experiential reference point. A categorical difference in price caused participants to rate Chimp Camp as riskier ($M_{Risk}=7.69$) with an additional, categorically different price, than those without it ($M_{Risk}=6.14$)($t(1,187)=-2.91$, p=.00). There was no significant difference in perceived riskiness
between prices with ($M_{\text{Risk}}=6.90$) or without ($M_{\text{Risk}}=5.95$) ($t(1,187)=.09$, NS) a continual difference in price.

The results are consistent with one component of GET, which is that a higher familiarity of with the product makes it more “highly evaluable,” and therefore makes observers more sensitive to differences. However, key to this research—how to reverse the effect found in the first two studies—remained elusive. The elevated perceived risk from combining categorically different prices found in the first two experiments was found in this study as well, even in joint evaluation mode.

That the mental accounting of categorically different prices did not conform to General Evaluability Theory could be the result of several things. First, and I believe most likely, although the difference in monetary price was significant on a percentage basis (43.5%), the difference was still only the matter of thirty cents. That increment may have been too insignificant to trigger the desired effect. Monetary prices are encoded generally as “cheap” or “expensive,” (Monroe & Lee, 1999). In that context, subjects could have encoded the price for both products either as “cheap” or “less than a buck.” Re-running the same experiment with larger monetary pricing differences should help determine if the third in this program of studies represents an exception to GET or just a boundary condition.

The results of study three may have suffered from the choice of risk as dependent variable. Choice, rather than a perceived attribute like risk, may be a preferable dependent measure, as choice may be the composite result of several perceived attributes. And while mental accounting has been studied in a wide variety of ways, choice and behavior have been the most common dependent variables. Perceived risk may fluctuate depending on the configuration of categorically similar and/or dissimilar prices, but it could be that other attributes drive the
ultimate behavior (e.g. selection and choice) to a greater extent. The extent to which perceived risk drives this behavior could also particular to the product type, context or other factors.

Additionally, there are some alternative theoretical possibilities for identifying the mediating conditions of the effects found in this research. Incommensurate compensation (Nunes and Park 2003) holds that diminishing sensitivity (Kahneman and Tversky 1979) is eliminated when people are comparing a monetary item with a nonmonetary item. While the nonmonetary item has some monetary value, the fact that the item is one step removed from money, renders incomparable in the mind of the consumer. This finding is certainly relevant to this research, exactly to what extent requires study.

Equity theory (Adams 1965; Homans 1961) examines the perception of inequity in the allocation of resources. In the context of pricing, equity theory examines peoples’ perceptions of and reactions to what they believe to be a fair exchange—the balance between what is sacrificed and what is obtained. Perceived equity and fairness in the exchange could very well be a moderating or mediating force on perceived risk or choice.

Limitations

The studies had certain constraints which limited the ability to generalize the findings. The products and services were lower-end consumer products—a smartphone video game and an online music service. Although these are indicative of the types of products that could include either monetary or nonmonetary prices, other types of products may produce different effects. Additionally, the stimuli were merely text descriptions of a product which is not necessarily
indicative of how consumers truly encounter products such as these. In the instance of video games, in the “app store” the user would likely see screen captures of the games, user reviews and other information, which would likely also impact perceived risk to potentially limiting or eliminating the perceptual effects of these partitioned prices on those perceptions. Visual elements can (and often will) overwhelm verbal elements. However as, even within the same category of mobile video games, there will likely be a significant variability in how have are presented. To isolate the effect of these prices on consumer inferences, a text description is a valid if imperfect experimental stimulus.

**Ideas for future research**

Future research in this area could include empirical studies of product adoptions with various monetary and nonmonetary pricing schema. This research examined two types of nonmonetary prices (ads, song rating) but other types of nonmonetary prices exist such as sharing personal information, registering, agreeing to “free” services and more. Each type of nonmonetary price may carry its own specific properties that influence consumers. Additionally, other inferences on these partitioned prices, such as quality, would be of interest. Quality, while a similar attribute to performance risk, is still distinct and worthy of analysis. Further, many nonmonetary prices carry with them some sacrifice of privacy and inferences related to privacy concerns would be valuable.

Some nonmonetary prices are explicit and others are merely implied. For instance, consumers of mainstream services such as Google Search and Facebook know that they are being served advertisements, but frequently find out later that their personal information is being
used in other ways (Sarno, 2011). Other products such as smartphone applications, both “free” and paid, collect consumer information without the consumer’s knowledge or permission (Lunden, 2012). There may be sharp differences in mindsets and consequent behavior between situations in that nonmonetary prices are explicitly stated and known versus situations in which consumers are completely unaware or merely suspicious of the existence of a nonmonetary price. This issue could also be influenced by an endowment effect (Thaler 1980) or escalating commitment (Cialdini 1985) wherein a consumer already using a product or service could be less sensitive to the realization of the price for a product already in their possession.

**Conclusion**

The importance of nonmonetary prices in business is likely to grow over time with the continued proliferation of online services. In particular, as news, entertainment and other content becomes devalued via online sharing (Foremsky 2009), the ability of many businesses to charge monetary prices for their offerings decreases while the need to invoke nonmonetary prices increases. This is on display in what was traditionally known as the “print news media,” where a great many businesses are in a period of experimentation invoking nontraditional pricing models. These include monetary prices, nonmonetary prices, micro-pricing, “pay what you like,” crowdsource funding or any combination of these. As such organizations innovate their revenue models, they do so at the risk of affecting how their product or service is perceived.

The goal of the third study was to find conditions under which businesses can neutralize the threats to their product perception posed by this “cross-categorical pricing” effect by presenting a product jointly with another. Although unsuccessful here, the determination of a
mediator of this effect could greatly assist businesses seeking to invoke pricing models that include both monetary and nonmonetary prices.
REFERENCES


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Paolacci, Gabriele, Chandler, Jesse and Ipeirotis, Panagiotis G., Running Experiments on Amazon Mechanical Turk (June 24, 2010). Judgment and Decision Making, Vol. 5, No. 5, 411-419


APPENDIX 1: Experimental Conditions of “Chimp Camp” For Study 1A

Condition: 1 Nonmonetary Price

PLEASE READ THE PASSAGE CAREFULLY TO ANSWER THE QUESTIONS THAT FOLLOW

Chimp Camp™ is a networked video game where users compete against others "online." It is available for play on “smart phones” including iPhone®, BlackBerry® and Droid®.

Chimp Camp takes place in a chimpanzee sanctuary located in the jungles of Congo in West Africa. Players can take one of two roles in the game to compete against others online:

· Ranger Bob, manager of the preserve, or
· Mongo, a silver-backed gorilla that leads the chimps in trying to escape.

As Ranger Bob, your challenges include:

· Keeping the monkeys from escaping by building (and
rebuilding) fences that the chimps continuously tear down
· Protecting the chimps from outside poachers and leopards trying to sneak in to the preserve
· Picking enough bananas to keep the chimps fed (A hungry chimp is an angry chimp—and an angry chimp works a lot harder to escape.)

As Mongo, your challenges include:
· Helping your fellow primates tear down preserve fences
· Raiding Ranger Bob's refrigerator and lunch box when he's not looking
· Setting traps to slow down Ranger Bob in his repair of the fence

The game displays ads while being played and is suitable for any age group.
Chimp Camp™ is a networked video game where users compete against others "online." It is available for play on “smart phones” including iPhone®, BlackBerry® and Droid®.

Chimp Camp takes place in a chimpanzee sanctuary located in the jungles of Congo in West Africa. Players can take one of two roles in the game to compete against others online:

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- Protecting the chimps from outside poachers and leopards trying to sneak in to the preserve
- Picking enough bananas to keep the chimps fed (A hungry chimp is an angry chimp—and an angry chimp works a lot harder
As Mongo, your challenges include:

- Helping your fellow primates tear down preserve fences
- Raiding Ranger Bob's refrigerator and lunch box when he's not looking
- Setting traps to slow down Ranger Bob in his repair of the fence

The game is available for download for registered users, displays ads while being played and is suitable for any age group.
APPENDIX 2: Experimental Conditions of “Chimp Camp” For Study 1B

Condition: 1 Monetary Price

PLEASE READ THE PASSAGE CAREFULLY TO ANSWER
THE QUESTIONS THAT FOLLOW

Chimp Camp™ is a networked video game where users compete against others "online." It is available for play on “smart phones” including iPhone®, BlackBerry® and Droid®.

Chimp Camp takes place in a chimpanzee sanctuary located in the jungles of Congo in West Africa. Players can take one of two roles in the game to compete against others online:

- Ranger Bob, manager of the preserve, or
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As Mongo, your challenges include:
· Helping your fellow primates tear down preserve fences
· Raiding Ranger Bob's refrigerator and lunch box when he's not looking
· Setting traps to slow down Ranger Bob in his repair of the fence

The game can be downloaded for a one-time cost of ninety-nine cents ($0.99) and is suitable for any age group.
Chimp Camp™ is a networked video game where users compete against others "online." It is available for play on “smart phones” including iPhone®, BlackBerry® and Droid®.

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- Picking enough bananas to keep the chimps fed (A hungry chimp is an angry chimp—and an angry chimp works a lot harder
As Mongo, your challenges include:

· Helping your fellow primates tear down preserve fences
· Raiding Ranger Bob's refrigerator and lunch box when he's not looking
· Setting traps to slow down Ranger Bob in his repair of the fence

The game can be downloaded for a one-time cost of ninety-nine cents ($.99), costs an additional ninety-nine cents ($.99) per month to access the network and is suitable for any age group.
Chimp Camp™ is a networked video game where users compete against others "online." It is available for play on “smart phones” including iPhone®, BlackBerry® and Droid®.

Chimp Camp takes place in a chimpanzee sanctuary located in the jungles of Congo in West Africa. Players can take one of two roles in the game to compete against others online:

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· Setting traps to slow down Ranger Bob in his repair of the fence

The game can be downloaded for a one-time cost of ninety-nine cents ($0.99) and is suitable for any age group.
APPENDIX 3: Description of “Song Kitchen”

Control Condition (No Price)

SongKitchen™ is a music sharing service that enables users to download, stream and share music before it is available to the general public. Through the SongKitchen™ website, users can hear new music from established and up-and-coming artists throughout a variety of genres including rock, hip-hop, country, R&B and more. Users can recommend songs to their friends and receive suggestions for songs based on their preferences.

SongKitchen™--Hear what your favorite artists are cooking up.

1 Nonmonetary, 0 Monetary Price Condition

SongKitchen™ is a music sharing service that enables users to download, stream and share music before it is available to the general public. Through the SongKitchen™ website, users can hear new music from established and up-and-coming artists throughout a variety of genres including rock, hip-hop, country, R&B and more. Users can recommend songs to their friends and receive suggestions for songs based on their preferences.
The service is available for free but users are required to rate (via three question survey) at least one song each time they access the service.

SongKitchen™--Hear what your favorite artists are cooking up.

0 Nonmonetary, 1 Monetary Price Condition

SongKitchen™ is a music sharing service that enables users to download, stream and share music before it is available to the general public. Through the SongKitchen™ website, users can hear new music from established and up-and-coming artists throughout a variety of genres including rock, hip-hop, country, R&B and more. Users can recommend songs to their friends and receive suggestions for songs based on their preferences.

The service is available for $4.99 per month.

SongKitchen™--Hear what your favorite artists are cooking up.

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throughout a variety of genres including rock, hip-hop, country,
R&B and more. Users can recommend songs to their friends and
receive suggestions for songs based on their preferences.

The service is available for $4.99 per month and users are
required to rate (via three question survey) at least one song each
time they access the service.

SongKitchen™--Hear what your favorite artists are cooking up.
Figure 1: Effects of Set Monetary and Nonmonetary Prices on Perceived Risk
APPENDIX 5: Descriptions of Chimp Camp and Ape Escape in Joint Evaluatory Mode

No Continual Difference, No Categorical Difference

PLEASE READ THE PASSAGE CAREFULLY TO ANSWER THE QUESTIONS THAT FOLLOW ABOUT "CHIMP CAMP"

Chimp Camp™ and Ape Escape™ are very similar video games available for play on “smart phones” including iPhone®, BlackBerry® and Droid®.

In both games, the player assumes the role of a park ranger in charge of the sanctuary where monkeys live.

As park ranger, you have lots of challenges that include:

· Keeping the monkeys from escaping by building (and rebuilding) fences that the chimps continuously tear down
· Protecting the monkeys from outside poachers and leopards trying to sneak in to the preserve
· Picking enough bananas to keep the chimps fed (A hungry monkey is an angry monkey—and an angry monkey works a lot
harder to escape.)

Ape Escape and Chimp Camp are both 99 cents to download. Both are suitable for any age group.
No Continual Difference, With a Categorical Difference

PLEASE READ THE PASSAGE CAREFULLY TO ANSWER THE QUESTIONS THAT FOLLOW ABOUT "CHIMP CAMP"

Chimp Camp™ and Ape Escape™ are very similar video games available for play on “smart phones” including iPhone®, BlackBerry® and Droid®.

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· Protecting the monkeys from outside poachers and leopards trying to sneak in to the preserve
· Picking enough bananas to keep the chimps fed (A hungry monkey is an angry monkey—and an angry monkey works a lot harder to escape.)
Ape Escape is 99 cents to download. Chimp Camp is 99 cents to download and displays advertisements at the bottom of the screen while being played. Both are suitable for any age group.
Continual Difference, No Categorical Difference

Chimp Camp™ and Ape Escape™ are very similar video games available for play on “smart phones” including iPhone®, BlackBerry® and Droid®.

In both games, the player assumes the role of a park ranger in charge of the sanctuary where monkeys live.

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· Protecting the monkeys from outside poachers and leopards trying to sneak in to the preserve
· Picking enough bananas to keep the chimps fed (A hungry monkey is an angry monkey—and an angry monkey works a lot harder to escape.)

Ape Escape is 69 cents to download. Chimp Camp is 99 cents to download. Both are suitable for any age group.
Chimp Camp™ and Ape Escape™ are very similar video games available for play on “smart phones” including iPhone®, BlackBerry® and Droid®.

In both games, the player assumes the role of a park ranger in charge of the sanctuary where monkeys live.

As park ranger, you have lots of challenges that include:

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- Protecting the monkeys from outside poachers and leopards trying to sneak in to the preserve
- Picking enough bananas to keep the chimps fed (A hungry monkey is an angry monkey—and an angry monkey works a lot harder to escape.)
Ape Escape is 69 cents to download. Chimp Camp is 99 cents to
download and
displays advertisements at the bottom of the screen while being
played. Both are suitable for any age group.
APPENDIX 6: ANOVA Tables & T-tests for Study 3

Analysis of Full Model

## Between-Subjects Factors

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<td>Chimp and Ape Cost the Same</td>
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<td>Chimp is more expensive</td>
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<td>96</td>
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<tr>
<td>Chimp Plays Ads, Ape Does Not</td>
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<tr>
<td>CatDiff 0</td>
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<tr>
<td>OwnPhone 0</td>
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</tr>
<tr>
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</tr>
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<td>Type III Sum of Squares</td>
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a. R Squared = .075 (Adjusted R Squared = .040)
T-Test of Product Familiarity Effect

### Group Statistics

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<th>Mean</th>
<th>Std. Deviation</th>
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### Independent Samples Test

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<th>t-test for Equality of Means</th>
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<tr>
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<td>Sig.</td>
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<td>Chimp and Ape Cost the Same</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chimp Plays Ads, Ape Does Not</td>
<td></td>
</tr>
<tr>
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<td>F</td>
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61
### T-Test of Categorical Difference Effect

#### Group Statistics

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<th>Std. Error Mean</th>
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</thead>
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#### Independent Samples Test

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<td>Sig.</td>
<td>t</td>
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<tr>
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## T-Test of Continuous Difference Effect

### Group Statistics

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<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chimp and Ape Cost the Same</td>
<td>97</td>
<td>6.9485</td>
<td>3.48022</td>
<td>.35336</td>
</tr>
<tr>
<td>Chimp is more expensive</td>
<td>92</td>
<td>6.9022</td>
<td>3.99191</td>
<td>.41619</td>
</tr>
</tbody>
</table>

### Independent Samples Test

<table>
<thead>
<tr>
<th>Risk</th>
<th>Levene's Test for Eq. of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Conf. Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
<td>t</td>
</tr>
<tr>
<td>Equal var.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>assumed</td>
<td>.462</td>
<td>.498</td>
<td>.085</td>
</tr>
<tr>
<td>Equal var. not assumed</td>
<td>.085</td>
<td>180.551</td>
<td>.933</td>
</tr>
</tbody>
</table>

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