THE EFFECTS OF THEMATIC VERSUS TAXONOMIC CATEGORIZATION ON CHOICE OVERLOAD WHEN CHOOSING UNIVERSITY CLASSES

BY

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THESIS

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Abstract

The problem of “having too much choice” within our everyday lives is magnified in online environments. This study looked at the effects of thematic categorization on the problem of choice overload by categorizing an undergraduate course catalog either by taxonomic categorization, thematic categorization, or no categorization. Surprisingly the three different types of categorization did not affect choice overload measures. Theoretical and practical implications are discussed.
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1. Introduction

A phrase that might be heard on a college campus during class registration period is, “Hey! What class are you going to take?” For individuals that have gone through selecting elective courses during undergraduate studies, many have most likely experienced the dilemma of how to figure out what elective courses to take. Although most course catalog systems at higher education institutions are readily available online to facilitate class selection, the sheer number of classes available at most colleges makes it a formidable task to filter through these listings. As an example of how large this choice set can get, for a spring 2014 course catalog listing at the University of Illinois at Urbana/Champaign, there were over 4,900 classes listed to choose from.

A substantial body of literature looks at the effects of having large sets to choose from and how this affects the choice process for individuals. This body of literature includes the effects of categorization (Mogilner, Rudnick, & Iyengar, 2008) as well as types of categorization (Poynor & Diehl, 2007) on choice overload. Many studies have looked at the effects of reducing the amount of choice available, but this study is one of the few that looked at the situation in which one cannot reduce the amount of choice in a set. This study utilized the environment of a university course catalog in which students choose elective courses from. This is an environment in which classes cannot be removed, thus this study investigated means of reducing choice overload without reducing the amount of choice. This study aimed to build on top of Poynor and Diehl’s (2007) study that found that categorizing assortments thematically rather than taxonomically created a greater perception of similarity between choices within the assortment. Poynor Lamberton and Diehl (2013) suggested that future research should be conducted to test whether these categorization effects on perceived similarity could reduce choice overload. This
study thus built on prior studies and tested Poynor Lamberton and Diehl’s (2013) suggestion of future research. Additionally, Mogilner, Rudnick, and Iyengar (2008) found that merely categorizing a large choice set without reducing the amount of choice reduced choice overload. This study built on their research as well as I tested to see if mere categorization effects hold true over multi-layered online environments of choice such as a course catalog system.

1.1. Literature Review

1.1.1. The Choice Overload Effect

The potential problems of the growing amount of information and options to parse through is identified in literature and studies utilizing various terms such as information overload (Beaudoin, 2008; Hiltz & Turoff, 1985), information load (Malhotra, 1982), the problem of too much choice (Scheibehenne, Greifeneder, & Todd, 2009), or the tyranny of choice (Chok & Brozyna, 2011; Fasolo, McClelland, & Todd, 2007). This study utilizes the phrase “choice overload” as mentioned in much consumer research literature, which states, “although the provision of extensive choices may sometimes still be seen as initially desirable, it may also prove unexpectedly demotivating in the end” (Iyengar & Lepper, 2000, p. 996). Iyengar and Lepper (2000) found that when consumers shopping in a grocery store were presented with the ability to sample jams from a booth containing six varieties versus another booth containing twenty-four varieties, although 60% of the consumers who sampled jam stopped at the high variety booth versus 40% stopping at the low variety booth, only 3% who sampled the high variety booth jams purchased jam versus 30% of those who sampled from the low variety booth. Interestingly, we can see from the results of their study that consumers seemed to prefer the allure of a large assortment size, but were less motivated to purchase when choosing from a large
assortment. This effect was tested again by Iyengar and Lepper (2000) in further lab studies where participants were randomly assigned to a large choice set of thirty Godiva chocolates, a small choice set of six chocolates, or a condition upon which a choice was made for them, and the participants with the larger choice set rated their satisfaction with their final choice as lower. The participants that were given no choice (a choice was made for them) rated their satisfaction with their choice lower than both the large and small choice set. Ratings of frustration with the choice process and difficulty of the choice process were also higher in the larger choice set compared to the smaller, but interestingly a rating of enjoyment of the choice process was higher in the larger choice set compared to the smaller choice set. This measure of enjoyment with the choice process was clearly a result that seems to conflict with the other measures. The researchers explain though that participants may be allured by the opportunity of more choice and may be excited for the opportunity of having more choice, but they may also feel much more responsible for their choices in the larger choice set, and this may result in frustration with the process, difficulty with the process, and lower satisfaction with their final choice. Although this explanation does have merit, it should be noted though that there is the potential for conflicting results with regards to measuring various affect measures for the process of choosing. Overall though, these studies show that there is a threshold upon which giving consumers more choice actually lessens their ability to easily choose, lowers their satisfaction with a choice, and produces more frustration with the choice process.

Subsequent research tested whether prior preferences affected choice situations (Chernev, 2003). Participants were given either a condition where they were presented with four chocolates or sixteen chocolates. Participants were randomly put into either a treatment group in which they were asked to articulate ideal chocolate preferences (referred to as an articulated ideal point) or
were not asked to articulate any preferences. For their manipulation, the attributes of chocolates that made up an ideal point were the chocolate type, cocoa content, flavor, and nut content. Their hypothesis was that for participants that were asked to articulate an ideal point, the impact of choice overload effects would be moderated. At the end of the experiments, participants were allowed to either choose a small box containing two chocolates identical to the ones they chose during the experiment, or to choose a box of two of the most popular chocolates from a popular chocolate brand, Godiva. Choice overload was assessed via whether participants switched from their choice of chocolate from the experiment to the popular choice of chocolates presented at the end of the experiment, thus indicating their overall displeasure towards their chocolate choice made during the experiment. When participants were not forced to articulate an ideal point, 9% of participants in the four chocolate condition switched at the end of the experiment to the popular brand of chocolates versus 38% of participants in the sixteen chocolate condition. Thus, presenting more options in this case seemed to cause less satisfaction towards chocolates that were chosen in the larger assortment size condition for participants without an articulated ideal point. For participants that did articulate an ideal point, no choice overload effects were found. The study explains that having to form an ideal point while simultaneously searching for a preferred choice makes choosing much more difficult, and having an ideal point simplifies choice. It should be noted that the utilization of “switching behavior” at the end of the experiment as a measure of choice overload may introduce additional variables that may actually not be measuring choice overload, such as whether or not the “popular choice” of chocolates at the end of the experiment was indeed popular or even well known by the participants, as well as the potential for other motivators for why participants decided to switch to a different type of chocolate. Overall though for participants without articulated ideal points, a smaller choice set
was connected to a greater desire to retain their chosen chocolate, and thus contributes to the potential of a certain threshold upon which choice becomes negatively affected by a growing assortment size. Thus, choice overload effects were confirmed.

A more recent study also found choice overload effects in a study where they asked participants to choose a camcorder for a co-worker who had pre-defined preferences, and those preferences were scaled across four attributes (weight, resolution, memory, and zoom) (Diehl & Poynor, 2010). Participants were randomly assigned to treatment conditions, and participants in the limited choice condition were given a catalog of eight camcorder options while the participants in the extensive choice condition were given a catalog of thirty-two camcorder options. Once again, results sided towards the existence of choice overload as subjective ratings of choice overload were significantly higher for the participants with catalogs that had thirty-two camcorder options versus the participants that had eight. Additionally, participants were less satisfied with their choice when choosing from thirty-two camcorder options versus participants choosing from eight. The researchers argue that choice overload occurs due to larger choice sets causing individuals to have higher expectations with regards to finding a good choice; whether or not individuals find an acceptable choice in the larger choice set, their higher expectations cause them to be less satisfied than those with a smaller choice set. As a whole, these studies along with numerous additional studies have confirmed the existence of choice overload when larger assortment sizes degraded peoples’ ability to choose, and produced negative effects with regards to the process of choosing (Chok & Brozyna, 2011; Iyengar, Wells, & Schwartz, 2006; Johns, Edwards, & Hartwell, 2013; Sellier, & Dahl, 2011; Wise, & Pepple, 2008).

Although various researchers have identified choice overload effects in their studies, Scheibehenne, Greifeneder, and Todd (2010) conducted a meta-analysis of sixty-three conditions
from fifty published and unpublished experiments (N=5,036) and found a mean effect size across all studies of almost zero, but this was with substantial variance between the studies within the meta-analysis. This has brought much focus on whether or not choice overload effects indeed exist. Chernev, Bockenholt, and Goodman (2010) responded to this meta-analysis identifying flaws in Scheibehenne, Greifeneder, and Todd’s (2010) argumentation and methods, such as their oversight as to many of the studies purposely creating conditions upon which they were attempting to reverse the choice overload effect compared to a condition exhibiting choice overload effects, and thus simply averaging data points would cause, not surprisingly, an effect of zero within those studies. Additionally, Chernev, Bockenholt, and Goodman (2010) state, “Analysis will benefit more from a focus on identifying conditions in which choice overload is likely to occur rather than simply on whether it occurs across all conditions” (p. 428).

1.1.2. Factors of Choice Overload

Various factors have been identified and tested in this problem of too much choice. As mentioned, previous research has shown that varying assortment size was a moderator of choice overload (Chernev, 2003; Diehl & Poynor, 2010; Iyengar & Lepper, 2000). In addition to the moderator of assortment size, additional moderators include familiarity (Haynes, 2009; Iyengar & Lepper, 2000), making a decision for self versus others (Polman, 2012), time pressure (Haynes, 2009), and categorization (Mogilner, Rudnick, & Iyengar, 2008).
1.1.2.1. Familiarity

Although not always necessarily explicitly pointed out and mentioned in past research studies, the factor of familiarity was addressed in various ways throughout many studies. Iyengar and Lepper (2000) controlled for familiarity by choosing a category in which most consumers would be familiar with, but not highly familiar with the product of choice. They state, “careful attention was given to selecting a product with which most consumers would be familiar, yet not so familiar that preferences would already be firmly established” (p. 997). Thus it seems that the study used a product that was in the range of somewhere between low to moderate familiarity, and choice overload effects were found to exist in this state.

Haynes (2009) tested undergraduate students with an assortment that contained drawings for prizes of which they would most likely be unfamiliar with, such as a massage treatment at a spa or a hot air balloon ride, thus making sure familiarity was at a low level throughout the study. Although their main study was measuring how decision time interacts with assortment size with regards to choice overload, they believed that utilizing unfamiliar options would make processing information more complex. They found that decision time did affect certain measures of choice overload, but once again the assumption of this study was that unfamiliar choices were necessary to measure choice overload. Thus it seems to be assumed that having a low level of familiarity may be necessary for choice overload to occur.

Inbar, Botti, and Hanko (2011) factored in prior preferences in a choice overload study in which they utilized stimuli (DVDs) that was only recently released on Amazon.com. Although the study’s main manipulation was the effects of feeling rushed while making a choice between and large choice set of forty-five DVDs versus a small choice set of fifteen DVDs, and subsequent choice overload effects (participants feeling rushed exhibited choice overload, but
not feeling rushed did not exhibit choice overload), the study controlled for prior preferences by choosing only DVDs recently released on Amazon.com. Although they did not specifically mention familiarity, controlling for prior preferences by utilizing newly released DVDs seems to be highly related to the concept of attempting to create a set of unfamiliar choices. It should be noted though that just because a DVD is newly released on Amazon.com, there is the potential that individuals would still recognize the movie title due to the normal process of movies first being released in public theaters and then being released to DVD. In a previous study, choice overload effects were found utilizing stimuli that potentially were highly familiar to the participants, namely “a group of popular DVDs arranged on a table in front of them (examples include “Crash,” “Brokeback Mountain,” “The Matrix,” and “The Breakfast Club”)” (p. 2). They found that measures of regret were higher for those put in a large set condition of thirty DVDs versus those that were put into a small set condition of five DVDs, as well as participants felt more rushed in the large set condition versus the small set condition. Although familiarity was not specifically measured, these results are notable due to the potential for the stimuli to be highly familiar, and this study still exhibiting potential choice overload effects.

Scheibehenne, Greifeneder, and Todd (2010) write in their meta-analysis of choice overload studies, “experiments on choice overload have typically used options that decision makers are not very familiar with to prevent strong prior preferences for a specific option and consequently a highly selective search process that would allow participants to ignore most of the assortment.” (p. 410) Aggregating this past research, low familiarity seems to be assumed as a necessary pre-condition for the exhibition of choice overload effects, but there were mixed results, with some choice overload effects even in conditions of potential high familiarity (Inbar, Botti, & Hanko, 2011).
1.1.2.2. Decision for Self versus Others

More recent research proposed that individuals that are making a decision for their own selves are in a prevention focus, while individuals making decisions for others are in a promotion focus (Polman, 2012). This research showed that choice overload occurs for those making decisions for themselves, but the effect was reversed for those making decisions for others. Customers at two wine stores were surveyed with two questions that were counterbalanced. The first question was whether they were buying wine for themselves or for someone else, and the second was a question on how satisfied they were with their purchase. Results showed that customers who purchased wine for themselves experienced more satisfaction when shopping at the smaller store versus the larger store, however when customers were purchasing wine for others, customers experienced more satisfaction when shopping at the larger store versus the smaller store. The study explains that this difference is due to participants who choose for others as being in a promotion focus condition, thus desiring to reduce errors of omission. For participants that chose for themselves, they were explained to most likely be in a prevention focus, thus desiring to reduce errors of commission. These findings seem to contradict Diehl and Poynor’s (2010) study of which participants were asked to choose a camcorder for their co-workers. The study found choice overload effects for larger choice sets compared to smaller choice sets when choosing for another individual. Interestingly neither study controlled for familiarity, which may have factored into the contradicting results.

1.1.2.3. Time Given to Make a Decision

Recent research has shown that time given to make a decision interacts with assortment size with regards to measures of choice overload (Haynes, 2009). This study looked at
assortment size (ten vs. three prize options) and decision time (five vs. two minutes).

Undergraduates were randomly assigned to conditions, and were asked to make a choice to be entered into a drawing for one of many prizes worth $100; it was assumed that each prize was something that an undergraduate student would not normally be familiar with having to decide on (a hot air balloon ride, a limousine ride with VIP passes to a night club, a party in a luxury suite hotel, etc.). Participants were found to have more frustration with choosing and less satisfaction with their final choice when choosing from the large assortment size versus the smaller assortment size, thus exhibiting the same choice overload effects from assortment size changes as I have previously mentioned. With regards to the main effect of time given to make a decision, participant satisfaction with choice was significantly lower when they were given less time to make a decision. Interestingly though, there was no interaction effect for satisfaction with choice between assortment size and time given to make a decision. The study attributes the occurrence of choice overload to the increased complexity of the decision that comes from having a larger assortment set, as well not having enough time required to utilize choice elimination heuristics to simplify the decision. Thus we note that giving participants enough time to make a decision seems to be necessary for the reduction of choice overload.

1.1.2.4. Categorization

Mogilner, Rudnick, and Iyengar (2008) found that “mere categorization” (the mere presence of any sort of categorization) acted as a moderator of choice overload. Participants were approached within a food court of a local university, and were given menus with a listing of fifty gourmet coffees. Four versions of the menus were made available of which the first had no categories and all fifty coffees were listed in no specific order, the second split the fifty coffees
into ten categories that were informative (complex, spicy, dark roast, mild, etc.), the third split the fifty coffees into ten categories that were somewhat informative (the hut, the coffee house, Lola’s, etc.), and the fourth split the fifty coffees into ten categories that were completely uninformative (category a, category b, category c, etc.). Their results showed that chooser satisfaction for preference-constructing participants (participants that did not identify themselves as frequent coffee drinkers or having expertise in selecting coffees) that were given the menu with no categories was significantly lower than the preference-constructing participants that received the menus with informative, somewhat informative, and uninformative categories. Notably, the three categories did not significantly differ from one another. Thus for preference constructors, the mere presence of any categorization helped reduce choice overload. They explained that this could be due to categories helping choosers discern differences in large choice sets while still allowing them to perceive variety. For preference matching participants (participants that did identify themselves as frequent coffee drinkers or having expertise in selecting coffees), the mere presence of categories did not affect satisfaction with choice. Although they did not specifically speak of familiarity, if preference constructing and matching were measured by whether or not participants were frequent coffee drinkers and/or whether or not they had expertise in the realm of selecting coffees, it seems logical to believe that preference constructors are generally unfamiliar with choosing coffee, and preference matchers are generally familiar with choosing coffee. Thus, it seems that for participants that had a low level of familiarity with choosing coffee, mere categorization (of any type) heightened satisfaction, whereas for those highly familiar with choosing coffee, no change in satisfaction with choice was found between categorizing and not categorizing. It should be noted that the various menus looked quite different visually, and thus this could have contributed as a factor within the study.
Overall, in a condition of low familiarity, categorization of any sort should help reduce the impact of choice overload.

Past research has shown that organizing assortments differently has affected perceived variety of the assortment (Hoch, Bradlow, & Wansink, 1999). Poynor and Diehl (2007) looked at the differences between structuring categories based on thematic versus taxonomic categorization. They stated that thematic categories are “formed in terms of higher-level, generally abstract connections among items” (p. 53). They posited that due to thematic categorization’s higher relational processing when compared to taxonomic categorization, individuals would perceive heightened similarity between items presented within a thematic category versus a taxonomic category. They defined thematic categorization as, “thematic groupings are formed in terms of higher-level, generally abstract connections among items” (p. 53), and taxonomic categorization as, “taxonomic categories, by contrast, present items in highly intuitive groups” (p. 53). They conducted a study in which New Age drinks were selected as the stimuli and sixteen drinks were categorized either taxonomically by four brands (Sobe, Tazo, Arizona, and Vitamin Water) or thematically by four thematic categories (Tension Tamers, Brain Boosters, All-Day Stamina, and Wake-Me Ups). Participants (undergraduate business students) were randomly assigned to the thematic category condition or the taxonomic category condition, and for the first week all participants filled out a survey to establish baseline brand strength amongst other measures. Starting from the subsequent week, participants (undergraduate business students) visited the lab once a week for four weeks to choose a drink from their assigned category condition. Amongst various measures taken, participants were asked to allocate points to each of the brands “by assigning a total of 100 points across the four brands, in a manner similar to that described in Kahn, Moore, and Glazer (1987)” (p. 62). They stated that
if participants perceived brands to be more similar, they would distribute points more evenly across the four brands, resulting in low variance. When analyzing point allocation variance, their results showed that the categorization of thematic versus taxonomic had significant effects towards perceived similarity in which thematic categorization produced more perceived similarity (less point allocation variance) versus taxonomic categorization (greater point allocation variance). Additionally, this did not significantly change over the course of the four weeks, and there was no interaction between category structure and time. They mentioned a potential connection with choice overload in stating, “some consumers may fear that choosing from high-variety assortments will be overwhelming (Chernev, 2006). For these consumers, a decrease in perceived variety caused by the thematic structures could actually make a thematically-structured assortment more attractive than a taxonomically organized set” (p. 66).

An important note about these results is that the researchers believed these New Age drinks were an unfamiliar arena of choice for the participants, stating, “Though, of the general population, this age group does consume energy drinks in general more often than others, use of these particular products in the general market is still not extremely widespread. Therefore, the stimulus set allows us to analyze changes in brand strength for a relatively unfamiliar but highly competitive, emerging product category” (Poynor & Diehl, 2007, p. 61). In testing for familiarity with this product category, they did indeed confirm that the product category was unfamiliar to participants. Thus, their results were achieved testing participants that were generally unfamiliar with the choice domain from which they were choosing.

More recent research identified a similar effect with regards to perceived similarity, but this time according to benefit-based assortment organization versus attribute-based assortment organization (Poynor Lamberton & Diehl, 2013). The study identified that perceived similarity
between assortments categorized according to product benefits would be higher when compared to the same assortments categorized according to product attributes. Implications to choice overload can be made from this study as the study states, “For these consumers, an increase in perceived similarity could actually increase the attractiveness of benefit-based over attribute-based organizations” (Poynor Lamberton & Diehl, 2013, p. 405).

1.1.3. Definition of Thematic and Taxonomic Categorization

While utilizing taxonomies or themes could prove to be potentially important ways of categorizing, one challenge with utilizing thematic or taxonomic categorization is getting clarification for the definitions in the previously mentioned research study (Poynor & Diehl, 2007). Poynor and Diehl (2007) somewhat defined thematic categorization as, “thematic groupings are formed in terms of higher-level, generally abstract connections among items” (p. 53), and taxonomic categorization as, “taxonomic categories, by contrast, present items in highly intuitive groups” (p. 53). Utilizing the taxonomic definition as an example, this would require all participants to consider brand names of energy drinks as highly intuitive groups. These definitions seem to have a high potential to cause confusion, thus more extensively defining taxonomic and thematic as terms is important before using these constructs in testing.

Lin and Murphy (2001) defined a taxonomic category as “a hierarchical system in which concepts are differentiated into levels of varying specificity (e.g., animal, dog, collie) related by class inclusion” (p. 3), as well as a thematic category as “the external or complementary relations among objects, events, people, and other entities that co-occur or interact together in space and time” (p. 3). Estes, Golonka, and Jones (2011) write in line with this class concept of taxonomic categorization as they state that taxonomic relations allow people to treat non-identical items as
similar, thus enabling people to interact with certain objects like bananas and apples as similar within taxonomic relations to one another, through taxonomic categories such as food or fruits. Taxonomic categorization thus has to do with internal characteristics within a single entity providing a common category based on those internal shared characteristics, such as a cat having whiskers, a tail, and two pointed ears. On the other hand, Estes, Golonka, and Jones (2011) also write in line with Lin and Murphy’s (2001) complementary relations concept of thematic relations by explaining that things are related thematically if they play a complementary role in the same event or same scenario, such as cows and milk playing a role within a production theme. Thus, thematic categorization has to do with external relations that occur across various objects, events, concepts, or even people, such as a restaurant theme of a waiter, plate, and bill. Therefore, thematic relations must occur between two or more things, as well as well as they must fulfill differing roles within their theme. Estes, Golonka, and Jones (2011) write, “Among the most typical thematic relations are spatial (e.g., JUNGLE and BIRD), temporal (e.g., SUMMER and HOLIDAY), causal (e.g., WIND and EROSION), functional (e.g., FORK and KNIFE), possessive (e.g., POLICE and BADGE), and productive relations (e.g., COW and MILK)” (p. 252). A course catalog contains a choice set of numerous classes, and classes are meant to teach students skills and knowledge to help them accomplish their educational goals. Utilizing functionally thematic categories to organize courses fits nicely with the purpose of educational courses as students can utilize the knowledge learned in courses to functionally achieve their goals.

1.1.4. Utilizing a Course Catalog to Analyze Choice Overload Effects

As mentioned in the introduction, utilizing a university course catalog system filled with real class data to test choice overload seems to be an ideal place to test for choice overload
effects, especially due to the fact that it is a highly naturalistic environment, it is an environment with a high probability that an individual is choosing classes for themselves (Polman, 2012), and is a natural environment where time given to make a decision is as long as a participant may desire to have (Haynes, 2009). A course catalog is also an interesting arena in which to test choice overload since what constitutes a large choice set for a course catalog is far greater than any of the aforementioned studies. In the case of this study’s course catalog, the amount of classes available to choose from was greater than three hundred and fifty classes. As mentioned previously, most choice overload studies have looked at situations in which removing choice helped reduce choice overload, but this is a case where choice (university courses) cannot be removed, thus other manipulations are needed to attempt to reduce choice overload.

Mogilner, Rudnick, and Iyengar (2008) found that merely categorizing a large choice set without reducing the amount of choice reduced choice overload. Their manipulation though was on single sheet menus of coffee, while this study tested whether or not mere categorization still holds true on a multi-tier course catalog site, thus furthering research in this area. This is potentially important since most online environments of choice have multiple layers of navigation with regards to choice rather than a single page of options. Additionally, Poynor Lamberton and Diehl (2013) suggested that future research should be conducted to test whether categorization effects on perceived similarity could reduce choice overload. This study also followed their suggestion to test whether or not thematically categorizing a course catalog could reduce choice overload, thus furthering choice overload research in this way as well.

Research has shown that low familiarity of choice sets is potentially a necessary pre-condition for choice overload effects to be experienced (Chernev, 2003; Iyengar & Lepper, 2000; Mogilner, Rudnick, & Lepper, 2008). Considering categorization in line with Mogilner,
Rudnick, and Iyenger’s (2008) study, it is expected that if familiarity is controlled for, categorizing course catalog classes will cause less choice overload than when classes are not categorized at all.

_Hypothesis 1a:_ There should be a relationship between mere categorization and frustration, controlling for familiarity. People should indicate more frustration when choosing from uncategorized courses than from categorized courses.

_Hypothesis 1b:_ There is a relationship between mere categorization and ease of choosing, controlling for familiarity. People should indicate less ease when choosing from uncategorized courses than from categorized courses.

_Hypothesis 1c:_ There is a relationship between mere categorization and satisfaction, controlling for familiarity. People should indicate less satisfaction when choosing from uncategorized courses than from categorized courses.

_Hypothesis 1d:_ There is a relationship between mere categorization and likelihood to register, controlling for familiarity. People should indicate a lower likelihood to register for their chosen courses when choosing from uncategorized courses than from categorized courses.

Research has found that a specialized categorization type of thematically-based categorization increased ratings of perceived similarity compared to taxonomic categorization for
those that were unfamiliar with the choice set presented to them (Poynor & Diehl, 2007). Thus it is expected that when controlling for familiarity, participants will perceive classes to be more similar to each other when browsing a course catalog that is categorized thematically compared to participants that browse a course catalog that is categorized taxonomically.

*Hypothesis 2:* There should be a relationship between type of categorization (thematic vs. taxonomic) and perceived similarity between courses, controlling for familiarity. People should indicate less perceived similarity between courses when choosing from taxonomically categorized courses than from thematically categorized courses.

Mogilner, Rudnick, and Iyengar (2008) found that between different categorization schemes (informative, somewhat informative, and completely uninformative categorization structures), there was no effects of choice overload, thus potentially pointing to types of categorization as not being a moderator of choice overload effects. Other research though has identified a specialized categorization type of thematically-based categorization increased ratings of perceived similarity compared to taxonomic categorization for those that were unfamiliar with the choice domain (Poynor & Diehl, 2007). Poynor Lamberton and Diehl (2013) stated that perceived similarity might potentially moderate the effects of choice overload. Thus, it is hypothesized that if familiarity is controlled for, participants will experience less choice overload when browsing classes that are categorized thematically compared to participants that browse classes that are categorized taxonomically.
Hypothesis 3a: There should be a relationship between type of categorization (thematic vs. taxonomic) and frustration, controlling for familiarity. People should indicate more frustration when choosing from taxonomically categorized courses than from thematically categorized courses.

Hypothesis 3b: There should be a relationship between type of categorization (thematic vs. taxonomic) and ease of choosing, controlling for familiarity. People should indicate less ease when choosing from taxonomically categorized courses than from thematically categorized courses.

Hypothesis 3c: There should be a relationship between type of categorization (thematic vs. taxonomic) and satisfaction, controlling for familiarity. People should indicate less satisfaction when choosing from taxonomically categorized courses than from thematically categorized courses.

Hypothesis 3d: There should be a relationship between type of categorization (thematic vs. taxonomic) and likelihood to register, controlling for familiarity. People should indicate a lower likelihood to register for their chosen courses when choosing from taxonomically categorized courses than from thematically categorized courses.

Synthesizing the aforementioned research and comparing the presence of categorization with the types of categorization, it is hypothesized that if familiarity is controlled for, participants in the thematic course catalog will experience less choice overload than participants in the
taxonomic course catalog, and both will experience less choice overload than participants in the no category course catalog.

_Hypothesis 4a_: There should be a relationship between all categorization (thematic vs. taxonomic vs. no category) and frustration, controlling for familiarity. People should indicate more frustration when choosing from taxonomically categorized courses than from thematically categorized courses, and the most frustration when choosing from uncategorized courses.

_Hypothesis 4b_: There should be a relationship between all categorization (thematic vs. taxonomic vs. no category) and ease of choice, controlling for familiarity. People should indicate less ease when choosing from taxonomically categorized courses than from thematically categorized courses, and the least ease when choosing from uncategorized courses.

_Hypothesis 4c_: There should be a relationship between all categorization (thematic vs. taxonomic vs. no category) and satisfaction, controlling for familiarity. People should indicate less satisfaction when choosing from taxonomically categorized courses than from thematically categorized courses, and the least satisfaction when choosing from uncategorized courses.

_Hypothesis 4d_: There should be a relationship between all categorization (thematic vs. taxonomic vs. no category) and likelihood of registering, controlling for familiarity. People should indicate less likelihood to register for their chosen courses when choosing
from taxonomically categorized courses than from thematically categorized courses, and the least likelihood to register for their chosen courses when choosing from uncategorized courses.

*Hypothesis 4e:* There should be a relationship between all categorization (thematic vs. taxonomic vs. no category) and perceived similarity between courses, controlling for familiarity. People should indicate less perceived similarity between courses when choosing from taxonomically categorized courses than from thematically categorized courses, and the least perceived similarity between courses when choosing from uncategorized courses.
2. Method

2.1. Pre-Test

Because familiarity and interest were potential moderators (Chernev, 2003; Inbar, Botti, & Hanko, 2011; Iyengar & Lepper, 2000; Mogilner, Rudnick, & Iyengar, 2008), a pre-test was conducted to select only moderately familiar and moderately interesting category titles amongst both the taxonomic and thematic categorization. All the courses that were selected for this study were elective courses pulled out of the University of Illinois Urbana Champaign Spring 2014 course database. The algorithm of the university registrar determined the definition of a “true undergraduate elective course”, but it involved making sure that all courses were available to all undergraduate years and majors, there were no pre-requisites, and there were no restrictions. Once those classes were filtered and selected by subject, taxonomic categorization (e.g. Advertising, Informatics, History) was already in place for those classes. The number of taxonomic categories that were associated with the true elective courses was 220 taxonomic categories, thus, 220 thematic categories (e.g. Enjoying Drama, Running a Business, Understanding Labor Rights) for the same courses were created to match the number of taxonomic categories.

Participants for the pre-testing of categories were 92 undergraduate students chosen by snowball sampling from five different undergraduate groups. Five surveys were created with a mix of 44 taxonomic and thematic categories, of which made up all 220 categories. Each survey asked for participants to rate each category title using 10-point Likert scales for “interesting-ness” and familiarity (1=Boring, 10=Interesting; and 1=Unfamiliar, 10=Familiar). Five groups of undergraduates were chosen to each fill out one of the five survey groups (this was an execution mistake, it is a known limitation, and it is explained in more detail within the limitations section).
Results from the surveys were aggregated together and means were calculated for the ratings of “interesting-ness” and familiarity. Results from both Likert scales followed a normal distribution, and due to the study’s desire to eliminate highly (un)interesting and highly (un)familiar category titles, all outliers that were more than two standard deviations away from the group were removed. If a thematic category was removed due to familiarity or interest, courses that were originally assigned to that thematic category were then moved to other thematic categories that pre-tests showed were only moderately familiar and moderately interesting. For example, the thematic category, “Learning to Program Computers” was rated highest with regards to interest and was more than two standard deviations away from the rest of the group of both taxonomic and thematic categories. Thus, this thematic category was removed from the main study, and all the courses that originally were under this thematic category were assigned to various other thematic categories that were only moderately familiar and moderately interesting. If a taxonomic category was removed due to familiarity or interest, the underlying classes were completely removed from the study due to not wanting to actually change actual course data since taxonomic categorization is built into the numeric identifier of courses. An example of this was the taxonomic category of “Computer Science”. This category was rated as one of the most familiar categories as well as more than two standard deviations from the group of thematic and taxonomic categories with regards to familiarity. Thus the taxonomic category of “Computer Science” was removed from the main study as well as all courses that had the identifier of CS in the course number. Changing the course identifiers (changing CS100 to XX100) could have been potentially detrimental to a student who may have looked to this course catalog for real class data. After all removals, 390 true elective courses remained, and 96 thematic and taxonomic categories remained.
2.2. Participants

Participants were 191 undergraduate students at the University of Illinois Urbana Champaign. Participants were randomly assigned to a course catalog, and were allowed to browse the course catalog from any device, from any location, and for any length of time. This was to allow for a more naturalistic choice environment that was very close to how students would normally browse classes, as well as giving them enough time to prevent time pressure from affecting choice overload (Haynes, 2009). A total of forty-two participants were dropped due to an analysis of IP addresses that showed that there were many instances where multiple entries were received from the same IP. Although this could have been caused by multiple people utilizing the same laptop, lab computer, or device to browse the catalog and complete the experiment, these multiple entries from the same IP addresses were all dropped to control for the case that any participant mistakenly (or intentionally) completed the study multiple times. Additionally, three participants were not able to select a course, thus were removed from analysis as well as one more participant indicating in their comments that they felt they should not be included in the analysis. This left a total of 145 students (taxonomic n=48; thematic n=51; no category n=46). All participants were undergraduate students ranging from freshmen to fifth year seniors, and all students received extra-credit for participation in the study.

Undergraduates were chosen from this study as opposed to graduate students due to the potential that undergraduates may be a different enough participant population than graduate students with regards to how they may go about selecting courses. Additionally, there are far more undergraduate true elective courses available compared to graduate elective courses, and due to the nature of this study with regards to choice overload, undergraduates were considered the best choice. Additionally, although there has been debate as to whether utilizing college
populations in experiments was appropriate with regards to ecological validity, this study’s design required the use of college students to test choice overload in a highly naturalistic environment.

2.3. Design

This study utilized a one-way between subjects experimental design with three levels. The no-category catalog was not categorized at all and listed all the courses on the main page with links to course details (see Appendix A for example). The taxonomic catalog was categorized by course subject (e.g. Asian American Studies, Latin), with links to the listing of courses within each category, and each course link led to the appropriate course details (see Appendix A for example). The thematic catalog was categorized by functionally thematic themes (e.g. Becoming a Politician, Enjoying Nature), with links to the listing of courses within each category, and each course link led to the appropriate course details (see Appendix A for example). All comparisons were conducted on the same large set size of 389 classes, which is different than most previous studies as there is no smaller set of choices upon which the larger set is being compared to. Rather, the change in choice overload was tested utilizing the moderator of categorization, controlling for familiarity. Participants reported how many semesters they have utilized a course catalog, which was then used as this study’s measure of familiarity.

2.4. Stimuli

Three separate course catalog websites were created for this study, of which were categorized either taxonomically by subject (the vast majority of university courses catalogs are categorized by), thematically by functional theme (e.g. Enjoying Music, Learning about Insects,
Understanding Human Behavior), or not categorized at all. Each course catalog was made to look visually similar and simple, with a fully white background and standard hyperlink colors, so as not to distract participants from the task of the study. The course catalog was structurally made to look similar to the official campus course catalog, but the campus catalog does differ by additional functionality (e.g. a search box) and font/color variations throughout. Thus the course catalogs for the study should have been moderately familiar when compared to participants’ experiences with the official campus course catalog. The specific courses and course details were the same across all three course catalog conditions. At the top and bottom of each course catalog page, instructions were given as follows: “Registration for Spring 2014 UIUC classes begins in early November. Please look through this course catalog below and find an elective course that you would be interested in taking next semester. Once you have made your selection (or if you decide not to make a selection after spending some time searching), please click on the following survey link to finish this experiment.” As mentioned in the pre-test, the taxonomic and thematic course catalogs had a total of 96 categories listed on the main index page, and the no categorization course catalog had 390 links presented on the index page (see Appendix A for images of each course catalog). Google Analytics was enabled behind each site for every page to gain additional data as to how participants were utilizing the sites.

2.5. Measures

After browsing the course catalog, participants entered demographic information and rated choice overload through a survey. With regards to demographics, participants were asked for their year in school. To measure familiarity, participants were asked how many semesters they have used a course catalog to choose courses. To rate choice overload, participants were asked six questions on 10-point Likert scales. Satisfaction (Dar-Nimrod, Rawn, Lehman, &
Schwartz, 2009; Diehl & Poynor, 2010; Haynes, 2009; Iyengar & Lepper, 2000; Iyengar, Mogilner, Rudnick, & Iyengar, 2008; Wells, & Schwartz, 2006; Polman, 2012) was measured by how satisfied they were with the class that they ultimately chose (1=Not at all satisfied, 10=Extremely satisfied). Only three participants were not able to select a course across all three sites, so these three were removed from analysis. Ease of choice (Scheibehenne, Greifeneder, & Todd, 2009) was measured (1=Not at all easy, 10=Extremely easy) as well as likelihood that they would actually register for the course (or courses) that was selected from the course catalog was measured (1=Not at all likely, 10=Extremely likely). How frustrated (Haynes, 2009; Iyengar & Lepper, 2000) they felt when attempting to make a choice was also measured (1=Not at all frustrated, 10=Extremely frustrated). Lastly, they were asked to rate how similar (Mogilner, Rudnick, Iyengar, 2008; Poynor & Diehl, 2007; Poynor Lamberton & Diehl, 2013; Scheibehenne, Greifeneder, & Todd, 2009) they felt the classes were to each other (1=Not similar at all, 10=Very similar). Familiarity with the course catalog format was also asked (1=Not at all familiar, 10=Extremely familiar), but this measure was not used due to reasons that are explained in the limitations section. See Appendix B for sample questionnaire.

2.6. Procedure

The study was conducted in the 2013 fall semester during the month of October to mirror the time period that the actual university course catalog was made available to students in preparation of spring semester course registration. Courses that were included in this study were actual spring 2014 classes, but only true undergraduate elective courses were selected for this study. The university registrar created the algorithm that defined what courses were true electives, but it included courses that were available to all undergraduates, that had no pre-requisites, and had no restrictions.
Participants were randomly assigned to one of the three course catalogs and were provided a link to the course catalog that they were assigned to. Participants were specifically asked to choose a course for themselves due to previous findings that indicate that choosing for another person (rather than oneself) reversed the effects of choice overload (Polman, 2012). Participants were able to browse the catalog for as long as they wanted in order to control for potential interference with time pressure effects on choice overload (Haynes, 2009) and they could return to the site to browse as many times as they wanted; this was to maintain a naturalistic feeling to the course catalog environment. When their search for elective classes was completed, participants filled out the survey by following the link available. This link was on every page of the course catalog to ensure they could exit at any point. After completing the survey, participants were given extra credit for their participation.

2.7. Analysis

An ANCOVA across the three levels was conducted with familiarity as the covariate. Once again, familiarity was measured by asking participants how many semesters they had used a course catalog to choose courses. The relationship between categorization types was analyzed with familiarity controlled for as a covariate. Planned contrasts were conducted to assess the effects of mere categorization as well as thematic versus taxonomic categorization.
3. Results

3.1. Power Analysis

Scheibehenne, Greifeneder, and Todd (2010) estimated effect sizes for various choice overload studies in their meta-analysis, and found that the choice overload studies that they analyzed had estimated effect sizes ranged from $-1.89 < d < 1.21$. Of the 63 effect sizes that they estimated, 28 were in the range of $-0.20 < d < 0.09$, and of those 28 that showed choice overload effects, seven were in the range of $0.02 < d < 0.09$. For studies that were accessible (many studies that their meta-analysis analyzed were unpublished works), after post-hoc power analysis, the majority of them showed to have power greater than or equal to .9. There were studies though that found effects even amidst very low power, such as Fasolo, Carmeci, and Misuraca’s (2009) referenced study showing power equal to .06. Thus the range of estimated effect sizes for choice overload in their study varied greatly, and this affected study power levels.

Due to the wide range of effect sizes estimated for choice overload and lack of reporting actual effect sizes, there was difficulty in estimating appropriate sample size to achieve power greater than or equal to .9. Specifically, the mere categorization and thematic versus taxonomic literature did not report actual effect sizes (Poynor & Diehl, 2007; Mogilner, Rudnick, & Iyengar, 2008), making it hard to estimate appropriate sample size for a properly powered study. A power analysis revealed lack of power across the study, thus indicating the possibility for type II error. All power measurements are reported.

3.2. Mere Categorization Testing

All of hypotheses 1a through 1d were testing the effects of categorization (categorized versus not categorized) on choice overload measures with familiarity controlled for as a covariate. Refer to Table 1 for all categorization effects of choice overload with familiarity
controlled for as a covariate. Refer to Table 2 for familiarity as a covariate and its relationship with choice overload measures. Refer to Table 3 for planned contrast testing of mere categorization on choice overload.

Hypothesis 1a: There should be a relationship between mere categorization and frustration, controlling for familiarity. People should indicate more frustration when choosing from uncategorized courses than from categorized courses.

The covariate, familiarity, was not related to frustration, $F(1, 141) = 3.40, p = .07, r = .15, 1-\beta = .45$. There was also no effect of all categorization (no category, taxonomic, and thematic) on frustration after controlling for familiarity, $F(2, 141) = .94, p = .39, \text{partial } \eta^2 = .01, 1-\beta = .21$. Planned contrasts revealed that merely categorizing courses did not affect frustration compared to having no categorization at all, $t(141) = .98, p = .33, r = .08$. Thus, hypothesis 1a was not supported.

Hypothesis 1b: There is a relationship between mere categorization and ease of choosing, controlling for familiarity. People should indicate less ease when choosing from uncategorized courses than from categorized courses.

The covariate, familiarity, was not related to ease of choice, $F(1, 141) = 1.02, p = .31, r = .08, 1-\beta = .17$. There was also no effect of all categorization (no category, taxonomic, and thematic) on ease of choice after controlling for familiarity, $F(2, 141) = 1.16, p = .32, \text{partial } \eta^2 = .02, 1-\beta = .25$. Planned contrasts revealed that merely categorizing courses did not affect ease of
choice compared to having no categorization at all, $t(141) = -1.18$, $p = .24$, $r = .10$. Thus, **hypothesis 1b was not supported.**

**Hypothesis 1c**: There is a relationship between mere categorization and satisfaction, controlling for familiarity. People should indicate less satisfaction when choosing from uncategorized courses than from categorized courses.

The covariate, familiarity, was related to satisfaction, $F(1, 141) = 5.09$, $p = .03$, $r = .19$, $1-\beta = .61$. There was no effect though of all categorization (no category, taxonomic, and thematic) on satisfaction after controlling for familiarity, $F(2, 141) = 1.50$, $p = .23$, partial $\eta^2 = .02$, $1-\beta = .32$. Planned contrasts revealed that merely categorizing courses did not affect satisfaction compared to having no categorization at all, $t(141) = -1.20$, $p = .23$, $r = .10$. Thus, **hypothesis 1c was not supported.**

**Hypothesis 1d**: There is a relationship between mere categorization and likelihood to register, controlling for familiarity. People should indicate a lower likelihood to register for their chosen courses when choosing from uncategorized courses than from categorized courses.

The covariate, familiarity, was not related to registration likelihood, $F(1, 141) = 1.33$, $p = .25$, $r = .10$, $1-\beta = .21$. There was also no effect of all categorization (no category, taxonomic, and thematic) on registration likelihood after controlling for familiarity, $F(2, 141) = .30$, $p = .74$, partial $\eta^2 = .00$, $1-\beta = .10$. Planned contrasts revealed that merely categorizing courses did not
affect registration likelihood compared to having no categorization at all, \( t(141) = -.30, p = .76, r = .03 \). **Thus, hypothesis 1d was not supported.**

### 3.3. Thematic versus Taxonomic Testing

Hypothesis 2 was assessed looking at the effects of types of categorization (thematic versus taxonomic) with familiarity controlled as a covariate. Refer to Table 1 for all categorization effects of choice overload with familiarity controlled for as a covariate. Refer to Table 2 for familiarity as a covariate and its relationship with choice overload measures. Refer to Table 4 for planned contrast testing of type of categorization on choice overload.

**Hypothesis 2:** There should be a relationship between type of categorization (thematic vs. taxonomic) and perceived similarity between courses, controlling for familiarity. People should indicate less perceived similarity between courses when choosing from taxonomically categorized courses than from thematically categorized courses.

The covariate, familiarity, was not related to perceived similarity, \( F(1, 141) = 1.05, p = .31, r = .09, 1-\beta = .17 \). There was also no effect of all categorization (no category, taxonomic, and thematic) on perceived similarity after controlling for familiarity, \( F(2, 141) = .30, p = .74, \) partial \( \eta^2 = .00, 1-\beta = .10 \). Planned contrasts revealed that thematic categorization did not affect perceived similarity compared to taxonomic categorization, \( t(96) = .04, p = .97, r = .00 \). **Thus, hypothesis 2 was not supported.**

Hypothesis 3a through 3d were assessed looking at the effects of types of categorization (thematic versus taxonomic) with familiarity controlled as a covariate. Refer to Table 1 for all
categorization effects of choice overload with familiarity controlled for as a covariate. Refer to Table 2 for familiarity as a covariate and its relationship with choice overload measures. Refer to Table 4 for planned contrast testing of type of categorization on choice overload.

**Hypothesis 3a:** There should be a relationship between type of categorization (thematic vs. taxonomic) and frustration, controlling for familiarity. People should indicate more frustration when choosing from taxonomically categorized courses than from thematically categorized courses.

The covariate, familiarity, was not related to frustration, $F(1, 141) = 3.40, p = .07, r = .15, 1-\beta = .45$. There was also no effect of all categorization (no category, taxonomic, and thematic) on frustration after controlling for familiarity, $F(2, 141) = .94, p = .39$, partial $\eta^2 = .01$, $1-\beta = .21$. Planned contrasts revealed that thematic categorization did not affect frustration compared to taxonomic categorization, $t(96) = -.97, p = .34, r = .10$. **Thus, hypothesis 2 was not supported.**

**Hypothesis 3b:** There should be a relationship between type of categorization (thematic vs. taxonomic) and ease of choosing, controlling for familiarity. People should indicate less ease when choosing from taxonomically categorized courses than from thematically categorized courses.

The covariate, familiarity, was not related to ease of choice, $F(1, 141) = 1.02, p = .31, r = .08, 1-\beta = .17$. There was also no effect of all categorization (no category, taxonomic, and
thematic) on ease of choice after controlling for familiarity, $F(2, 141) = 1.16$, $p = .32$, partial $\eta^2 = .02$, $1-\beta = .25$. Planned contrasts revealed that thematic categorization did not affect ease of choosing compared to taxonomic categorization, $t(96) = -.99$, $p = .32$, $r = .10$. Thus, hypothesis 3b was not supported.

Hypothesis 3c: There should be a relationship between type of categorization (thematic vs. taxonomic) and satisfaction, controlling for familiarity. People should indicate less satisfaction when choosing from taxonomically categorized courses than from thematically categorized courses.

The covariate, familiarity, was related to satisfaction, $F(1, 141) = 5.09$, $p = .03$, $r = .19$, $1-\beta = .61$. There was no effect though of all categorization (no category, taxonomic, and thematic) on satisfaction after controlling for familiarity, $F(2, 141) = 1.50$, $p = .23$, partial $\eta^2 = .02$, $1-\beta = .32$. Planned contrasts revealed that thematic categorization did not affect satisfaction compared to taxonomic categorization, $t(96) = -1.23$, $p = .22$, $r = .12$. Thus, hypothesis 3c was not supported.

Hypothesis 3d: There should be a relationship between type of categorization (thematic vs. taxonomic) and likelihood to register, controlling for familiarity. People should indicate a lower likelihood to register for their chosen courses when choosing from taxonomically categorized courses than from thematically categorized courses.
The covariate, familiarity, was not related to registration likelihood, $F(1, 141) = 1.33, p = .25, r = .10, 1-\beta = .21$. There was also no effect of all categorization (no category, taxonomic, and thematic) on registration likelihood after controlling for familiarity, $F(2, 141) = .30, p = .74$, partial $\eta^2 = .00, 1-\beta = .10$. Planned contrasts revealed that thematic categorization did not affect registration likelihood compared to taxonomic categorization, $t(96) = -.74$, $p = .46, r = .08$. Thus, hypothesis 3d was not supported.

3.4. Thematic versus Taxonomic versus No Category Testing

Hypothesis 4a through 4d were assessed looking at the effects of all types of categorization (thematic versus taxonomic versus no categorization) with familiarity controlled as a covariate. Refer to Table 1 for all categorization effects of choice overload with familiarity controlled for as a covariate. Refer to Table 2 for familiarity as a covariate and its relationship with choice overload measures.

*Hypothesis 4a: There should be a relationship between all categorization (thematic vs. taxonomic vs. no category) and frustration, controlling for familiarity. People should indicate more frustration when choosing from taxonomically categorized courses than from thematically categorized courses, and the most frustration when choosing from uncategorized courses.*

The covariate, familiarity, was not related to frustration, $F(1, 141) = 3.40, p = .07, r = .15, 1-\beta = .45$. There was also no effect of all categorization (no category, taxonomic, and thematic) on frustration after controlling for familiarity, $F(2, 141) = .94, p = .39$, partial $\eta^2 = .01, 1-\beta = .21$. Thus, hypothesis 4a was not supported.
Hypothesis 4b: There should be a relationship between all categorization (thematic vs. taxonomic vs. no category) and ease of choice, controlling for familiarity. People should indicate less ease when choosing from taxonomically categorized courses than from thematically categorized courses, and the least ease when choosing from uncategorized courses.

The covariate, familiarity, was not related to ease of choice, \( F(1, 141) = 1.02, p = .31, r = .08, 1-\beta = .17 \). There was also no effect of all categorization (no category, taxonomic, and thematic) on ease of choice after controlling for familiarity, \( F(2, 141) = 1.16, p = .32, \text{ partial } \eta^2 = .02, 1-\beta = .25 \). Thus, hypothesis 4b was not supported.

Hypothesis 4c: There should be a relationship between all categorization (thematic vs. taxonomic vs. no category) and satisfaction, controlling for familiarity. People should indicate less satisfaction when choosing from taxonomically categorized courses than from thematically categorized courses, and the least satisfaction when choosing from uncategorized courses.

The covariate, familiarity, was related to satisfaction, \( F(1, 141) = 5.09, p = .03, r = .19, 1-\beta = .61 \). There was no effect though of all categorization (no category, taxonomic, and thematic) on satisfaction after controlling for familiarity, \( F(2, 141) = 1.50, p = .23, \text{ partial } \eta^2 = .02, 1-\beta = .32 \). Thus, hypothesis 4c was not supported.

Hypothesis 4d: There should be a relationship between all categorization (thematic vs. taxonomic vs. no category) and likelihood of registering, controlling for familiarity. People
should indicate less likelihood to register for their chosen courses when choosing from
taxonomically categorized courses than from thematically categorized courses, and the least
likelihood to register for their chosen courses when choosing from uncategorized courses.

The covariate, familiarity, was not related to registration likelihood, \( F(1, 141) = 1.33, p = .25, r = .10, 1-\beta = .21 \). There was also no effect of all categorization (no category, taxonomic, and thematic) on registration likelihood after controlling for familiarity, \( F(2, 141) = .30, p = .74, \) partial \( \eta^2 = .00 \), 1-\( \beta \) = .10. **Thus, hypothesis 4d was not supported.**

Hypothesis 4e: There should be a relationship between all categorization (thematic vs.
taxonomic vs. no category) and perceived similarity between courses, controlling for familiarity.
People should indicate less perceived similarity between courses when choosing from
taxonomically categorized courses than from thematically categorized courses, and the least
perceived similarity between courses when choosing from uncategorized courses.

The covariate, familiarity, was not related to perceived similarity, \( F(1, 141) = 1.05, p = .31, r = .09, 1-\beta = .17 \). There was also no effect of all categorization (no category, taxonomic, and thematic) on perceived similarity after controlling for familiarity, \( F(2, 141) = .30, p = .74, \) partial \( \eta^2 = .00 \), 1-\( \beta \) = .10. **Thus hypothesis 4e was not supported.**

Although not specifically covered by any hypotheses, participant familiarity with the
course catalog format (which was not used as the measure of familiarity due to reasons that are explained in the limitations section) was related to the covariate of familiarity (semesters that
participants have used the course catalog system), $F(1, 141) = 20.06, p = .00, r = .35, 1-\beta = .99$.

There was also a significant effect of all categorization (no category, taxonomic, and thematic) on familiarity with the course catalog format after controlling for familiarity (semesters that participants have used the course catalog system), $F(2, 141) = 4.23, p = .02$, partial $\eta^2 = .06$, $1-\beta = .73$. 
4. Discussion

4.1. General Discussion

4.1.1. Lack of Expected Mere Categorization Effects

The goal of this research was to explore the effects of categorization on an extremely large assortment of classes, tested in the naturalistic environment of a course catalog system. My first hypothesis was to test the effects of the mere presence of categorization on choice overload, which research has shown that by simply categorizing a choice set (no matter what the categorization system is), choice overload is reduced (Mogilner, Rudnick, & Iyengar, 2008). My manipulation differed from Mogilner, Rudnick, and Iyengar (2008) in that their stimuli was a one page menu of choice, whereas my manipulation was a series of online pages in which each selection would take you to a deeper page within the course catalog. With familiarity controlled for, there was no relationship between mere categorization and measures of choice overload. This could potentially be due to the fact that this study in essence was testing relative choice overload of a static number of choices versus the majority of all other studies testing choice overload when the number of choices is changed. The fact that my manipulation involved many tiers of online pages of choice compared to Mogilner, Rudnick, and Iyengar’s (2008) study, and the fact that the choice set was held static, all of these factors could have contributed to the lack of expected results found.

4.1.2. Lack of Expected Categorization Effects on Perceived Similarity

My second hypothesis dealt with the effects of looking at the differences between two specific types of categorization for the course catalogs, namely taxonomic (e.g. Asian American Studies, Latin) and thematic categorization (e.g. Becoming a Politician, Enjoying Nature).
Poynor and Diehl (2007) found that participants perceived New Age drinks (Sobe, Tazo, Arizona, and Vitamin Water) to be more similar when categorized thematically versus taxonomically. With familiarity controlled for, I expected that thematic categorization would increase perceived similarity between courses compared to taxonomic categorization. With familiarity controlled for though, there was no relationship found between type of categorization (thematic versus taxonomic) and perceived similarity. This could have been due to the fact that the terms “thematic” and “taxonomic” were not fully defined by Poynor and Diehl (2007). They defined thematic categorization as, “thematic groupings are formed in terms of higher-level, generally abstract connections among items” (p. 53), and taxonomic categorization as, “taxonomic categories, by contrast, present items in highly intuitive groups” (p. 53). Thus what I considered “generally abstract” for thematic categorization, or “highly intuitive” for taxonomic categorization, may have been different than what they considered generally abstract or highly intuitive. According to my attempts to more fully define “thematic” and “taxonomic” categorization, it seems that these types of categorization did not affect perceptions of similarity.

4.1.3. Lack of Expected Categorization Effects on Choice Overload

My third hypothesis dealt again with the effects of looking at the differences between taxonomic and thematic categorization. Poynor and Diehl (2007) suggested that an increase in perceived similarity may “make a thematically-structured assortment more attractive than a taxonomically organized set” (p. 66). I wanted to actually test this due to their suggestion of the potential of future research with regards to this manipulation. Thus I hypothesized that an increase in perceived similarity would decrease choice overload. Thus, I expected that with familiarity controlled for, thematic categorization (as opposed to taxonomic categorization)
would decrease choice overload. With familiarity controlled for, there was no relationship found between type of categorization (thematic versus taxonomic) and measures of choice overload. The fact that I found no difference in perceived similarity between thematic and taxonomic categorization in my second hypothesis most likely affected the third hypothesis significantly. Thus again, according to my attempts to more fully define “thematic” and “taxonomic” categorization, it seems that these types of categorization for a course catalog also did not affect choice overload.

4.1.4. Lack of Expected All Categorization Effects on Choice Overload

My fourth and last hypothesis was a synthesis of the mere categorization effect (Mogilner, Rudnick, & Iyengar, 2008) and the effects of thematic versus taxonomic categorization (Poynor & Diehl, 2007). I expected that with familiarity controlled for, thematic categorization (as opposed to taxonomic categorization) would decrease choice overload, and both would decrease choice overload compared to uncategorized courses. With familiarity controlled for, there was no relationship between all types of categorization and choice overload. This lack of expected results follows the lack of results from both the mere categorization testing as well as the type of categorization testing. The difference in manipulation of mere categorization compared to Mogilner, Rudnick, and Iyengar’s (2008) study, the fact that the number of choices was held static, and the potential difference in defining thematic and taxonomic categorization all most likely contributed to the lack of expected results.
4.1.5. Familiarity Effect on Satisfaction with Choice and Familiarity with the Course Catalog Format

Although not predicted by the hypotheses, familiarity was significantly related with participant satisfaction with their final choice. These results demonstrate the importance of familiarity on this choice overload. As mentioned in my literature review, familiarity was considered as influencing choice overload effects, but in past research familiarity was either not measured or was potentially measured differently across studies. Iyengar and Lepper (2000) accounted for familiarity, but did not specifically measure for familiarity. Rather, they indicated that they carefully chose an item that they assumed would be familiar, but not too familiar. They chose Wilkin & Sons jams, of which they assumed was moderately familiar to participants. They conducted their study in a real store, with research assistants dressed up as store employees, and utilized booths that had differing quantities of these jams. Due to the naturalistic setting on their study and their desire for participants to be unaware that they were being studied, it was probably almost impossible to pre-test for familiarity. Nonetheless this could have affected their results for choice overload. Poynor and Diehl (2007) also assumed that their stimuli (Tazo, Sobe, Arizona, and Vitamin Water) were generally an unfamiliar product category for undergraduate business students. This is another case in which familiarity was not measured, and there is the possibility that college students could have been familiar with these drinks in the mid-2000’s since they were available on the market at that time. Haynes (2009) assumed that items in their choice set were unfamiliar to college students, such as a hot air balloon ride or a massage treatment. Once again though, familiarity was not measured even though college students could have been familiar with experiences such as choosing a massage treatment, and thus this lack of measurement could have affected their choice overload results. Thus in general, previous studies
have either assumed familiarity without measuring it, or have measured constructs that could have been a partial measurement of familiarity. This inconsistency with regards to measuring familiarity across studies could have affected results, and these previous studies in choice overload may have produced differing results if familiarity was measured consistently across these studies.

One potential reason as to why familiarity has such a strong effect on satisfaction with a participant’s final choice is mentioned in past literature; Scheibehenne, Greifeneder, and Todd (2010) write in their meta-analysis of choice overload studies, “experiments on choice overload have typically used options that decision makers are not very familiar with to prevent strong prior preferences for a specific option and consequently a highly selective search process that would allow participants to ignore most of the assortment.” (p. 410).

Familiarity (semesters participants have used the course catalog system to choose courses) was also significantly related to familiarity with the course catalog format. There was also a significant effect of category type on levels of familiarity with the course catalog format when controlling for familiarity (semesters participants have used the course catalog system to choose courses).

4.1.6. Contributions to Testing Choice Overload

The fact that the hypotheses were not supported could be considered significant due to the nature of the study. The first factor of significance was that this study was conducted in a naturalistic environment. Testing college students utilizing a course catalog is in fact a scenario that college students encounter every semester, as well as it is a scenario upon which there are an incredibly large number of choices naturally available. Additionally, this study allowed for
students to participate at their own pace from whenever they would like and using whatever device they felt comfortable with. This was again to create as natural of an environment as possible. Although Iyengar and Lepper’s (2000) original jam study was conducted in a real physical store environment, many of the choice overload studies since then have been conducted in lab environments or some sort of controlled environment.

The second factor of significance was that the assortment set size of 389 choices was much larger than almost all other choice overload studies. Scheibehenne, Greifeneder, and Todd’s (2010) meta-analysis analyzed 63 choice overload studies, and of those studies, only one had a greater number of choices (504 choices, of which was part of an unpublished study). 53 of the 63 studies had choice sets of 90 choices or lower. One has to ask the question as to how many choices is too much choice? Iyengar and Lepper (2000) stated too much choice as having a choice set that is, “reasonably large, but not ecologically unusual, number of options.” (p. 996) 389 choices of elective courses seems reasonably large, but clearly not unusually large for a major public university.

The third factor of significance is the recent meta-analysis of choice overload studies positing that choice overload effects may not actually exist (Scheibehenne, Greifeneder, & Todd, 2010). In their meta-analysis, they found many studies that could not reproduce choice overload effects for experiments conducted to replicate prior studies on choice overload. Although choice overload effects were not found in this study, this study was not a direct reproduction of any prior studies, but rather a study to build on previous studies on mere categorization (Mogilner, Rudnick, & Iyengar, 2008) and type of categorization (Poynor & Diehl, 2007) and their effects on choice overload.
4.2. Future Research

Future research could be conducted in the realm of what aspects of an online course catalog could be manipulated to make the catalog seem more familiar to users. There are certain elements of a course catalog that we see in online environments everyday, such as organizational structures of webpages, graphical interface design of webpages, and so forth. Since college students spend a substantial portion of their time utilizing social media websites, creating course catalogs that look and feel similar to social media websites could heighten familiarity for students unfamiliar with course catalogs. This brings to light that how the sites look visually may play a large part in differences with regards to choice overload.

Another area of future research is looking at categorization types (taxonomic, thematic, and no categorization) with regards to time spent on sites. When average time spent on each version of a course catalog was analyzed within Google Analytics, I found that participants that were assigned to the thematic catalog spent 1.5 times longer on the thematic catalog as a whole versus the participants assigned to the taxonomic catalog as a whole, and 1.4 times longer on the thematic catalog as a whole versus participants in the catalog with no categorization as a whole. Since Google Analytics does not allow us to analyze each visit individually, statistical comparisons could not be made. With this said, if these differences were significant, this could potentially have large implications to both course catalogs as well as consumer websites since this study found that there were no choice overload differences between taxonomic and thematic catalogs. If utilizing thematic categorization keeps a student browsing a course catalog longer without overloading them, this could prove beneficial to helping students spend more time investigating courses as a whole. With regards to consumer websites, if utilizing thematic categorization keeps consumers browsing longer without additional choice overload, this could
prove beneficial both to business as well as be beneficial for online advertisers. Future research could be conducted with tracking code to separate time spent on sites by user so that statistical comparisons could be made.

Manipulating category number is also another potential area of future research. Since this was again a situation in which overall choice of classes could not be reduced, another manipulation that could be tested is putting all the classes into fewer main categories and testing to see if that affects choice overload measures at all compared to the natural larger amount of categories.

Lastly, in the future this study could be broken up into a study building solely on mere categorization (Mogilner, Rudnick, & Iyengar, 2008) or thematic versus taxonomic categorization (Poynor & Diehl, 2007) and their effects on choice overload. Due to combining these two studies and testing manipulations to build on those studies, this current study was potentially confounded with too many contributing factors that may have affected the results.

4.3. Limitations

Due to my desire to conduct the study in a naturalistic environment, participants were not monitored in a controlled lab environment. There could have been a higher rate of participants not taking the study seriously compared to a lab environment. To attempt to control for this, IP addresses were tracked to check for duplicate submissions, and participants’ browsing patterns were monitored as a whole utilizing Google Analytics.

Additionally, during the pre-tests, pre-test participants were snowball sampled and assigned to five different versions of a pre-test site. Due to a personal error, participants were not randomly assigned to one of the five versions of a pre-test site, but rather participants were put
into five groups (aggregated by geographic location such as students working for a campus help desk group or students from a local religious organization) and each group was assigned a pre-test site. In future studies, I would most definitely randomly assign these assignments.

Single-item measures were used for this study compared to multiple-item measures due to looking at the measures of previous choice overload studies, but this could have created difficulty in appropriately analyzing the study. Participants due to potentially ambiguous wording of the questions could have interpreted the single-item measures differently. For example, the measure of familiarity was potentially a bit ambiguous in its wording as I asked how familiar the course catalog format seemed to the participants. This measure of familiarity of the format of the course catalog could have both been interpreted differently by participants as well as could have measured a different familiarity than what was being measured in past studies. Due to this, semesters that participants have used a course catalog were used for the measure of familiarity for this study.

In regards to Mogilner, Rudnick, and Iyengar’s (2008) mere-categorization effect, although I was utilizing a different stimuli organizational structure than their study, their coffee study stimuli could have been a limitation to both their results as well as my results. The four versions of their menu were split up into one that was not categorized, one that was informatively categorized, one that was somewhat informatively categorized, and one that was completely uninformative in its categorization. Their results showed that categorizing increased chooser satisfaction for preference-constructing participants, but there was no difference between the three types of categorization. The first menu looked strikingly different visually than the other three (see Appendix C), thus the visual differences between the first and the other three could have contributed to their results rather than the existence of categories versus no
categories. In this study, the course catalog without categorization was also visually different than the taxonomic and thematic catalogs, as it was not possible to structure it in a way where the no categorization catalog would look visually similar to the categorized catalogs. This was both due to the number of hyperlinks that needed to be shown on the first page in the no categorization catalog compared to the categorized catalogs (389 class hyperlinks versus 96 category hyperlinks) as well as due to taxonomic course indicators needing to be attached to course listings to prevent confusion with classes with the same name (e.g. Undergraduate Open Seminar) in the no categorization catalog (see Appendix A). Future research could be conducted with the conditions of categorization and no categorization being visually similar.

An additional measure of asking participants whether or not they had a preference for an elective course coming into the study would have been beneficial, as it has been found through past studies that having strong prior preferences for certain choices could affect choice overload (Scheibehenne, Greifeneder, & Todd, 2010).

Lastly, as explained in the results section, all of the dependent variable measurements were underpowered and there was the potential for type II error. This was due to the lack of effect size reporting in past choice overload literature, which produced an inability to accurately estimate proper sample size requirements. Additional participants will be added in the future to this study to achieve appropriate power.

4.4. Final Remarks

Despite the lack of expected results from this study, future research including increasing power may prove fruitful, and investigating choice overload is definitely a worthwhile endeavor. With the growth of online course offerings such as MOOCs (massive open online course) and
the explosion of products offered to consumers within online stores, choice overload will almost indeed continue to be an ever-growing issue. Future work in this area will most likely need to be conducted utilizing methods such as big data analysis of website user data sets. Partnerships with online consumer companies may provide the data and insight needed to more thoroughly test the construct of choice overload.
References


Chernev, A. (2003). When more is less and less is more: The role of ideal point availability and assortment in consumer choice. *Journal of Consumer Research, 30*, 170-183.


### Table 1 – Categorization Effects of Choice Overload

<table>
<thead>
<tr>
<th>Measures</th>
<th>No Category (N=46)</th>
<th>Taxonomic (N=48)</th>
<th>Thematic (N=51)</th>
<th>F</th>
<th>Partial $\eta^2$</th>
<th>1-$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>7.80 (1.54)</td>
<td>7.60 (1.62)</td>
<td>7.20 (1.54)</td>
<td>1.50</td>
<td>0.02</td>
<td>0.32</td>
</tr>
<tr>
<td>Ease of Choice</td>
<td>7.39 (2.16)</td>
<td>7.13 (1.79)</td>
<td>6.73 (2.07)</td>
<td>1.16</td>
<td>0.02</td>
<td>0.25</td>
</tr>
<tr>
<td>Likelihood to Register</td>
<td>7.02 (2.07)</td>
<td>7.10 (2.06)</td>
<td>6.82 (2.10)</td>
<td>0.30</td>
<td>0.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Frustration</td>
<td>3.39 (2.35)</td>
<td>4.06 (2.20)</td>
<td>3.67 (2.05)</td>
<td>0.94</td>
<td>0.01</td>
<td>0.21</td>
</tr>
<tr>
<td>Perceived Similarity</td>
<td>4.91 (2.18)</td>
<td>5.15 (2.11)</td>
<td>5.14 (1.55)</td>
<td>0.30</td>
<td>0.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Familiarity with Course Catalog Format</td>
<td>7.00$_a$ (2.46)</td>
<td>7.81$_{ab}$ (1.93)</td>
<td>6.63$_b$ (2.23)</td>
<td>4.23*</td>
<td>0.06</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Note. ANCOVA. Familiarity (Semesters participants have used a course catalog system to choose courses) was entered as covariate and controlled for. Standard deviations appear in parentheses below means.

* p < .05.

Means with differing subscripts within rows are significantly different at the p < .05 based on pairwise comparisons.
<table>
<thead>
<tr>
<th>Measures</th>
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<th>$p$</th>
<th>$r$</th>
<th>$1-\beta$</th>
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<tbody>
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<td>Satisfaction</td>
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<td>0.03*</td>
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<td>Ease of Choice</td>
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<tr>
<td>Frustration</td>
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<td>0.31</td>
<td>0.09</td>
<td>0.17</td>
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<tr>
<td>Familiarity with Course</td>
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<td>0.00*</td>
<td>0.35</td>
<td>0.99</td>
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<tr>
<td>Catalog Format**</td>
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<td></td>
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</tbody>
</table>

Note. ANCOVA. Familiarity as covariate and its relationship with choice overload measures.  
* = $p < .05$.  
** Familiarity with course catalog format is a different measure than the familiarity used as a covariate for reasons as explained in the limitations section. Familiarity with course catalog format is not a measure of choice overload.
Table 3 – Planned Contrasts for Mere Categorization Testing of Choice Overload

<table>
<thead>
<tr>
<th>Measures</th>
<th>t</th>
<th>p</th>
<th>r</th>
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</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>-1.20</td>
<td>0.23</td>
<td>0.10</td>
</tr>
<tr>
<td>Ease of Choice</td>
<td>-1.18</td>
<td>0.24</td>
<td>0.10</td>
</tr>
<tr>
<td>Likelihood to Register</td>
<td>-0.30</td>
<td>0.76</td>
<td>0.03</td>
</tr>
<tr>
<td>Frustration</td>
<td>0.98</td>
<td>0.33</td>
<td>0.08</td>
</tr>
</tbody>
</table>

* = p < .05.
Table 4 – Planned Contrasts for Type of Categorization (Taxonomic versus Thematic) Testing of Choice Overload

<table>
<thead>
<tr>
<th>Measures</th>
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<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>-1.23</td>
<td>0.22</td>
<td>0.12</td>
</tr>
<tr>
<td>Ease of Choice</td>
<td>-0.99</td>
<td>0.32</td>
<td>0.10</td>
</tr>
<tr>
<td>Likelihood to Register</td>
<td>-0.74</td>
<td>0.46</td>
<td>0.08</td>
</tr>
<tr>
<td>Frustration</td>
<td>-0.97</td>
<td>0.34</td>
<td>0.10</td>
</tr>
<tr>
<td>Perceived Similarity</td>
<td>0.04</td>
<td>0.97</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* = p < .05.
Appendix A
Three Course Catalog Sites

Taxonomic Course Catalog Main Page (Partial Screenshot)
Actual page can be found at http://www.electiveclasschoice.com/tx100

Registration for Spring 2014 UIUC classes begins in early November. Please look through this course catalog below and find an elective course that you would be interested in taking next semester. Once you have made your selection (or if you decide not to make a selection after spending some time searching), please click on the following survey link to finish this experiment.

SURVEY LINK

SPRING 2014 ELECTIVE COURSE LISTING

Asian American Studies
Agricultural and Consumer Economics
Agricultural, Consumer and Environmental Sciences
African American Studies
Agricultural Communications
Agricultural Education
American Indian Studies
Animal Sciences
Anthropology
Arabic
Architecture
Art
Art--Education
Art--History
Art--Studio
Atmospheric Sciences
Aviation
Business Administration
Chemistry
Community Health
Classical Civilization
Communication
Crop Sciences
Registration for Spring 2014 UIUC classes begins in early November. Please look through this course catalog below and find an elective course that you would be interested in taking next semester. Once you have made your selection (or if you decide not to make a selection after spending some time searching), please click on the following survey link to finish this experiment.

SURVEY LINK

SPRING 2014 ELECTIVE COURSE LISTING

Becoming A Librarian
Becoming A Linguist
Becoming A Mechanic
Becoming A Politician
Becoming A Social Worker
Becoming An Actor
Becoming An Anthropologist
Becoming An Archaeologist
Becoming An Architect
Becoming An Author
Becoming An Educator
Becoming An Engineer
Becoming An Entrepreneur
Communicating Effectively
Connecting Cross-Culturally
Enjoying Drama
Enjoying Film
Enjoying Literature
Enjoying Music
Enjoying Nature
Enjoying Theater
Exploring Diversity
Exploring Technology
Registration for Spring 2014 UIUC classes begins in early November. Please look through this course catalog below and find an elective course that you would be interested in taking next semester. Once you have made your selection (or if you decide not to make a selection after spending some time searching), please click on the following survey link to finish this experiment.

**SURVEY LINK**

### SPRING 2014 ELECTIVE COURSE LISTING

<table>
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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>AAS-100</td>
<td>Intro Asian American Studies</td>
</tr>
<tr>
<td>AAS-246</td>
<td>Asian American Youth in Film</td>
</tr>
<tr>
<td>AAS-299</td>
<td>Begin Topics Asian Am Studies</td>
</tr>
<tr>
<td>ACE-100</td>
<td>Agr Cons and Resource Econ</td>
</tr>
<tr>
<td>ACE-161</td>
<td>Microcomputer Applications</td>
</tr>
<tr>
<td>ACE-199</td>
<td>Undergraduate Open Seminar</td>
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<tr>
<td>ACE-254</td>
<td>Economic Systems in Africa</td>
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<td>ACES-199</td>
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<td>AFRO-100</td>
<td>Intro to African American St</td>
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<td>AFRO-101</td>
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<td>AFRO-103</td>
<td>Black Women in the Diaspora</td>
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<td>AGCM-330</td>
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<td>Intro to Leadership Studies</td>
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<td>AIS-101</td>
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<td>Contemporary Animal Issues</td>
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<tr>
<td>ANSC-207</td>
<td>Companion Animal Biology &amp;Care</td>
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<tr>
<td>ANSC-211</td>
<td>Breeding Animal Evaluation</td>
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</tbody>
</table>
## Appendix B
### Choice Overload Questionnaire

#### Evaluation of the Choice Process

How many semesters have you used a course catalog to choose classes?

<table>
<thead>
<tr>
<th></th>
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</table>

Please choose your undergraduate year in school

- Freshman
- Sophomore
- Junior
- Senior
- Senior+
- Not an undergraduate student

How familiar did the course catalog format seem to you?

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</tbody>
</table>

Were you able to select a course from the catalog that you are interested in registering for?

- Yes
- No

How satisfied are you with your choice?

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<thead>
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<th></th>
<th>1</th>
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<th>3</th>
<th>4</th>
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How easy was it to make a choice?

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What is your likelihood that you will actually register for the class that you selected from this course catalog?

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How frustrated did you feel when attempting to make a choice?

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How similar did you feel the classes were to each other?

Not similar at all - 1

2

3

4

5

6

7

8

9

Very similar - 10

How did you keep record of your class selection? (i.e. wrote it down on a notepad, put it in a note in your phone, etc.)

How many classes did you select?

- 1

- 2

- 3

- 4

- 5

What do you think the purpose of this study was?

Please write any comments, questions, or suggestions that you may have for us below. (optional)
Appendix C
Mogilner, Rudnick, and Iyenger’s (2008) Coffee Study Stimuli

**FIGURE A1**
NO CATEGORIES

**FIGURE A2**
TEN ATTRIBUTE-BASED CATEGORIES

**FIGURE A3**
TEN COFFEE-SHOP-BASED CATEGORIES

**FIGURE A4**
TEN ALPHABET-BASED CATEGORIES

---

**Coffee Menu**

**Complex**
Arabian Mocha Java
Kenya Coffee
Holiday Blend
Gold Coast Blend
Top Blend
Guatemala
Honduras
Ecuador
Costa Rica
Cuban Coffee
Honduras Blend
Bolivian Blend
Havana Blend
Light Roast Blend
Aged Rum Cask
Gaelic Blend
Romana
Galiano
Gaelic Blend
Columbian Select
Columbian Paco Marquez

**Tangy**
Espresso Forte
Far Trade Blend
Ethiopian Fancy
Yemen Blend
Java Blend
Kona Coffee
Holiday Blend
Gold Coast Blend
Top Blend
Guatemala
Honduras
Ecuador
Costa Rica
Cuban Coffee
Honduras Blend
Bolivian Blend
Havana Blend
Light Roast Blend
Aged Rum Cask
Gaelic Blend
Romana
Galiano
Gaelic Blend
Columbian Select
Columbian Paco Marquez

---

**The Coffee Shop**

**Java Joe’s**
Espresso Forte
Fair Trade Blend
Ethiopian Fancy
Yemen Blend
Java Blend
Kona Coffee
Holiday Blend
Gold Coast Blend
Top Blend
Guatemala
Honduras
Ecuador
Costa Rica
Cuban Coffee
Honduras Blend
Bolivian Blend
Havana Blend
Light Roast Blend
Aged Rum Cask
Gaelic Blend
Romana
Galiano
Gaelic Blend
Columbian Select
Columbian Paco Marquez

**The Paninik**

**The Gathering**
Espresso Forte
Fair Trade Blend
Ethiopian Fancy
Yemen Blend
Java Blend
Kona Coffee
Holiday Blend
Gold Coast Blend
Top Blend
Guatemala
Honduras
Ecuador
Costa Rica
Cuban Coffee
Honduras Blend
Bolivian Blend
Havana Blend
Light Roast Blend
Aged Rum Cask
Gaelic Blend
Romana
Galiano
Gaelic Blend
Columbian Select
Columbian Paco Marquez

---

**The Java House**

**The Living Room**
House Blend
Bolivian Blend
Bolivian Blend
House Blend
Top Blend
Guatemala
Honduras
Ecuador
Costa Rica
Cuban Coffee
Honduras Blend
Bolivian Blend
Havana Blend
Light Roast Blend
Aged Rum Cask
Gaelic Blend
Romana
Galiano
Gaelic Blend
Columbian Select
Columbian Paco Marquez

**Lola’s**

**Category A**
Arabian Mocha Java
Kenya Coffee
Holiday Blend
Gold Coast Blend
Top Blend
Guatemala
Honduras
Ecuador
Costa Rica
Cuban Coffee
Honduras Blend
Bolivian Blend
Havana Blend
Light Roast Blend
Aged Rum Cask
Gaelic Blend
Romana
Galiano
Gaelic Blend
Columbian Select
Columbian Paco Marquez

**Category B**
Espresso Forte
Far Trade Blend
Ethiopian Fancy
Yemen Blend
Java Blend
Kona Coffee
Holiday Blend
Gold Coast Blend
Top Blend
Guatemala
Honduras
Ecuador
Costa Rica
Cuban Coffee
Honduras Blend
Bolivian Blend
Havana Blend
Light Roast Blend
Aged Rum Cask
Gaelic Blend
Romana
Galiano
Gaelic Blend
Columbian Select
Columbian Paco Marquez

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**Category I**
Gaelic Blend
San Francisco Blend
Cuban Coffee
Honduras Blend
Bolivian Blend
Havana Blend
Light Roast Blend
Aged Rum Cask
Gaelic Blend
Romana
Galiano
Gaelic Blend
Columbian Select
Columbian Paco Marquez

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**Category J**
Single Estate Mocha
San Francisco Blend
Cuban Coffee
Honduras Blend
Bolivian Blend
Havana Blend
Light Roast Blend
Aged Rum Cask
Gaelic Blend
Romana
Galiano
Gaelic Blend
Columbian Select
Columbian Paco Marquez