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How Many Is Enough?
The Effects of Number of Options and Selections on
Perceived Freedom of Choice and Satisfaction

Carla Krachun

A thesis submitted to the Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of
Master of Arts
Department of Psychology

Carleton University

Ottawa, Ontario

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Freedom of Choice and Satisfaction"

submitted by

Carla Krachun

in Partial fulfillment of the requirements for
the degree of Master of Arts

Chair

Thesis Supervisor

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Abstract

The effects of number of options (items to choose among) and selections (items to choose) on perceived freedom of choice (PFC) and satisfaction were investigated. It was predicted that increasing either would boost PFC and satisfaction in a monotone increasing, negatively accelerated fashion. Based on a computer simulation, it was also predicted that selections would have a greater effect than options. These predictions were supported, with one exception. Satisfaction with the decision outcome, as opposed to the decision situation, was not affected by selections. Further findings were that PFC was correlated with satisfaction, and that one selection produced results different from any number of multiple selections. Advice for decision makers is to recognize that there are diminishing returns on increasing options or selections, that increasing one's selections might be preferable to increasing one's options, and that satisfaction with a decision situation does not guarantee satisfaction with its outcome.

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How many is enough? The effects of number of options and selections on perceived freedom of choice and satisfaction

For centuries freedom has been a much sought-after and often elusive goal. Social movements have been born, wars have been waged, people have fought and died in the name of freedom. Among the many kinds of freedom that people have so passionately struggled to gain is freedom of choice in making decisions.

Freedom to choose—how to spend one's time, what courses of action to take, which goals to pursue—seems to give people a sense of control over their lives. The consequences of not having such control are serious. Dissatisfaction, apathy, helplessness, depression, illness, and even death are just some of the effects that have been observed (Janis & Mann, 1977). Feeling that one has the freedom to decide for oneself, to choose according to one's own desires and preferences, is clearly important. Less clear are the factors that contribute to the feeling that one enjoys freedom of choice in making decisions. Two of them may be (1) the number of options available to a decision maker and (2) the number of selections a decision maker can make.

In common usage, the words options and selections are often synonymous. It is therefore necessary to specify precisely what these variables mean for the purposes of this study. The number of options will refer here to the number of items a decision maker can choose among. A movie-goer, for instance, may choose one film from among the 10 options that are currently playing. The number of selections will refer to the number of items a decision maker can select from all those available. A movie-goer planning to see

a double-bill can select 2 of the 10 films available, for example, rather than just one. The main purpose of this study will be to investigate the effects of both options and selections on a decision maker's perceived freedom of choice.

Freedom in past research

Freedom has been the subject of discussion more often among philosophers than among psychologists. Philosophers have for centuries sought to define or explain the concept of freedom in some objective way. Much effort has been expended in identifying the factors that make a person free—factors that may be either external or internal to the individual. Perhaps the most commonly agreed-upon criterion for assessing the presence of freedom is the absence of constraints imposed by other people upon a decision maker, such as laws, prohibitions, physical barriers, threats and manipulation. It has also been suggested that in order to be truly free, a person must not only be “free from” external constraints or pressures but must also have needed resources to be “free to” achieve desirable goals. Depending on the goal, the resources required may include money, physical ability, talent, knowledge, education, or connections in high places, among others. The distinction between “freedom from” and “freedom to” is often expressed as the difference between negative and positive freedom, respectively. In either case, the criteria for judging whether or not a person is free are assumed by philosophers to be objective. (For in-depth discussions of negative and positive freedom and other topics related to freedom, see Bauman, 1988; Cranston, 1953; Dixon, 1986; & MacCallum, 1967.)

When freedom has appeared in the psychological literature the focus has been more on its subjective aspects. Unlike in philosophy, the early focus was not so much on the objective determinants of freedom, but on the effects of freedom on peoples' feelings and behaviors. Freedom was looked upon not as an objectively definable state, but as a subjective experience. The extent to which people believe themselves free to choose was considered important. This subjective impression has been called different names throughout the literature, including "perceived freedom", "perceived choice", "perceived freedom of choice", or simply "choice". In the discussion of past research which follows, I have in some cases preserved the terms used in the original studies. Whenever possible, however, I have maximized consistency by using the term "perceived freedom of choice" or its abbreviation, PFC.

Research on cognitive dissonance is one area of psychology in which the concept of freedom has appeared. Cognitive dissonance theorists (e.g., Brehm & Cohen, 1962; Festinger, 1957 & 1964; Linder, Cooper, & Jones, 1967) suggest that people experience more post-decisional dissonance when they believe they had freedom of choice in making a decision than when they believe they had little freedom of choice. Cohen, Terry and Jones (1959) were among the first to use direct manipulation of perceived freedom of choice (PFC) as an intervening variable, demonstrating that high PFC was associated with greater cognitive dissonance. They created a "high-choice" condition by informing participants that it was entirely their own decision whether or not to hear information discrepant with their stated attitude on an issue. In the "low-choice" condition, the experimenter simply proceeded to read the discrepant information to participants without

giving them any say in the matter. The success of the experimental manipulation was verified by asking participants in both conditions to indicate on a 6-point scale how much choice they felt they had had in being exposed to the discrepant information. A highly significant difference between the participants' ratings was observed, with participants in the low-choice condition reporting lower PFC than those in the high-choice condition. As predicted, the researchers also found that participants in the high-choice condition displayed more attitude change, a typical response in people experiencing a great amount of dissonance.

Following the Cohen et al. (1959) study were a number of experiments throughout the 1960s employing the somewhat inaptly named "forced compliance technique" to study cognitive dissonance (e.g., Brock, 1962; Davis & Jones, 1960; Festinger, 1964). In the forced compliance paradigm participants are told they are completely free to choose between two courses of action, but they are strongly encouraged by the experimenter, "for the good of science", to choose the act discrepant with their attitudes. The goal is to create high PFC while still inducing the participant to perform the discrepant act, a situation that should result in high cognitive dissonance. Davis and Jones (1960) used this technique to examine the role of degree of perceived choice in interpersonal perceptions. In the "choice" condition, participants were induced by forced compliance into reading a highly negative evaluation of a person while that person listened, even though the participants' feelings about the person were not actually negative. In the "no choice" condition, participants were simply told they had been randomly assigned to the group that would read the negative evaluation. The

experimenters found that participants who had the illusion of choice in reading the negative evaluation exhibited more dissonance than those in the no-choice condition. The success of the degree of choice manipulation was again verified in a post-experimental questionnaire, although those authors were not clear on exactly how it was measured. In a similar forced compliance experiment Festinger (1964) created cognitive dissonance by inducing participants to read a negative evaluation of someone they had heard interviewed, even though the participants felt at least moderately positive about that person. Festinger used a scale from 0 to 100 to measure PFC, with 0 indicating no choice at all and 100 indicating complete freedom of choice. He did not, however, include a low-choice condition in his study, and his attempt to create perceived freedom of choice in all his participants was only moderately successful, the average PFC rating being only 60.4.

Attribution theorists have recognized PFC as an important variable because of its effects on attributions and their related behaviors (Harvey, 1976). They suggest that people are more likely to attribute their own or others' actions to dispositional qualities if they believe there was freedom of choice in performing the actions (e.g., Bem, 1972; Kelley, 1967; Nisbett & Valins, 1971). Empirical support for this proposition has been obtained in a number of studies. A representative example is an experiment carried out by Steiner and Field (1960), who had an accomplice express a controversial opinion in discussion groups with real experimental participants. In half of the groups, the participants were led to believe the accomplice had been told by the researchers to adopt the opinion. In the other half, participants were led to believe the accomplice had chosen to express the opinion himself. Participants were more likely to attribute an attitude

consistent with the opinion to the accomplice when they believed he had chosen his actions freely. Others who have obtained results consistent with a relationship between PFC and attributions include Ajzen (1971), Jones and Harris (1967), Jones, Worchel, Goethals, and Grumet (1971), and Miller (1974).

Studies on psychological reactance have looked at the behavioral consequences of having more or less perceived freedom of choice (e.g., Brehm, 1966; Wicklund, 1974). Researchers have studied the negative reactions people experience when their freedom is threatened or restricted, and the methods they employ in trying to reinstate it, such as attempting to engage in a threatened or eliminated behavioral freedom. Apparently, the motivation to regain lost options is so compelling that decision makers will often forego their originally intended choice in order to pursue the eliminated option. Restrictions on freedom have typically been imposed in reactance studies by eliminating options previously available to a decision maker. Interestingly, reactance is aroused even when the decision maker believes the elimination was due to impersonal, chance factors. There is much empirical support for the reactance effect. Brehm (1966) cites studies that have found an increase in the rated attractiveness of an eliminated option (cf. Brehm, Stires, Sensenig & Shaban, 1966; Hammock & Brehm, 1966), and also studies demonstrating that decision makers who feel they are being coerced into choosing a particular item in a free-choice task will often rate that item lower in attractiveness and be less likely to select it (cf. Brehm & Sensenig, 1967; Burton, 1966; Weiner, 1966).

In all of the examples cited above perceived freedom of choice was studied as an intervening variable, or as a third factor whose presence helps to determine how people

will feel, what they will think, and how they will act. In 1970, Ivan Steiner argued that because PFC had such dramatic effects on behavior in a wide variety of situations, it was important to determine its causes. He urged researchers to take a closer look at this variable, and laid the groundwork for further study by providing a detailed analysis of the concept. Steiner distinguishes between two types of what he calls “perceived freedom”: outcome and decision freedom. Outcome freedom occurs, he suggests, when people feel they have a high probability of obtaining desired outcomes. Anything that increases the subjective probability of obtaining a desired outcome will therefore increase perceived outcome freedom. Decision freedom, on the other hand, is the perception that one chooses for oneself whether or not to seek an outcome, or which outcome to seek among a number of available outcomes, without being compelled or coerced by outside forces. We can think of perceived freedom of choice in a decision-making situation as resulting from some combination of outcome and decision freedom. If, faced with choosing among alternatives, you feel that you exercise your own volition, and if you feel that the probability of obtaining an outcome you desire is reasonably high, you will likely perceive yourself to have much freedom of choice. A reduction in either of these elements will reduce PFC, and a boosting of either outcome freedom or decision freedom will result in higher overall PFC.

Though Steiner points out that each type of perceived freedom can occur without the other, it is obvious that having decision freedom without also having outcome freedom, and vice versa, is not very practical. There is little freedom in being able to choose freely among options if none of the options provides a reasonable chance of

fulfilling your desires. Likewise, the existence of options that could fulfill your desires is of little use if you do not have the freedom to choose among them. Perhaps for these reasons, researchers studying the determinants of perceived freedom of choice have not typically distinguished between the two concepts, but have instead focused on finding factors that contribute to a more general perception of freedom.

Harvey (1976) describes a number of studies examining the determinants of PFC (called “perceived choice” throughout those studies). The determinants investigated include similarity in attractiveness of options, uncertainty about outcomes of options, and valence of options, among others. One of the studies described is by Harvey and Johnston (1973), who conducted two experiments to investigate some possible determinants of PFC. The variables they chose to examine were based on an analysis by Judson Mills, which is summed up in Harvey and Johnston’s research report. Mills argues that perceived freedom of choice in taking an action is the perception that an alternative course of action exists. To be considered a true alternative, the other course of action must have an outcome that differs in attractiveness from the first one. In addition, there should be some likelihood that the alternative course of action will lead to a better outcome. Based on Mills’ ideas, Harvey and Johnston (1973) looked at how PFC is influenced by the relative difference in attractiveness of outcomes and also by the certainty that particular outcomes will occur. Their first experiment employed an observer paradigm, having participants judge the freedom of choice of others making a decision between two alternatives. In the second experiment participants rated their own PFC after choosing one of two alternatives. PFC was rated by participants on a scale

of 0–20 where 0 was very little choice and 20 was very much choice. In both experiments the researchers found support for their predictions that PFC would be greater when there was a small rather than large relative difference in attractiveness between the outcomes, and also that greater uncertainty in outcomes would be associated with more PFC. An interaction between the variables was also supported, with relative attractiveness of the outcomes having more of an effect on PFC under high uncertainty than under low uncertainty (although this result was only marginally significant in the second experiment). In addition, Harvey and Johnston found some support for the idea that PFC is lower when outcomes are virtually identical in attractiveness than when they are only similar in attractiveness. Those researchers also predicted that the more time it took to make a decision, the greater the PFC would be. Their reasoning was that taking more time to decide would be interpreted by the decision maker as deliberating more over the possible alternatives, and that this would lead to a perception of greater choice. While the first experiment supported this hypothesis, the second did not. The researchers suggested this may have been a function of the two different manipulations: In the first experiment participants were told how much time it took someone else to make a decision, and in the second they were told how much time they themselves would be given to make a decision. In the latter case the manipulation may have been unsuccessful in creating differences in perceived deliberation between the conditions.

Harvey, Barnes, Sperry and Harris (1974) also examined the effect of similarity in attractiveness of options on PFC, this time with the added variable of whether or not decision makers had an internal or external locus of control. The researchers suggested

that internals might be more sensitive than externals to characteristics of options that permit a sense of freedom of choice. They predicted that internals would therefore perceive greater choice when the options were similar in attractiveness than when they were either dissimilar or virtually identical in attractiveness. Externals, being less sensitive, would be less affected by these manipulations. The results of a task in which participants chose between two alternatives and then rated their PFC on a 21-point scale supported this prediction. In a second study, those researchers examined the effects of both locus of control and valence of outcomes on PFC. Participants, half of them internals and half externals, were told they could choose one of two types of visual stimulation to be exposed to. In half the cases, the outcome was positive and in half it was negative (i.e., the visual stimulation was either pleasant or unpleasant, purportedly as rated by participants in a pilot study). After having the opportunity to examine information on each type of stimulation, and before making their decision, participants were asked to rate their PFC in deciding which type of stimulation to select. The results supported the prediction that internals would be more affected by the valence of an outcome than externals. While internals reported significantly more PFC when the outcomes were positive than when they were negative, the difference for externals was not significant. The researchers also found that, overall, PFC was greater when the outcomes were positive than when they were negative, indicating that valence of outcomes may be one determinant of perceived freedom of choice.

Harvey and Harris (1975) also found support for the idea that PFC is greater when the options are positive than when they are negative. Interestingly, these researchers also

found evidence that valence interacted with the similarity of attractiveness of the options; similarity affected perceived freedom of choice only when the options were positive and not when they were negative. Once again, these researchers used as the decision-making task a choice between two visual stimuli, and participants rated their PFC on a 21-point scale.

In an extensive search of the psychology literature, I found only one study that examined the effect of number of options on perceived freedom of choice. Harvey and Jellison (1974) suggest that “in general, the greater the number of possible options from which a person can make a selection, the greater should be his perception of choice” (p. 539). This is the case, they argue, because an increase in possibilities results in greater uncertainty about which option will yield the best outcome, and uncertainty about outcomes has been shown to increase PFC (Jellison & Harvey, 1973; Harvey & Johnston, 1973). In addition to examining number of options, Harvey and Jellison (1974) looked at the effect of time taken to make a decision on the decision maker’s PFC. Again drawing on the idea of uncertainty, those researchers suggested that a person who takes a long time to make a decision may perceive that he or she experienced more uncertainty when considering the options. That greater uncertainty may then be interpreted as indicating greater freedom of choice. The researchers tested these ideas in an experiment in which they manipulated the number of options available to decision makers (3, 6 or 12, representing small, intermediate, and large numbers of options). They also manipulated the perceived time taken to make a decision by telling participants they had taken a shorter or longer time than average to make their decision. The participants’ task was to

select the best football team to participate in a bowl game and to rate on a scale of 0–20 their perceived choice in making the selection. Some interesting interactions between time and number of options were found. Namely, when a person believed he or she had taken a relatively short time to make a decision, PFC increased with the number of options. When a person believed he or she had taken a relatively long time to decide, however, an intermediate number of options resulted in the greatest PFC. Finally, PFC increased as the time taken to make a decision increased, except when the choice situation involved a very large number of options. In the latter case, more time taken resulted in lower perceived freedom of choice.

Variable 1: Number of options

It seems intuitively plausible that, in general, an increase in options will result in greater perceived freedom of choice. In the academic literature on the subject, a positive relationship between the two is often simply taken for granted. Brehm (1966) suggests, for example, that number of options has a direct effect on freedom when he states, “the number of behavioral freedoms available to a person can be established by giving him greater or lesser numbers of choice alternatives” (p. 29). And Steiner (1970) seems to assume a positive relationship when he equates greater numbers of alternatives with higher decision freedom. That the sense of freedom will increase as the number of choice options increases seems to Harvey (1976) to be a “rather intuitive hypothesis” (p. 82).

The past studies on PFC described earlier suggest some reasons why this might be the case. Harvey & Johnston (1973) argue that greater time taken to make a decision may be interpreted by the decision maker as having greater freedom of choice. Therefore, if

increasing the number of options increases the time it takes to decide among them, we might guess that it would also increase PFC. The complex interactions between time and number of options found by Harvey and Jellison (1974), however, indicate that the relationship between these variables may not be that simple.

Harvey and Jellison (1974) suggest that increasing the number of options decreases the certainty that any particular option will result in the best outcome, and that this uncertainty increases PFC. They also argue that positive options are associated with greater PFC than negative ones. Therefore, we might infer that if increasing the number of options also increases, by consequence, the number of options among them which the decision maker finds attractive (or positive), then it might increase perceived freedom of choice.

Steiner (1970) suggests that a greater number of options may result in greater PFC because it increases the cognitive effort expended in making the decision, which is attributed by the decision maker to having more choice. There is some experimental evidence that increasing the number of options does in fact make a decision more difficult. Tversky and Shafir (1992) and Dhar (1997) (both cited in Luce 1998) each found an increased preference for prolonging a decision—a well-known avoidance technique when facing a difficult decision—when the set of available options was expanded. They attributed this to “between-attribute decision conflict”, or a difficulty in making acceptable trade-offs between the features of the options. As the number of options increases, it usually becomes more difficult to trade features of some off against features of others. The process of weighing one feature against another becomes more

complex, and the decision maker has to sacrifice more features when all other options must be rejected in favor of one. Shepard (1964, cited in Payne, Bettman & Johnson, 1992, p. 91) expressed it well: "Conflict among values arises because decisions generally involve a choice among options where no option best meets all of our objectives. Conflict has long been recognized as a major source of decision difficulty."

Experimental support for the notion that participants feel they have more freedom of choice when they have expended more cognitive effort comes from Jellison and Harvey (1973). These researchers manipulated the difficulty of the decision for participants by varying the similarity of the available options. They noted that participants undertook more cognitive analysis when options were similar in attractiveness, and therefore harder to choose among, than when they were dissimilar. Participants also reported feeling they had more choice under these conditions. It may be the case, therefore, that increasing the difficulty of a decision by increasing the number of available options may result in greater amounts of cognitive analysis and higher ratings of perceived freedom of choice.

Even if we can be reasonably sure that there is a positive relationship between number of options and PFC, this does not tell us anything about the strength or form of the relationship. Draughon (1978) hinted that it may not be strictly linear, speculating that people might feel more free as their number of options increases only "up to some number" (p. 32). Because perceived freedom of choice is a subjective experience, we cannot assume that it will increase proportionally with objective indicators such as the number of options or selections. As early as the 1800s, Weber and Fechner demonstrated

non-linear relationships between the mind and the material world through their work in sensory physiology and psychophysics (c.f., Fechner, 1860). Some researchers have suggested that the methods used in psychophysics can also be usefully applied to the study of social phenomena (e.g., Stevens, 1966). Latané (1981), in proposing his theory of social impact, reviewed a number of studies demonstrating non-linear relationships between, among other things, number of people in an audience and performance anxiety, number of elevator passengers and helping behavior, and number of people in a dinner party and tipping. Typically, the relationship between the number of people and their impact on the behavior in question takes a negatively accelerated form; the impact of any additional person tends to decrease steadily as the total number of people increases. Latané compares the effect to one commonly recognized in economics as the marginally decreasing value of money (otherwise known as the law of diminishing returns). An increase from \$5 to \$10 is experienced as more significant than an increase from \$105 to \$110, for instance, even though in both cases the amount has increased by five dollars. In a similar way, we might speculate that an increase from 10 options to 20 would result in a greater rise in PFC than an increase from 30 options to 40, even though in both cases the number of options has increased by the same amount. The rate of increase in PFC may eventually level off as the number of options increases, describing an asymptotic relationship between the variables. There may, in fact, be a number of options beyond which decision makers feel that any more is a waste at best and a confusing or overwhelming irritation at worst.

Variable 2: Number of selections

The effect of number of selections on perceived freedom of choice has not as yet been directly investigated. There have, however, been a couple of experiments to examine the effect of this variable on consumer decision-making processes. This is important to study, Abdul-Muhmin (1999) suggests, because there are many situations in life in which more than one of the available options are selected by a decision maker. These include, for example, subscriptions to television channels, books and magazines, vacation destinations, and food items at a restaurant. Abdul-Muhmin also cites evidence that choosing multiple items is more difficult for the decision maker than choosing a single item. This is perhaps because in multiple-item choices, several subdecisions must be made, future preferences must be predicted when some of the items are to be used later, and each alternative has to be evaluated in relation to other alternatives to ensure that choices complement one another. In single-item choice decisions, Abdul-Muhmin adds, the objective is to select the “best” or “most satisfactory” alternatives. In multiple-item choice decisions, the objective is to select the “best subset” or “most satisfactory subset” of alternatives. The decision maker may try to balance or “round out” the alternatives selected. Alternatives are therefore not evaluated independently, but in terms of their contribution to overall utility of the entire set selected. For multiple-item choice decisions, difficulty should therefore increase as the number of items to be selected increases.

Abdul-Muhmin looked specifically at how information-search behavior differed between single-item choice decisions and multiple-item choice decisions. He also

investigated whether the particular number of items in a multiple-item decision affected information search. Participants selected 1, 3, 5 or 7 vacation destinations out of 10. Abdul-Muhmin found differences between single-item groups and all other groups in depth of information search and type of search strategy used, but not among the three multiple-item groups. "In examining the effect of number of alternatives to be selected on decision processes," he concluded, "the most important distinction is that between single-item and multiple-item choices rather than the specific number of items to be selected." (p. 107)

McClelland, Stewart, Judd and Bourne (1987) also compared the effects of single-item versus multiple-item decision making on consumer decision-making processes. They looked at the extent of information processing for participants choosing 1 car versus 3 cars from a set of 15. Based on some major attributes, three of the cars were obviously superior to the rest, making the task easy for participants in the choose-3 group. Participants in the choose-1 group, on the other hand, should have a harder time making the choice. After eliminating all but the best three cars, these participants would have to pay attention to the minor attributes of those remaining to winnow their choice down to one. McClelland et al. predicted that this extra processing would be reflected in a greater memory for the minor attributes of the three best cars in the choose-1 group than in the choose-3 group, and this is precisely the result they obtained.

Based on these studies, we might expect that increasing the number of selections increases perceived freedom of choice, especially if decision difficulty and cognitive effort are related to PFC as some researchers (discussed previously) have suggested. And,

as with the number of options, the law of diminishing returns may also operate on the number of selections, causing an initial sharp increase in PFC to be followed by a gradual leveling off as the number of selections increases.

Satisfaction

Many of the ways in which freedom has been defined suggest that it is intimately tied to the satisfaction of wants or needs. Bertrand Russell, for instance, defined freedom as “the absence of obstacles to the realization of desires” (quoted in Dewey & Gould, 1970, p. 78). That perceived freedom of choice is at least partly a function of satisfaction is also suggested by Steiner’s (1970) idea of “outcome freedom”. Recall that according to Steiner, outcome freedom is the perception that one has a reasonably high probability of obtaining a desired outcome in a decision-making situation. Anything that increases this probability will therefore increase perceived outcome freedom, and so, he argues, will anything that increases the value (or desirability) of the outcome. Draughon (1978) expresses a similar idea with the statement “A person is more free with one acceptable option out of n than if all n options are unacceptable, and more free still as the utility of that option increases” (p. 33).

A second purpose of this study will be to investigate the effects of the two independent variables, (1) number of options and (2) number of selections, on a decision maker’s satisfaction. At first glance, the relationship between options and satisfaction appears to be a simple one; as the number of options increases, so, by consequence, will the chances that there will be more variety among them. Under these conditions, there should be a higher probability that the decision maker will find something he or she likes.

If the decision maker is able to find something highly desirable among the options, satisfaction with the outcome will likely be higher. However, there has been some suggestion that regret over foregone options may modify this relationship (Steil, 1993). Consider a contestant who has won a car on a game show. Satisfaction will probably be very high. But if that person is suddenly presented with a second car and asked to choose between the two, the situation becomes more complicated. Both cars have their own unique combination of features. Whichever car the person chooses, there will be features he or she has to forego by not choosing the other car. The regret associated with giving up those features may diminish the satisfaction with the car chosen. This is the idea expounded in Steil's Regret Theory, which states that the utility of an outcome includes not just its intrinsic worth for the decision maker, but also an amount related to the regret associated with knowing what would have happened if another choice had been made. As the number of options increases, the regret associated with having to give up more and more features of other options may therefore decrease the utility of an outcome. However, it is not clear from Steil's discussion of Regret Theory exactly how regret should affect a decision maker's satisfaction. Will reduced utility cause satisfaction to be completely nullified, or simply reduced? It is difficult to imagine that regret over lost opportunities would be so great as to completely erase the satisfaction over that which is gained. It is probably safe to expect, therefore, that the decision maker's satisfaction will rise with increasing numbers of options.

The situation with number of selections is similar. A decision maker who can select more than one item should have a higher probability of finding a satisfactory

combination of features than a decision maker who is limited to selecting only one.

Furthermore, as Abdul-Muhmin (1999) points out, being able to choose more than one item allows for more variety, which can address uncertainty as to what future preferences will be, satisfy needs for novelty and change, and resolve decision conflict. Having more selections also means that fewer items are rejected when making a decision, and so regret over foregone items should not be an issue. It is reasonable to expect, therefore, that increasing the number of selections will also increase satisfaction.

Options versus selections

If both the number of options and the number of selections have an effect on perceived freedom of choice and satisfaction, the next question one might ask is which has more of an effect? Does PFC increase more when the number of options is increased or when the number of selections is increased, for instance? Does the relationship also hold for satisfaction or is it reversed? Does one of the independent variables have a greater effect on both PFC and satisfaction than the other independent variable?

There have been no studies directly comparing the effects of number of options and selections on PFC or satisfaction. Some possible effects may be predicted, however, by looking at items in terms of collections of features, any of which may be desired or not desired by a decision maker. In McClelland et al. (1987) for instance, participants selected cars based on information they were given about the cars' attributes, or features. We might assume that in selecting an item, decision makers attempt to maximize the percentage of desired features they obtain. Increasing either the number of options or the number of selections should increase, by consequence, the probability that a decision

maker will obtain more of the desired features. In the case of options, increasing the number increases the chances there will be at least one option among them with a given number of the desired features. In the case of selections, increasing the number allows the decision maker to select a combination of items that will maximize the number of desired features obtained. But which is more effective at increasing the total number of desired features?

As part of the present study, a computer simulation, described in detail below, was developed to test this question. Briefly, it was found that increasing the number of selections resulted in a greater number of desired features for the decision maker than did increasing the number of options by the same proportion. Based on this finding, one might predict that participants will be more satisfied when their selections are increased relative to when their options are increased. And if satisfaction is linked closely to PFC, as suggested earlier, then participants should also feel they had more freedom of choice under those conditions.

The present study

The main purpose of the present study was to investigate the relationship between perceived freedom of choice (PFC) and each of two factors: (1) the number of items a decision maker can choose among, or “options”, and (2) the number of items a decision maker can choose, or “selections”. A second purpose was to examine the relationship between each of these factors and the decision maker’s satisfaction. Finally, the relative extent to which each of these variables influences PFC and satisfaction was investigated. The study was comprised of three parts, with the computer simulation mentioned earlier

being the first. As explained previously, the simulation was developed to test which is more effective in terms of giving a decision maker a greater number of desirable features—increasing options or increasing selections. The results of the simulation were then used to predict which of these variables would result in higher PFC and satisfaction for real participants in two laboratory decision-making tasks, Experiment 1 and Experiment 2.

The task employed for investigation in both of Experiments 1 and 2 provided a common decision situation for students—choosing courses in an undergraduate program. Options and selections were manipulated in the following ways:

- 1) Options: by varying the number of courses on the list from which the student could choose electives (10, 20, 30 or 40)
- 2) Selections: by varying the number of electives a student could choose (1, 2, 4 or 8).

When participants must choose among a number of items, as in the current study, there exists the concern of keeping the attractiveness or desirability of the items constant across participants. Because every participant will have different preferences and will value different features of an item, it can be difficult to know whether any observed effects are due to variations in the numbers or to variations in perceived attractiveness of the items. A possible solution to this problem may be to simply tell participants how many items they must choose, and how many they must choose among, without giving them any information about the actual items themselves. This was the approach taken in Experiment 1. Participants were told only how many course options and electives each academic program offered, but they were not told what the actual courses were. Their

ratings of PFC and satisfaction in Experiment 1 were therefore based solely on the program structure rather than on program content.

The problem with this approach, however, is that it may be too abstract to be very meaningful for participants. In addition, participants did not actually choose courses in this task, but were told to simply imagine they would be choosing courses. This means that, strictly speaking, Experiment 1 did not involve a true decision-making situation. To address these concerns, Experiment 2 included an experiment in which participants had concrete information about the courses they could choose among (i.e., course titles and descriptions), and they were able to make their selections before rating their PFC and satisfaction. By including both designs, I was able to determine to extent to which my findings generalized across both types of situations.

For both of Experiments 1 and 2, I examined the relationship between each of the two independent variables, options and selections, and

1. Perceived freedom of choice (PFC)
2. Satisfaction with the program
3. Satisfaction with the number of options, and
4. Satisfaction with the number of selections.

In Experiment 2, in which participants made choices among courses, I also examined the relationship between each independent variable and average satisfaction with the courses chosen. In addition, because some of the reviewed literature suggests that there are relationships between PFC and perceived difficulty of a decision, cognitive effort expended, and time taken to make a decision, I measured these variables in Experiment 2.

The main predictions for the two experiments were as follows:

1. There will be a monotone increasing, negatively accelerated relationship between each independent variable (options and selections) and perceived freedom of choice, with an initial relatively high rate of increase in PFC being followed by a slower rate of increase as the number of options or selections becomes greater.
2. There will also be a monotone increasing, negatively accelerated relationship between each independent variable and each satisfaction measure.
3. Based on the simulation results, selections will have a greater effect on PFC and satisfaction than options. Increasing the number of selections will be associated with higher increases in the dependent measures than increasing the number of options by the same proportion.

In addition, because past research has suggested that time taken to make choices, difficulty of choice, and cognitive effort are positively associated with PFC, I expect to find this pattern of results in Experiment 2.

The Simulation

A computer simulation was written to assist in making predictions about the effects of number of options and selections on perceived freedom of choice and satisfaction (Thorngate, 2000). The simulation was based on the assumption that in a decision-making situation, the desirability of each item is a function of how many of its features the decision maker wants. Thus, for example, an item with five of 10 wanted features is more desirable than an item with only three such features.

If a decision maker's options (i.e., items or alternatives) are increased, the probability that there will be at least one among them with a given number of desired features should be greater. On the other hand, increasing the number of selections allows the decision maker to choose a combination of items that will maximize the number of desired features obtained. Each method should therefore increase the percentage of desired features gained, but which method will increase this percentage more? The present simulation was developed to answer this question. Also of interest was whether the relationship of options and selections to percentage of desired features obtained would be similar to that predicted for perceived freedom of choice and satisfaction. Specifically, does the percentage of desired features obtained increase in a negatively accelerated relationship as options or selections increase?

Method

The simulation was written in Matlab (code reproduced in Figure 1). Matrices of random numbers between 0 and 1 were used to represent options and their features; each row represented one choice option and the columns represented their features.

A 10 X 20 matrix, for example, would mean that there were 10 options, each possessing 20 features. In line 1 of the program, the number of features possessed by each option is specified. Line 2 specifies the average percentage of those features that will be desired by the decision maker (pdf). For this study, these numbers were kept constant at 20 features and pdf = .01. In preliminary tests of the simulation, varying these numbers did not affect the relative position or shape of the curves obtained.

```

1) nf=input('How many features are in each option? ');
2) pdf=input('What % of desired features does each option have? ');
3) for opt=[10 20 30 40]; % number of options
4) for sel=[1 2 4 8]; % number of selections
5) nfsat=zeros(1000,1);
6) for trial = 1:1000
    7) options=rand(opt,nf)<=pdf; %generate the options
    8) ndf=sum(options'); %get # of desirable features for each option
    9) [junk,rank]=sort(ndf);
    10) result=options(rank(opt-sel+1:opt),:);
    11) result=[result;zeros(1,nf)]; %add extra row of zeros as
        workaround for sel=1
    12) x=sum(result);
    13) z=(x>=1);
    14) nfsat(trial)=sum(z);
15) end
16) opt,sel %show number of options and selections
17) percent_satisfied=sum(nfsat)/nf/10 % show percent of features
    satisfied by choice(s)
18) end
19) end

```

Figure 1. Simulation to determine the effects of options and selections on percent of desired features obtained by a decision maker (Thorngate, 2000).

Lines 3 and 4 indicate the number of options (10, 20, 30, 40) and selections (1, 2, 4, 8) being tested. The program ran through 16 iterations, one for each combination of options and selections. The first iteration included 10 options and 1 selection, for instance, the second had 10 options and 2 selections, and so on up to the sixteenth iteration, which had 40 options and 8 selections.

Within each of the 16 iterations there were 1000 trials representing 1000 separate decision making situations. On each trial (lines 6-15), the program

1. generated a matrix of random numbers representing the options and their features,
2. located the desired features within each option; a desired feature was simply one in which the random number generated was less than or equal to the specified pdf,
3. calculated the number of desired features obtained by the best 1, 2, 4, or 8 options, depending on which iteration the program was running, and
4. displayed the average percentage of desired features obtained in the 1000 trials.

Results

The results of the simulation are graphed in Figure 2. It is clear that as options or selections increase, the percent of desired features obtained increases. It is also clear that this relationship is a negatively accelerated one; the rate of increase in features obtained decreases as the number of options or selections becomes greater. Of particular interest is the fact that increasing selections has more of an effect on the percent of desired features obtained than does increasing options by the same proportion. As selections double from 1 to 2, for instance, the average relative increase in desired features is 65%, but it is only 16% as options double from 10 to 20. Similarly, the average relative increase is 46% from 2 to 4 selections but only 10% from 10 to 20 options.

Figure 2. Simulation results for effects of options and selections on percent of desired features obtained by a hypothetical decision maker.

The dependent measure in the simulation, percentage of desired features obtained, differs from the dependent measures in Experiments 1 and 2 to follow. In those experiments my main measures of interest are perceived freedom of choice and satisfaction. However, as discussed in the Introduction, close links have been suggested in the literature between perceived freedom, satisfaction, and the fulfillment of desires. If we assume that perceived freedom and satisfaction increase monotonically with the number of desired features obtained when making a choice, the simulation results can serve as a model of how real people in a decision making situation should respond. The simulation can therefore be used to support my predictions that (1) increasing options or selections will increase perceived freedom of choice and satisfaction, (2) this relationship will be a negatively accelerated one, and (3) selections will have more of an effect on perceived freedom of choice and satisfaction than options.

Experiment 1

Method

The purpose of Experiment 1 was to investigate how participants responded when they had only abstract numerical information about the academic programs presented to them. Participants did not view course descriptions or choose courses in this experiment, but simply provided ratings of perceived freedom of choice and satisfaction based on the number of options and selections available.

Participants

Twenty three undergraduate students, 19 females and 4 males, were recruited through notices on bulletin boards and by word of mouth. All students were given course credit in exchange for their participation.

As revealed by a pre-experimental background questionnaire (Appendix B), the range of ages was 19 to 25 years old, with an average age of 20. Sixteen of the participants (69.6%) were in the first year of their program, 6 were in their second year, and 1 participant was in the fourth year. Eighteen of the participants were social science or humanities majors and two were science majors. The most common disciplines represented were criminology (6 participants) and psychology (3 participants). Three of the participants had not yet declared a major. Fourteen participants (60.9%) had no knowledge of how many required courses and electives their current program offered. The 9 participants (39.1%) who did have this information reported an average of 5.2 required courses (range of 2.5–12) and 3.7 electives (range of 0.5–8.5). None of the 23 participants knew how many course options were available to them. Thirteen of the

participants reported having at some point sought help in selecting courses from a professor or academic advisor; the remaining 10 participants had never sought such help.

Design

The two independent variables for this experiment were

1. Number of courses to choose among (Options: 10, 20, 30 or 40), and
2. Number of electives, or courses the student could choose based on his/her own interests (Selections: 1, 2, 4, or 8).

Each of these two variables were represented by four levels of a 4 X 4 completely within-subjects factorial design. Each participant provided four ratings in each of the 16 cells of the design: one rating of perceived freedom of choice and three different ratings of satisfaction, described in the section on dependent measures below. The order of presentation of the 16 conditions was re-randomized for each participant.

Measures

Dependent measures. There were four dependent measures for this experiment:

1. Perceived freedom of choice (PFC)
2. “Program satisfaction”, or satisfaction with the program (SatProg)
3. Satisfaction with the number of courses to choose among, or options (SatOpt), and
4. Satisfaction with the number of electives, or selections (SatSel).

SatProg was a general satisfaction measure that attempted to get at participants’ overall impressions of each academic program. Participants were advised to consider all aspects of the program, including the number of academic credits needed, the number of course options available, and the number of electives vs. required courses. SatOpt and SatSel

were more specific measures, each looking at a separate, independent element of the academic programs. They served mainly as checks to ensure that the manipulations had the intended effect. As options were increased, it was expected that SatOpt would also increase but that there would be little effect on SatSel. Conversely, increasing selections was expected to boost SatSel but not SatOpt.

Participants provided their ratings on paper using scales ranging from 0 to 100, where 0 was low freedom of choice or satisfaction and 100 was high. (See the questionnaire in Appendix A for a copy of the scales.)

Experimental questionnaire. A 9-page questionnaire was used to gather the data for this experiment (Appendix A). The first page included instructions for filling out the questionnaire, and each of the remaining pages described two hypothetical academic programs, with each program followed by rating scales for the dependent measures. The description of an academic program included (1) the total number of credits needed for the program, (2) the number of required courses versus the number of electives, and (3) the number of course options the student had available from which to choose the electives. No other information was given about the programs, and participants in this experiment did not see any course titles or descriptions.

Background information. A short questionnaire (Appendix B) was used to obtain background information about participants that might be relevant to the study. Participants were asked to indicate their age, sex, major subject, year of study, and the number of electives and required courses included in their current program. The

questionnaire also asked participants whether they had ever sought help in choosing courses from a professor, academic counselor or advisor.

Procedure

The experiment was conducted in a small classroom of the Loeb Building, Carleton University. The participants took part in this experiment in groups; there was one group of 11 participants and another group of 12. Upon arriving, participants were welcomed and introduced to the study in the following manner:

“My study looks at academic decision making. I am trying to determine what students prefer in terms of the number of electives and course options offered in an academic program. I will be giving you a questionnaire showing you 16 different kinds of academic programs. You will be asked to simply provide ratings of how you feel about the various programs. The study will take approximately half an hour.”

Before beginning the experiment, participants were asked to sign an informed consent form (Appendix C-1) and told that they could cancel their involvement in the study at any time (none did). I then asked participants to fill out the background questionnaire. When everyone in the group had finished this task I introduced the experimental questionnaire with the following preamble:

“As you may already know, most universities require you to have 10 full credits in your major subject area to earn an undergraduate degree. Some of these 10 credits will be required courses, or courses the university says you must take. The remainder will be electives which you can choose

yourself based on your own interests. Programs vary widely in the number of required courses versus the number of electives. In some programs, the university decides most of the courses for you, and you don't get to pick many of them yourself. In other programs, you get to pick a lot of the courses yourself. In addition, some programs give you a lot of courses to choose among, while others give you a much smaller number from which to choose."

I then read aloud to participants the instructions for completing the questionnaire (Appendix A). If anything was still unclear to the participants, I provided clarification. I urged participants to take as much time as they needed to complete the questionnaire; however, I also mentioned that when providing ratings they should give their first impressions rather than trying to mathematically determine what the answer "should" be. I explained that there were no right or wrong answers and that they should answer according to how they felt personally about the different programs presented. Upon completion of the experiment, participants were thanked for their involvement and given a debriefing form (Appendix D-1).

Results

A major prediction in this study—that perceived freedom of choice (PFC) and satisfaction would increase in a negatively accelerated pattern as options or selections increased—was based partly on the computer simulation carried out as the first component of this study. The simulation was also the basis of the prediction that selections would have relatively more of an effect on perceived freedom and satisfaction than options. In fact, the simulation can be used as a mathematical model to specify precisely the expected relationship between the variables. The experimental results can then be compared with the model to determine how well the data obtained fit with the model's predictions.

The results of the simulation and the results for PFC in Experiment 1 are reproduced together in Figures 3a and 3b. It is clear from visual inspection of the curves that the simulation predicted very well the results of Experiment 1 for the PFC measure. Although PFC provided the best match with the simulation, the results for the three satisfaction measures also matched the simulation model very closely, as the Ordinal Pattern Analysis reported below will indicate. It may seem surprising that PFC matched the model more closely than any of the other measures, given that percent of desired features obtained sounds more like satisfaction than like perceived freedom of choice. This provides support for the notion, introduced earlier in the literature review, that PFC and satisfaction may be closely related concepts.

The extent of agreement between the experimental results for all measures and the simulation model was quantified using a non-parametric statistical technique called

Figure 3a. Simulation results (reproduced from Figure 2).

Figure 3b. Experiment 1: Results for perceived freedom of choice (PFC).

Ordinal Pattern Analysis (OPA, Thorngate, 1987; Thorngate & Carroll, 1988). In OPA, experimental observations are compared directly with the model to create an Index of Observed Fit (IOF), a number ranging from -1 to 1. An IOF close to 0 suggests that any agreement between the model and the experimental results was likely caused by chance. OPA works by matching all possible pairs of comparable means to determine whether they follow the same ordinal pattern. For example, according to the simulation model in Figure 3a, the mean at 10 options and 1 selection is lower than the mean at 10 options and 2 selections. If we look at the experimental results in Figure 3b we see that this is also the case. Because the two pairs follow the same ordinal pattern—the lower mean in the model is also the lower mean in the experimental results—then this is counted as a “hit”. If they did not follow the same pattern it would be counted as a “miss”. In the present study, the ordinal predictions based on the simulation were:

For options:

10 < 20, 10 < 30, 10 < 40

20 < 30, 20 < 40

30 < 40.

For selections:

1 < 2, 1 < 4, 1 < 8

2 < 4, 2 < 8

4 < 8.

The six comparisons for each variable were repeated at each level of the other variable, for a total of 48 comparisons for each dependent measure. IOFs were calculated from the number of hits and misses observed according to the following formula:

$$\text{IOF} = (\text{no. of hits} - \text{no. of misses}) / (\text{no. of hits} + \text{no. of misses})$$

The IOFs for each of the dependent measures in Experiment 1 are listed in Table 1.

Table 1

Experiment 1: Indexes of Fit (IOF) indicating extent of agreement of experimental results with computer simulation

Measure	Options	Selections
PFC	.917	1.00
SatProg	.833	.750
SatOpt	.917	.417
SatSel	.750	.917

In addition to the Ordinal Pattern Analysis, four two-way repeated measures ANOVAs were conducted to test the effects of options and selections on PFC and each of the three satisfaction measures. As summarized in Table 2, there were no significant interactions but all of the main effects were significant, supporting the prediction that options and selections would influence participants' PFC and satisfaction.

As can be seen in Figure 4a, the main effects of options show the expected negatively accelerated pattern of results. The initial rise in each of the dependent measures between 10 and 20 options is greater than the rise between 20 and 30 options, which is in turn greater than the rise between 30 and 40 options. The results for selections (Figure 4b), deviate only slightly from this predicted pattern. The curves for all four dependent measures increase sharply from 1 to 2 selections, as predicted, but they

continue to increase at about the same rate between 2 and 4 selections before decreasing or leveling off between 4 and 8 selections.

As expected, the variable options had a large effect on satisfaction with the number of options (SatOpt) but little effect on satisfaction with the number of selections (SatSel). Similarly, the variable selections had a large effect on satisfaction with the number of selections but little effect on satisfaction with the number of options.

Table 2

Experiment 1: F values for perceived freedom of choice and satisfaction with the program, number of options, and number of selections

Measure	Options main effect	Selections main effect	Interaction
PFC	$\underline{F}(1, 22)^a = 11.396^*$	$\underline{F}(3, 66) = 95.515^{**}$	$\underline{F}(1, 22)^a = 0.941$
SatProg	$\underline{F}(1, 22)^a = 8.142^*$	$\underline{F}(1, 22)^a = 17.597^{**}$	$\underline{F}(9, 198) = 1.018$
SatOpt	$\underline{F}(1, 22)^a = 33.131^{**}$	$\underline{F}(1, 22)^a = 3.924^b$	$\underline{F}(1, 22)^a = 1.382$
SatSel	$\underline{F}(3, 66) = 3.719^*$	$\underline{F}(1, 22)^a = 27.144^{**}$	$\underline{F}(1, 22)^a = 1.115$

^aLower-bound correction factor applied to df due to violation of sphericity assumption.

^bMarginally significant at $p = .06$. With less conservative Greenhouse-Geisser correction (df = 2, 52.78), significant at $p < .05$.

****** $p < .001$. ***** $p < .01$.

Figure 4a. Experiment 1: Main effects of options.

Figure 4b. Experiment 1: Main effects of selections.

It is clear from the graphs that the shapes of the curves resemble one another to a large extent. Correlation coefficients were calculated to determine the extent to which PFC and each of the three satisfaction measures were related to one another. Under the heading “Bivariate correlations”, Table 3 includes coefficients calculated by correlating the ratings in all 16 conditions, without regard to group membership. Because there was some concern that manipulation of the variables might distort coefficients calculated in this way, they were also calculated separately for each of the 16 conditions and then averaged. These latter coefficients are reported under the heading “Pooled within-cell correlations” in Table 3. Regardless of which correlations we consider, there was a moderate to high positive correlation between most of the measures. Most striking were the correlations between perceived freedom of choice and program satisfaction (PFC and SatProg), and between program satisfaction and satisfaction with the number of selections (SatProg and SatSel).

Given that both of options and selections had effects on PFC and satisfaction, a question of interest is what were the relative magnitudes of these effects? Did selections have more of an effect than options, as predicted by the computer simulation? Omega squares reproduced in Table 4 suggest that, for PFC and program satisfaction (SatProg), this was in fact the case. In both instances, selections accounted for more of the variance than options (Omega squares were an average of 17 times larger for selections than for options). Figures 4a and 4b show very clearly that selections had far more of an effect than options. As in the computer simulation, the rate of increase in PFC and program satisfaction is much lower as options double from 10 to 20, or from 20 to 40 than when

selections double from 1 to 2, or from 2 to 4. As predicted, selections also accounted for more of the variance in satisfaction with number of selections (SatSel), while options accounted for more of the variance in satisfaction with number of options (SatOpt).

Table 3

Experiment 1: Intercorrelations for PFC and the three satisfaction measures

Measure	PFC	SatProg	SatOpt	SatSel
Bivariate correlations^a				
PFC	--	.735**	.372	.573*
SatProg		--	.343	.848**
SatOpt			--	.525*
SatSel				--
Pooled within-cell correlations^b				
PFC	--	.676	.292	.456
SatProg		--	.332	.726
SatOpt			--	.194
SatSel				--

^aSimple correlations reported by SPSS, without regard to experimental condition.

^bPooled correlations between variables in each of 16 experimental conditions (z-transformed). Significance levels for pooled correlations unavailable.

** $p < .001$. * $p < .01$.

Table 4

Experiment 1: Omega squares estimating proportion of variance accounted for by options and selections

Measure	Options		Selections	
	10, 20, 30, 40	10, 20, 40 ^a	1, 2, 4, 8	1, 2, 4 ^b
PFC	.03	.04	.58	.52
SatProg	.02	.03	.29	.43
SatOpt	.32	.36	.02	.02
SatSel	.01	.01	.41	.53

^aConditions with 30 options were removed from the analysis.

^bConditions with 8 selections were removed from the analysis.

Of course, it is possible that the relatively large proportion of variance in PFC and program satisfaction accounted for by selections simply reflects the fact that selections doubled three times as they increased from 1 to 8, whereas options only doubled twice as they increased from 10 to 40. To test whether this was the case, an additional 3 X 3 ANOVA was performed including only three levels of each variable: 10, 20, and 40 options and 1, 2 and 4 selections. In this way, the variables were equated on the number of times they doubled. As can be seen in Table 4, the same direction of results was obtained as in the full analysis. Selections still accounted for a greater amount of the variance in PFC, program satisfaction, and satisfaction with the number of selections; options still accounted for a greater amount of the variance in satisfaction with the number of options.

Because of the nature of the design for this experiment, it is possible that participants responded not just to the raw numbers of options and selections, but also to the proportions represented by these numbers. For example, consider a participant with 10 options and 1 selection, another participant with 20 options and 2 selections, and a third participant with 40 options and 4 selections. The proportion of the available items they can choose is $1/10$ in all cases. There were also three experimental conditions in which the proportion $1/5$ was represented, two conditions in which the proportion $1/20$ was represented, and two conditions in which the proportion $2/5$ was represented. Significant interactions between options and selections would have been a first indication that proportions did make a difference to participants, but as already reported no significant interactions were found. In order to test further whether participants were responding to proportions, a series of one-way ANOVAs were carried out to compare the means of conditions in which the same proportions were represented. If participants were responding to proportions rather than raw numbers, the means should not differ significantly from one another. However, nearly all of the ANOVAs were significant at the .01 level or higher (see Table 5), indicating that the means were different. (The only exceptions were SatProg and SatSel in the conditions representing $2/5$ proportions.) This suggests that participants were responding at least in part to the raw numbers rather than entirely to the proportions represented by them.

Table 5

Experiment 1: Results of one-way ANOVAs on experimental conditions representing the same proportions

Measure	Proportion represented							
	1/10		1/5		1/20		2/5	
	Means	F value ^a	Means	F value ^a	Means	F value ^a	Means	F value ^a
PFC	17.48		36.52		22.70		57.17	
	40.65	54.44**	67.52	42.34**	44.61	24.41**	81.65	29.67**
	73.00		87.78					
SatProg	28.61		38.91		31.09		59.35	
	40.65	32.74**	67.83	13.01*	48.91	18.39**	66.96	1.17
	74.78		70.44					
SatOpt	38.65		33.83		53.48		43.04	
	58.04	17.21**	62.83	27.11**	75.65	10.24*	66.61	12.67*
	86.30		82.17					
SatSel	16.09		31.70		16.74		62.00	
	31.30	38.27**	69.00	16.12**	40.04	21.78**	71.74	1.62
	70.00		72.39					

^aDF = 1 and 22 for all variables (with Lower-bound correction factor).

**p < .001. *p < .01.

Because almost all of the participants were young female social science majors in their first year of study, it was not possible to examine the relationships between age, gender, major, or years in university and any of the dependent measures. It was possible, however, to determine whether participants who reported seeking help with academic decisions showed different patterns of results than those who reported never having solicited such help. ANOVAs performed on this data revealed that help seeking had no

bearing on responses to any of the other measures. Participants who sought help did not report significantly higher or lower PFC or satisfaction than other participants.

Experiment 2

Method

The purpose of Experiment 2 was to investigate how participants responded when they had concrete information about the academic programs available to them. Unlike Experiment 1, participants viewed course titles and descriptions and they chose courses in this experiment, making the task less abstract and more realistic.

Participants

Forty-eight participants, 30 females and 18 males, were recruited through notices on bulletin boards and by word of mouth. All of the participants were undergraduate students with the exception of one, a second-year master's student who volunteered to take part. The undergraduate students received course credit in exchange for their participation. The age range was 18 to 50 years old, but only 4 of the participants were older than 25. The average age was 21.4 years.

The pre-experimental background questionnaire revealed that 41 of the participants (85%) were in the first year of their program, and only 1 participant, the graduate student, was farther along than the third year. The most common disciplines represented were criminology (13 participants), psychology (9 participants) and commerce (7 participants). There were also 3 undeclared majors and 5 in the natural sciences, with the remainder being distributed across the social sciences and humanities. Twenty-seven participants did not know how many required courses and electives their current program offered. The 21 remaining participants who did know these numbers reported an average of 3.8 required courses (range of 1–10) and an average of

1.8 electives (range of 0–4). Only 7 participants knew how many course options were available to them; they reported an average of 3.4 course options (range of 0–9). Half the participants had sought help with course selection at some time in their lives and half the participants had never sought help.

Design

As in Experiment 1, the two independent variables for this experiment were

1. Number of courses to choose among (Options: 10, 20, 30 or 40), and
2. Number of electives (Selections: 1, 2, 4 or 8).

The experiment was conducted using a 4 X 4 fractionally replicated randomized block design. Each participant was tested 4 times in 4 different experimental conditions.

Participants were randomly placed in 4 of the 16 cells, with the following constraint: each participant appeared once and only once in every row and every column of the design.

Participant 1, for example, was placed in conditions represented by the following row-column combinations: 10 options and 8 selections, 20 options and 1 selection, 30 options and 2 selections, 40 options and 4 selections. Participant 2 was placed in the following combinations: 10 options and 2 selections, 20 options and 4 selections, 30 options and 8 selections, 40 options and 1 selection. The order of presentation of each participant's four assigned option-selection combinations was randomized to control for order effects. The number of participants in each cell of the design was 12.

Stimuli

Course descriptions. One hundred short descriptions of undergraduate psychology courses taken from North American university calendars were used (Appendix E). Efforts

were made to represent every possible subdiscipline within psychology and to include a wide variety of courses on the list. Course descriptions were presented to participants on a computer screen. The number of courses presented to the participant on any particular trial depended on the experimental condition being tested.

The computer program. A program written in Toolbook was used to carry out this experiment (see Appendix F for a printout of what was presented to participants). This allowed the process to be automated, ensuring consistency of presentation to participants and greater control in collecting dependent measures. A detailed description of how the program worked is given in the Procedure section.

Measures

Dependent measures. There were 8 dependent variables in this experiment:

1. Perceived freedom of choice (PFC)
2. “Program satisfaction”, or satisfaction with the program (SatProg)
3. Satisfaction with the number of options (SatOpt)
4. Satisfaction with the number of selections (SatSel)
5. “Course satisfaction”, or satisfaction with the courses chosen (SatChos)
6. Perceived difficulty of choosing the courses
7. Time taken to choose courses, and
8. Number of course descriptions viewed before choices were completed.

As in Experiment 1, SatProg measured participants’ overall impressions of each academic program while SatOpt and SatSel measured separate elements of the programs

and were used mainly as manipulation checks. SatChos measured satisfaction with the actual outcome of the decision, i.e., the courses chosen.

Participants provided their ratings by filling in scales presented to them on the computer screen at the appropriate times during the experiment (see page 113, Appendix F for a copy of the rating scales). Time taken to choose courses was measured automatically by the computer program from the moment the choices were presented to the participant to the moment he or she was finished choosing. The course descriptions viewed were also recorded automatically by the computer program.

Background information. The background questionnaire used in Experiment 1 was also given to the participants in this experiment (Appendix B).

Procedure

The experiment was conducted in Room A428 of the Loeb Building, Carleton University. Participants were tested individually, and each was randomly assigned to 4 of the 16 possible conditions according to the method described in the Design section. Upon arriving, participants were welcomed and given the following introduction to the experiment:

“My study looks at academic decision making. I am trying to determine what students prefer in terms of the number of electives and course options offered in an academic program. In a little while you will be doing a task on the computer screen. You will be choosing courses in a few different programs and then giving me some ratings indicating how you feel about it. The experiment should take about half an hour.”

Participants were then asked to sign an informed consent form (Appendix C-2) and were told they were free to cancel their involvement in the study at any time (as in Experiment 1, none did). Participants next completed the background questionnaire. Before participants began the computerized course selection task, I recited to them the same preamble as in Experiment 1 (see page 33). In addition, I reviewed with participants what they would see on the computer screen, using screen printouts from the program (Appendix F) to ensure that they understood fully how the experiment should proceed. I described in detail how they should go about selecting and deselecting courses, and how the rating scales were to be completed. I also explained that all the courses they would be viewing were psychology courses, and that they should therefore imagine they were majoring in psychology and just starting out in the program. Finally, participants were told that they would be viewing a total of four different programs over four trials, and that each trial should be treated independently of the others. Participants were encouraged to take as much time as they needed to complete the task.

The computerized task. As they began the computer task, participants were first presented with the screen of instructions on how to navigate within the program (page 110, Appendix F). On the next screen (pages 111-112) participants were presented with a list of course options to choose among. A message at the top of the screen indicated how many courses were on the list and how many courses the participant should choose (i.e., the number of electives). Participants viewed the course description corresponding to any course title by clicking on the title. Courses were selected and deselected by clicking on the “choose/unchoose it” button on the screen. As the participants made their selections,

the course descriptions they examined were recorded automatically by the computer program, as were the courses they finally settled on and the time taken to make their choices. When participants finished making their selections another screen appeared containing rating scales for participants to fill out by typing whole numbers between 0 and 100 into the boxes (page 113). The process of viewing a list of courses, choosing the desired electives, and providing ratings constituted one trial in the experiment. When a trial was completed by a participant, the program automatically proceeded to the next one until the participant had completed a total of four trials.

As mentioned previously, the courses presented to the participant on each trial were chosen at random by the computer program from the same pool of 100 courses. It should be noted here that each participant was presented with all 100 courses over the course of the four trials, and that none of the courses were repeated. For instance on trial 1, a participant in the condition containing 10 course options would have 10 of the 100 courses chosen at random and presented to him or her on the screen. Suppose that for trial 2, the same participant was in the condition containing 40 course options. In that case, 40 courses would be chosen at random from the 90 courses remaining in the pool after the 10 for the first trial had already been removed. On the third trial, the participant might receive another 30 courses chosen at random from the 50 remaining, and then receive the 20 courses remaining on the last trial. On completion of the computer task, participants were thanked for their involvement in the experiment and given a debriefing form (Appendix D-2).

Results

In Figures 5a and 5b on the following page, it is clear that the results of Experiment 2 do not match the computer simulation results as closely as those of Experiment 1. Nevertheless the match, with two exceptions, is still a good one, as is indicated by the IOFs calculated using Ordinal Pattern Analysis (Table 6).

Parametric statistical tests also indicated that, as in Experiment 1, options and selections did indeed have significant effects on perceived freedom of choice (PFC) and satisfaction. Five two-way between-subject ANOVAs were conducted to test the effects of these variables on PFC and each of the satisfaction measures. Just as in Experiment 1, there were no significant interactions but almost all of the main effects were highly significant (Table 7). One notable exception was that, contrary to the prediction that greater options or selections would result in higher ratings on all satisfaction measures, the effect of selections on course satisfaction (SatChos) was not statistically significant.

Table 6

Experiment 2: Indexes of Fit (IOFs) indicating extent of agreement of experimental results with computer simulation model

Measure	Options	Selections
PFC	.583	.667
SatProg	.667	.833
SatOpt	.917	0
SatSel	.583	.917
SatChos	.750	-.083

Figure 5a. Simulation results (reproduced from Figure 2).

Figure 5b. Experiment 2: Results for perceived freedom of choice (PFC).

Table 7

Experiment 2: F values for perceived freedom of choice and satisfaction with the program, number of selections, number of options, and courses chosen

Measure	Main effects ^a		
	Options	Selections	Interaction ^b
PFC	$\underline{F} = 5.958^{**}$	$\underline{F} = 10.338^{**}$	$\underline{F} = 1.444$
SatProg	$\underline{F} = 5.099^{*}$	$\underline{F} = 9.598^{**}$	$\underline{F} = 0.906$
SatSel	$\underline{F} = 3.402^{*}$	$\underline{F} = 24.216^{**}$	$\underline{F} = 1.254$
SatOpt	$\underline{F} = 21.124^{**}$	$\underline{F} = 0.312$	$\underline{F} = 0.886$
SatChos	$\underline{F} = 7.639^{**}$	$\underline{F} = 1.097$	$\underline{F} = 1.044$

^aDf for all main effects are 3 and 176.

^bDf for all interactions are 9 and 176.

** $p < .001$. * $p < .01$.

As can be seen in Figure 6a, the negatively accelerated relationships observed for the main effect of options in Experiment 1 are also observed here for PFC and all but one satisfaction measure. For the most part, a sharp initial rise in each dependent measure between the first and second conditions is followed by a slower rate of increase between subsequent conditions. The exception is satisfaction with the number of selections (SatSel), which deviates slightly from the pattern by leveling off between 20 and 30 options before resuming a negatively accelerated increase. In Figure 6b (Main effects of selections), PFC and program satisfaction (SatProg) also show this same temporary

Figure 6a. Experiment 2: Main effects of options.

Figure 6b. Experiment 2: Main effects of selections.

leveling off of the curve between 2 and 4 selections, while SatSel shows the expected negatively accelerated pattern.

The curves for satisfaction with the number of options (SatOpt) and with the courses chosen (SatChos), which were non-significant in the statistical analysis, appear almost flat in Figure 6b. As expected, options had a large effect on SatOpt but less of an effect on SatSel (Figure 6a). Similarly, selections had a large effect on SatSel but little effect on SatOpt (Figure 6b).

Of note is the fact that course satisfaction (SatChos) was consistently high, averaging no lower than 65 on the 100-point scale, even at the lowest numbers of options and selections. Furthermore, this measure was almost always higher than any of the other satisfaction measures, suggesting that participants were typically more satisfied with the courses than they were with other aspects of the programs.

As in Experiment 1, the curves for PFC and program satisfaction (SatProg) resemble one another to a very large extent, and many of the other curves also have similar forms. Correlation coefficients were calculated to determine the extent to which PFC and each of the four satisfaction measures were related to one another. To ensure that the experimental manipulations were not largely distorting the simple bivariate correlations, pooled within-cell correlations were also calculated and reported in Table 8. Correlations calculated by both methods show moderate to high positive correlations among all the variables, with the highest correlation occurring between perceived freedom of choice and program satisfaction.

Table 8

Experiment 2: Intercorrelations for PFC and the four satisfaction measures

Measure	PFC	SatProg	SatOpt	SatSel	SatChos
Bivariate correlations^a					
PFC	--	.804*	.600*	.597*	.415*
SatProg		--	.596*	.599*	.618*
SatOpt			--	.292*	.602*
SatSel				--	.262*
SatChos					--
Pooled within-cell correlations^b					
PFC	--	.796	.630	.560	.412
SatProg		--	.622	.636	.648
SatOpt			--	.406	.544
SatSel				--	.444
SatChos					--

^aSimple correlations reported by SPSS, without regard to experimental condition.

^bPooled correlations between variables in each of 16 experimental conditions

(z-transformed). Significance levels for pooled correlations unavailable.

* $p < .001$

As in Experiment 1, the magnitude of the effects of selections on PFC, program satisfaction, and satisfaction with the number of selections was higher than that of options, indicating that selections accounted for the higher proportion of the variance in these ratings (see Table 9). In this experiment, however, the differences between the

Omega squares were less pronounced than in Experiment 1, with selections accounting here for approximately twice as much of the variance in PFC and program satisfaction as options. Predictably, options accounted for more of the variance in satisfaction with number of options than did selections. As in Experiment 1, performing a 3 X 3 ANOVA on the data (with 10, 20 and 40 options and 1, 2 and 4 selections) did not appreciably change this pattern of results. Important to note is that selections accounted for none of the variance in course satisfaction.

Table 9

Experiment 2: Omega squares estimating proportion of variance accounted for by options and selections

Measure	Options		Selections	
	10, 20, 30, 40	10, 20, 40 ^a	1, 2, 4, 8	1, 2, 4 ^b
PFC	.06	.03	.12	.05
SatProg	.05	.03	.11	.10
SatOpt	.25	.21	.00	.00
SatSel	.03	.02	.26	.10
SatChos	.09	.07	.00	.01

^aConditions with 30 options were removed from the analysis.

^bConditions with 8 selections were removed from the analysis.

A series of one-way ANOVAs was carried out to compare the means of conditions representing the same proportions (1/10, 1/5, 1/20, 2/5). Similar to

Experiment 1, almost all of the ANOVAs were significant at the .05 level or higher (see Table 10), suggesting that participants were responding to the raw numbers rather than just to the proportions represented by them. One exception is course satisfaction (SatChos), which reaches significance at the proportion 1/10, but is non-significant at the proportions 1/5, 1/20 and 2/5. An examination of the means for this variable indicates that they all occur within a narrow range (satisfaction = 55.8–90.3), which may explain why no significant differences were found among the conditions tested. The only other exceptions were program satisfaction (SatProg), non-significant at proportion 2/5, and satisfaction with the number of selections (SatSel), non-significant at proportion 1/20.

Although there were no significant interactions obtained, a visual inspection of the interaction graphs for perceived freedom and program satisfaction (Figures 7a and 7b) revealed an effect that deserved further investigation. In both graphs, the first level of the variable selections displays a different pattern of results than the other three levels. While the curves for 2, 4 and 8 selections all increase as options increase, the curve for 1 selection increases initially between 10 and 20 options but then decreases. To test the significance of this effect, 2, 4, and 8 selections were combined into one level and the data were reanalyzed as a 2 X 4 design with 2 levels of selections (1 and >1) and 4 levels of options (10, 20, 30, 40). The interaction was significant for PFC in the new analysis ($F(3,184) = 3.371, p < .05$) but not for program satisfaction ($F(3,184) = 1.885, p > .05$). This indicates that, for PFC at least, the pattern of results when a decision maker has only one selection is different from the pattern when a decision maker has more than one selection. With just one selection, an increase in the number of options appears to cause

an initial rise but then a gradual decline in PFC. Perhaps decision makers become more aware of their limited choices as the number of options increases. While the ANOVA for program satisfaction was not significant, the graph suggests that the results are in a similar direction for that measure.

Table 10

Experiment 2: Results of one-way ANOVAs on experimental conditions representing the same proportions

		Proportion represented							
		1/10		1/5		1/20		2/5	
Measure	Means	F value ^a	Means	F value ^a	Means	F value ^b	Means	F value ^b	
PFC	42.83		51.67		49.83		41.08		
	55.00	3.92*	63.33	6.91**	73.75	4.49*	76.67	14.08	
	73.75		88.58					***	
SatProg	40.92		58.33		49.58		46.92		
	62.08	6.31**	64.17	3.91*	70.83	4.58*	66.67	3.83	
	75.00		84.08						
SatOpt	39.58		42.08		58.25		29.17		
	56.67	6.80**	57.92	7.61**	84.00	6.61*	54.17		
	83.33		85.00					4.20*	
SatSel	21.25		36.67		31.33		44.58		
	43.08	5.99**	68.33	15.26	44.92	1.17	75.58	7.14**	
	61.50		86.00	***					
SatChos	65.00		77.25		71.92		55.83		
	82.42	5.94**	74.17	1.05	81.58	1.24	65.00	0.69	
	90.25		86.83						

^aDF = 2 and 33 for all variables

^bDF = 1 and 22 for all variables

***p < .001. **p < .01. *p < .05

Figures 7a and 7b. Options X selections interaction for (a) perceived freedom of choice and (b) program satisfaction.

In a correlational analysis using pooled within-cell correlations, the number of course descriptions participants viewed before completing their choices, and the time it took them to make their choices, were both unrelated to PFC and each of the satisfaction measures. Not surprisingly, however, these variables were moderately correlated with one another ($r = .520$). There was also a low positive correlation between perceived difficulty of the decision and time taken to make choices ($r = .177$) and between perceived difficulty and the number of courses viewed ($r = .228$). Perceived difficulty also showed a low-to-moderate negative correlation with PFC and each of the four satisfaction measures (r s: $-.125$, $-.313$, $-.192$, $-.256$ and $-.419$). Also interesting to note is that the time participants took to make their choices, and the number of courses they examined while doing this, did not always increase proportionally with the number of

options or selections. In Figures 8a and 8b it is apparent that as the number of options or selections double, the time and number of courses viewed do not double.

Figures 8a and 8b. Main effects of options and selections on (a) time taken to make choices and (b) number of courses viewed.

The only observed differences between males and females were their course satisfaction and whether or not they had ever sought help in choosing courses. More of the females than the males reported seeking help with course selection at some time in their lives (57% vs. 39%; $F(1, 190) = 5.802, p = .017$). However, whether or not a participant had ever sought help was not significantly related to responses on any of the other measures. On average, females reported higher satisfaction with courses chosen than males (79.0 vs. 70.9; $F(1, 190) = 5.701, p = .018$). Perhaps this pattern of results suggests that females are better at getting what they like because they have received some instruction in how to do this in the past? Whether or not participants had knowledge of

their current program's number of electives and required courses was not significantly related to gender or to any of the other measures.

Discussion

The main purpose of this study was to investigate the effect of number of options and selections on a decision maker's perceived freedom of choice (PFC). A second purpose was to determine the effects of these variables on a decision maker's satisfaction. Based on previous findings in related areas, and on a computer simulation involving hypothetical decision makers, my predictions were that PFC and satisfaction would increase as options or selections increased, and that they would do so in a monotone increasing, negatively accelerated fashion. In addition, I predicted that selections would have more of an effect on PFC and satisfaction than would options.

There were four satisfaction measures in this study: satisfaction with (1) the program, (2) the number of options, (3) the number of selections, and (4) the courses chosen. Measures 3 and 4 served mainly as manipulation checks, and the results from these measures did indeed confirm the validity of the manipulations. As expected, manipulating options affected satisfaction with options more so than satisfaction with selections, while manipulating selections had the opposite effect. For ease of discussion, I will refer throughout the remainder of the discussion mainly to measures 1 and 4—program satisfaction and course satisfaction—except when I am writing in general about all four measures.

Two experiments were carried out to test the predictions. In Experiment 1 participants provided ratings based only on abstract, numerical information about the academic programs presented to them. In Experiment 2 participants had concrete information about the content of the courses in the programs, and they decided among

courses before providing their ratings. Because choices among courses were made only in Experiment 2, course satisfaction was measured only in that experiment.

The results generally supported the predictions. In both Experiments 1 and 2, PFC and program satisfaction increased as options or selections increased, and, for the most part, they did so in the predicted negatively accelerated manner. Furthermore, increasing selections had more of an effect than increasing options by the same proportion. Going from 1 to 2 selections boosted PFC and program satisfaction more than going from 10 to 20 options, for instance. Presumably, if we were to increase options by the same amount as selections (i.e., going from 1 to 2 selections and from 10 to 11 options), the superior effectiveness of manipulating selections would be even more pronounced.

An exceptional finding was that, in contrast to program satisfaction, course satisfaction followed the predicted pattern for options but not for selections. In fact, selections had no effect on course satisfaction, accounting for none of the variance in that measure. In other words, whether or not people were satisfied with their courses depended on the number of courses they could choose among, but not on the number of courses they could choose. In addition, for both options and selections, the average course satisfaction was consistently high (no lower than 65 on a 100-point scale), and was also consistently greater than program satisfaction.

These findings suggest that, in looking for determinants of satisfaction, it may be helpful to distinguish between the decision situation itself and the outcome of a decision. In the present study, the courses chosen constitute the decision outcome, whereas program satisfaction is more akin to satisfaction with the decision situation. Apparently,

it is possible for people to be satisfied with the outcome of a decision, even when they have not been that satisfied with the decision situation itself. This is reminiscent of the research on procedural versus distributive justice (c.f. Brockner & Wiesenfeld, 1996), which distinguishes between the fairness of a decision outcome and the fairness of the procedures that led to that outcome. It also fits nicely with Steiner's (1970) distinction between outcome and decision freedom, an approach that was not readily adopted by later researchers but perhaps should have been.

Having found that increasing options and selections increases PFC and satisfaction (with the exception just discussed), the obvious question is why? The literature reviewed earlier suggests several variables that may affect a decision maker's perceived freedom of choice, including cognitive effort expended (Steiner, 1970), difficulty of the decision (Jellison & Harvey, 1973), and time taken to make a decision (Harvey & Johnston, 1973; Harvey & Jellison, 1974). If increasing the number of options increases cognitive effort, decision difficulty, or time taken to decide, then we might expect it to also increase PFC. And if perceived freedom of choice and satisfaction are as closely linked as the literature suggests (e.g., Draughon, 1978; Steiner, 1970), then factors that increase PFC should have similar effects on satisfaction. As for selections, McClelland et al. (1987) and Abdul-Muhmin (1999) found evidence that choosing multiple items is more difficult than choosing one item. Similar to options, greater difficulty with more selections may lead to both greater PFC and greater satisfaction.

The results of the present study were not supportive of these ideas. Time was not significantly correlated with PFC or any of the satisfaction measures. Nor was the

number of courses examined before completion of choices, which might serve as a measure of cognitive effort expended. And perceived difficulty of the decision showed a low-to-moderate negative, rather than positive, correlation with these measures, suggesting that as difficulty increases, perceived freedom of choice and satisfaction may actually decrease.

If greater PFC and satisfaction are not caused by greater time, difficulty, or cognitive effort, then what might be their cause? In the introduction, I suggested the simple possibility that increasing either options or selections will increase the number of desired features obtained by a decision maker, and that this may increase perceived freedom of choice and satisfaction. This explanation, however, assumes it is the outcome of a decision that determines PFC and satisfaction. But in Experiment 2 of the present study, increasing the number of selections had no effect on ratings related to the decision outcome (i.e., ratings of course satisfaction). At first glance, this inconsistency seems to suggest that decision makers may not base their PFC or satisfaction on the outcome of a decision. On the other hand, it may be a simple consequence of the way in which options were presented to participants in this study. Participants were required to choose among academic courses, but the only information they had about the courses was the course descriptions. They were not given any information about other features of the courses, such as the professor, the time slot, and the like. Participants had, in effect, only one feature on which to base their decisions. Under those conditions, increasing the number of selections would be of little use in increasing the number of desired features obtained. It might be interesting to observe whether the number of selections would affect

satisfaction with the outcome of a decision if the options were presented in terms of collections of features. It might also be interesting to directly test the notion that increasing the number of desired features obtained increases people's PFC and satisfaction with a decision. Selections might be manipulated while holding the number of desired features obtained constant, for instance. Would people still feel a gain in PFC and satisfaction under these conditions? And if the number of desired features obtained did increase as the number of options increased, would options then account for more of the variance in PFC and satisfaction than selections?

Much of what has been written about perceived freedom of choice assumes that PFC and satisfaction are closely related, an assumption that is strongly supported by the current research. There were moderate to high positive correlations between PFC and each of the four satisfaction measures. PFC and program satisfaction were particularly closely related, with their curves virtually overlapping in the graphs. This suggests that participants may have found it difficult to distinguish between the two concepts, and that they may have even considered them to be the same thing.

It is interesting to speculate on what the relationship might be between PFC and satisfaction. Perhaps satisfaction is a necessary, if not sufficient, ingredient for PFC. Perhaps people cannot believe themselves to have freedom of choice if a situation gives them slim chances of being satisfied with their decision. Even if perceived freedom of choice and satisfaction are conceptually different, wherever satisfaction is low, PFC might also be low. But could it work the other way around? Could PFC possibly be a necessary ingredient for satisfaction? If we are talking about satisfaction with the

decision making situation itself (i.e., with the program), then this seems to make sense. Perhaps when people are satisfied with the situation, it is because the situation gives them more freedom of choice. This might be especially true of Experiment 1, in which participants had no information about the situation except the number of options and selections available. They could therefore base their satisfaction ratings only on these numbers, and on how much freedom of choice they felt these numbers gave them.

On the other hand, if we are talking about satisfaction with the outcome of a decision (or courses chosen), it is not as clear-cut. In Experiment 2, for instance, participants had more information about the situation; they had the opportunity to examine and choose among the options. This information, in addition to the information about the number of options and selections available, may also have affected their PFC and satisfaction ratings. Further research that attempts to tease out the relationship between perceived freedom of choice, satisfaction with the decision situation, and satisfaction with the outcome of a decision would be valuable.

The finding that almost all the curves followed the predicted monotone increasing, negatively accelerated pattern is also important to mention. The few deviations from this pattern were minor, and were likely due to sampling error. In a couple of cases, for instance, the curve temporarily leveled off before continuing its negatively accelerated ascent; in a couple more cases the curve increased at the same rate between the second and third levels as it had between the first and the second levels. Overall, however, the shapes of the curves suggest that the law of diminishing returns applies in decision making as it does in many other facets of life. These findings suggest

another instance of Fechner's (1860) law, which states that sensations follow a logarithmic curve in relation to physical stimuli. A limitation of the present study is that it cannot tell us whether the curves would continue in the same manner at greater numbers of options or selections. Of interest would be further research that expands these numbers to examine the effects.

Finally, the finding that one selection elicits a different pattern of results for PFC than do 2, 4, or 8 selections is intriguing. With multiple selections, PFC increases as options increase; but at one selection it decreases. This agrees with the results of Abdul-Muhmin (1999), who found that the process of making one selection differed from the process of making multiple selections, but who observed no differences among varying numbers of multiple selections. Together with his results, the present findings suggest that there is a conceptual difference between having just one selection and having more than one. It appears that when we can choose only one item, greater numbers of options only decrease our perceived freedom of choice. Once we move beyond having just one selection, however, increasing our options boosts our PFC in the negatively accelerated fashion described throughout this study.

One more suggestion for further research deserves mention. In the present study, when participants were asked to rate their PFC or satisfaction, they were not asked to indicate whether they believed they had too many options or selections, or too few. Low reported PFC or satisfaction could have therefore been a result of not having enough choice, or of having too much choice. Future research in which participants not only rated

their PFC and satisfaction, but also indicated whether they felt they had too few, enough, or too many choices would help to clarify this question.

For several reasons, as it is with most laboratory experiments, it may be difficult to generalize from the findings reported here to real-world situations. First, participants in this study did not actually become students in the courses they chose in the decision making task. It is questionable, therefore, whether course satisfaction can truly be considered equivalent to a decision outcome. Second, when participants were told how many courses they could choose (i.e., electives), this number was necessarily associated with a number of courses they had to take but could not choose themselves (i.e., the required courses). In many decision situations this is not the case—the number of selections is not always directly associated with a number of items the decision maker cannot choose for himself or herself. For instance, a person choosing a car is not also forced to accept several cars that someone else has chosen. Third, the exact effects of options and selections on PFC and satisfaction may vary depending on what the decision maker is choosing. Courses may not be the same as cars, or careers, or spouses, for instance.

Of course, these issues can only be addressed through further research. Still, while acknowledging the limitations, it is possible to derive some general principles from the present study that might be useful in real-world decision making. The first is that there is a difference between how one feels about a decision situation itself and how one feels about the outcome of a decision. Satisfaction with one does not necessarily imply satisfaction with the other, and we should not be fooled into thinking that having many

choices will make us happier. Consider the television enthusiast with 200 channels who laments that there is nothing good to watch, or the university graduate who is assured there are lots of jobs out there but they all pay minimum wage.

Another principle that may be gleaned from this study is that increasing our selections can be more effective at satisfying our needs than increasing our options by the same number. Rather than looking for the ideal career that has it all, therefore, we might do better to choose a vocation that satisfies some of our needs and an avocation that satisfies others. Similarly, rather than scouring the city for the perfect \$600 suit to cover all occasions, we might consider buying two \$300 suits instead, or three \$200 ones, each of which is perfect for a particular type of occasion.

Finally, it is useful to be aware that the law of diminishing returns applies to options and selections as well as values. To have an unlimited number of options may sound like an ideal choice situation, but our time, resources and attention are not unlimited. There must always be a compromise, therefore, between having a sufficient number of options but not having so many that it interferes with our ability to evaluate properly the ones we have. Knowing this, in our everyday decision making we might try to strike a balance so that we neither feel frustrated by having too few options nor overwhelmed by having more than we can reasonably handle.

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Appendix A

Experiment 2

Decision Making Questionnaire

Welcome to the experiment!

On this questionnaire, you will see 16 different types of undergraduate programs that universities might offer, each with a different number of required courses vs. electives, and each with a different number of course options from which to choose your electives.

As you look at each program, I would like you to imagine that you are a psychology student just starting out in this program. Please fill in each rating scale with a number from 0-100 (no decimals, please).

Thank you for your participation!

The Program: You must take 10 courses to complete the major. Of these, 6 are required and 4 are electives. You have 40 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 2 are required and 8 are electives. You have 10 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 2 are required and 8 are electives. You have 20 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 9 are required and 1 is an elective. You have 30 course options from which to choose your elective.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 2 are required and 8 are electives. You have 30 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 8 are required and 2 are electives. You have 20 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 8 are required and 2 are electives. You have 40 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 6 are required and 4 are electives. You have 20 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 9 are required and 1 is an elective. You have 40 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 8 are required and 2 are electives. You have 10 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 9 are required and 1 is an elective. You have 20 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 8 are required and 2 are electives. You have 30 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 2 are required and 8 are electives. You have 40 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 6 are required and 4 are electives. You have 10 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 9 are required and 1 is an elective. You have 10 course options from which to choose your elective.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

The Program: You must take 10 courses to complete the major. Of these, 6 are required and 4 are electives. You have 30 course options from which to choose your electives.

1. On a scale of 0-100, how much freedom of choice do you feel you have with this academic program in general? (0 = no freedom of choice, 100 = complete freedom of choice)

Rating: _____

2. How satisfied are you with this program in general? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

3. How satisfied are you with the number of electives in this program? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

4. How satisfied are you with the number of courses you have from which to choose your electives? (0 = not at all satisfied, 100 = extremely satisfied)

Rating: _____

Appendix B
Background Questionnaire

Please answer the following questions. All information will be kept strictly confidential and will be used only for the purposes of this study.

1) Age: _____

2) Sex: M F

3) What is your major? _____

(If you have a double major, write down both majors. If you still have not declared a major, indicate this on the line above.)

4) What year of your program are you in? _____

5) Do you know how many required courses and electives your program has?

Yes No

If yes, please list them below.

Required courses:	Full-year _____	Half-year _____
Electives:	Full-year _____	Half-year _____

6) Have you ever sought help in choosing courses from a professor, academic counselor or advisor?

Yes No

Appendix C-1

Experiment 1: Informed Consent Form

The purpose of an informed consent form is to insure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

Research Title: Freedom of choice and satisfaction in academic decision making.

Research Personnel. The following people are involved in this research project and may be contacted at any time. Carla Krachun (Principal Investigator, 520-2600, ext. 8204), Dr. Warren Thorngate (Faculty Sponsor, 520-2600, ext. 2706). Should you have any ethical concerns about this study please contact Dr. Mary Gick (Chair, Dept. of Psychology Ethics Committee, 520-2600, ext. 2664) or Dr. Kim Matheson (Chair, Dept. of Psychology, 520-2600, ext. 2648).

Purpose. The purpose of this study is to examine how much freedom of choice students feel that they have in different types of academic programs, and how satisfied they are with these programs. In particular, we want to investigate what contributes more to perceived freedom of choice and satisfaction, the number of electives in a program or the number of courses the student has from which to choose those electives.

Task Requirements. You will first fill out a short background questionnaire asking your age, sex, and some basic questions about your current academic program. You will then be given a questionnaire listing different types of academic programs, with varying numbers of electives and varying numbers of courses from which to choose those electives. You will be asked to rate your perceived freedom of choice and your satisfaction with each of these programs.

Duration and Locale. The experimental session will last approximately 30 minutes. Testing will take place at Carleton University.

Potential Risk/Discomfort. This experiment involves no potential physical or psychological risks.

Anonymity/Confidentiality. All responses given in this experiment are confidential. The data will be coded so that your name is not associated with the data. The coded data will be made available only to the researchers involved in this project.

Right to Withdraw. You have the right to withdraw from the experiment at any time without academic penalty.

Signatures

I have read the above form and understand the conditions of my participation in this study. My signature indicates that I agree to participate in this experiment.

Participant's Name

Participant's Signature

Date

Researcher's Name

Researcher's Signature

Appendix C-2

Experiment 2: Informed Consent Form

The purpose of an informed consent form is to insure that you understand the purpose of the study and the nature of your involvement. The informed consent must provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study.

Research Title: Freedom of choice and satisfaction in academic decision making.

Research Personnel. The following people are involved in this research project and may be contacted at any time. Carla Krachun (Principal Investigator, 520-2600, ext. 8204), Dr. Warren Thorngate (Faculty Sponsor, 520-2600, ext. 2706). Should you have any ethical concerns about this study please contact Dr. Mary Gick (Chair, Dept. of Psychology Ethics Committee, 520-2600, ext. 2664) or Dr. Kim Matheson (Chair, Dept. of Psychology, 520-2600, ext. 2648).

Purpose. The purpose of this study is to examine how much freedom of choice students feel that they have in different types of academic programs, and how satisfied they are with these programs. In particular, we want to investigate what contributes more to perceived freedom of choice and satisfaction, the number of electives in a program or the number of courses the student has from which to choose those electives.

Task Requirements. You will first fill out a short background questionnaire asking your age, sex, and some basic questions about your current academic program. You will then be shown on a computer screen four different academic programs, each with a different number of electives and a different number of courses to choose among. You will also be given course titles and descriptions of the courses. You will be asked to choose the courses you would like to take, and then to rate your freedom of choice and satisfaction with the program. You will also be asked to rate your satisfaction with each of the courses you have chosen.

Duration and Locale. The experimental session will last approximately 45 minutes. Testing will take place at Carleton University, in Room A428 of the Loeb Building.

Potential Risk/Discomfort. This experiment involves no potential physical or psychological risks.

Anonymity/Confidentiality. All responses given in this experiment are confidential. The data will be coded so that your name is not associated with the data. The coded data will be made available only to the researchers involved in this project.

Right to Withdraw. You have the right to withdraw from the experiment at any time without academic penalty.

Signatures

I have read the above form and understand the conditions of my participation in this study. My signature indicates that I agree to participate in this experiment.

Participant's Name

Participant's Signature

Date

Researcher Name

Researcher Signature

Appendix D-1

Experiment 1: Debriefing Form

Thank you very much for participating in this study. Your time and effort is greatly appreciated. This study was about perceived freedom of choice and satisfaction in decision making. Many times a day, we all experience having to make a decision. Whether or not we feel truly free to choose in these situations can affect what kind of choices we make. It can also affect how we feel about those choices. This is why it is important to identify the factors that affect how much freedom of choice we feel we have, and how satisfied we are with our decisions. This study examines two possible factors: the number of options available to the decision maker, and the number of items a decision maker can select. We wanted to determine which of these contributes more to perceived freedom of choice and satisfaction. The responses you gave on the task you performed will help us to answer these questions.

A common decision situation for students is choosing among courses. We knew that all of the participants in our study would be students, so we decided to use a task they could identify with. This study actually consists of two experiments; you took part in the first one. The two experiments were designed to answer slightly different questions. In the first experiment, we wanted to see how number of electives and courses affected perceived freedom of choice and satisfaction when participants had only abstract, numerical information about the programs. In the second experiment, we wanted to determine the relationships among these variables when there was also information available about the courses, and when participants got to actually make a decision. The background questionnaire you filled out at the beginning of the experiment will help us to determine whether perceived freedom of choice or satisfaction have any relation to age, sex, major subject, year of study, type of program you are currently in, and whether or not you have sought assistance in the past with choosing courses.

If you have any concerns or comments about this research, please feel free to contact Carla Krachun (Principal Investigator – 520-2600, ext. 8204) or Dr. Warren Thorngate (Faculty Sponsor – 520-2600, ext. 2706). If you have any ethical concerns about this research, please contact Dr. Mary Gick (Chair, Department of Psychology Ethics Committee, 520-2600, ext. 2664) or Dr. Kim Matheson (Chair, Department of Psychology, 520-2600, ext. 2648).

If participation in this study has inspired you to seek assistance in making academic decisions, some Carleton University contact numbers are included below.

Arts and Social Sciences, Advising:	520-7462
Career Services:	520-2611
Department of Psychology:	520-2644
Health and Counseling Services:	520-6674

Appendix D-2

Experiment 2: Debriefing Form

Thank you very much for participating in this study. Your time and effort is greatly appreciated. This study was about perceived freedom of choice and satisfaction in decision making. Many times a day, we all experience having to make a decision. Whether or not we feel truly free to choose in these situations can affect what kind of choices we make. It can also affect how we feel about those choices. This is why it is important to identify the factors that affect how much freedom of choice we feel we have, and how satisfied we are with our decisions. This study examines two possible factors: the number of options available to the decision maker, and the number of items a decision maker can select. We wanted to determine which of these contributes more to perceived freedom of choice and satisfaction. The responses you gave on the task you performed will help us to answer these questions.

A common decision situation for students is choosing among courses. We knew that all of the participants in our study would be students, so we decided to use a task they could identify with. This study actually consists of two experiments; you took part in the second one. The two experiments were designed to answer slightly different questions. In the first experiment, we wanted to see how number of electives and courses affected perceived freedom of choice and satisfaction when participants had only abstract, numerical information about the programs. In the second experiment, we wanted to determine the relationships among these variables when there was also information available about the courses, and when participants got to actually make a decision. The background questionnaire you filled out at the beginning of the experiment will help us to determine whether perceived freedom of choice or satisfaction have any relation to age, sex, major subject, year of study, type of program you are currently in, and whether or not you have sought assistance in the past with choosing courses.

If you have any concerns or comments about this research, please feel free to contact Carla Krachun (Principal Investigator – 520-2600, ext. 8204) or Dr. Warren Thorngate (Faculty Sponsor – 520-2600, ext. 2706). If you have any ethical concerns about this research, please contact Dr. Mary Gick (Chair, Department of Psychology Ethics Committee, 520-2600, ext. 2664) or Dr. Kim Matheson (Chair, Department of Psychology, 520-2600, ext. 2648).

If participation in this study has inspired you to seek assistance in making academic decisions, some Carleton University contact numbers are included below.

Arts and Social Sciences, Advising:	520-7462
Career Services:	520-2611
Department of Psychology:	520-2644
Health and Counseling Services:	520-6674

Appendix E

Course descriptions

Abnormal Behavior in Children and Adolescents

This course will provide information important to the understanding of psychopathologies that occur during childhood and adolescence. Various perspectives (e.g., genetic/biological, social, etc.) of abnormal behavior will be discussed. A major emphasis will be placed on current research in understanding psychopathology that occurs during childhood and adolescence.

Abnormal Psychology

The study of theory and research on abnormal human behavior. The major forms of psychological disturbance are discussed. An introduction to the prevention and treatment of psychological disturbances is given.

Adolescent Development

The physical, cognitive and social development of adolescents is studied in the context of family and peer relationships. Possible topics addressed include pubertal timing, gender roles, sexuality, vocational development and participation in risk-taking behaviors (e.g., substance abuse, early parenthood).

Advanced Experimental Design

The design and evaluation of psychological experiments are stressed, including detailed treatment of various analysis of variance models. In addition, the philosophy of statistics is examined in some detail.

Advanced Perception

Covers the origin and current status of several major problem areas within the study of perception. Provides the historical background and knowledge of recent theoretical and experimental contributions required to understand current conceptual schemes and disputes.

Advanced Social Psychology

Advanced seminars in social psychology. Offerings will focus on the interaction of the person and the environment. Specific offerings may include the psychology of attitudes, social comparison, health psychology and the psychology of the self.

Animal Behavior

An examination of the natural and, to a lesser extent, the laboratory behavior of several intensively studied groups of animals. Foraging and communication, predation and defense, sex and aggression, homing and migration are studied as they occur in such organisms as bees and ants, moths, bats, various birds, and chimpanzees.

Applied Social Psychology

The application of social psychological research and theory to the solution of social problems.

Artificial Intelligence and Human Cognition

Introduction to artificial intelligence (AI), focusing on computational models as a methodology for studying cognition. Topics include knowledge representation, learning, language processing, planning, and problem solving. The relation of AI research to psychological theories and results will be examined. Homework exercises will provide experience with AI knowledge representations and computer simulations.

Attention

Examines the processes of selective attention: how attention is located spatially; the role of attention in the perception of objects; automaticity; and the physiological mechanisms that mediate attentional processes.

Attitudes and Social Cognition

An examination of the concepts and principles involved in the interaction between the individual and others. Emphasis will be on the theoretical and empirical concerns of attitude formation and change, social perception, and social cognition.

Behavior and Drugs

Critical examination of the interaction between behavior and drugs, i.e. how drugs affect the body and behavior, development of tolerance to, and dependence on drugs, and therapeutic applications of all drug groups. Discussions focus on drug effects over the entire life span.

Behavior Modification

Current behavior change procedures for children and adults. Practical considerations involved in the selection, implementation, maintenance, and evaluation of behavior modification programs.

Child Development

Application of developmental psychological findings to early childhood education and care; influence of early experience and heredity, learning and perception, on the cognitive and social development of the young child. Considers such specific topics as discipline techniques, the stimulation of intellectual functioning, and sex role development.

Community Psychology

Community Psychology as conceptualized in the past 20 years. Emphasis on the interplay between community psychology, deinstitutionalization and the community mental health movements. The contemporary drive for consumer involvement in the development and provision of service will be a major perspective.

Comparative Psychology

This course examines the viability of comparative psychology today, the type of subjects used in comparative psychology research, its history and background, some applications and contemporary viewpoints, and its current status.

Computer Applications in Psychology

A lecture and laboratory course introducing students to the use of the computer as a valuable scientific tool for the design and control of experiments, response recording and data analysis, as well as the modeling of human and animal behavior.

Contemporary Theories and Systems in Psychology

This course will examine in some detail the basic principles of theory construction in psychology. Contemporary theories will be examined and their systematic characteristics evaluated. Developing trends in theory construction, particularly in interdisciplinary fields will be given a major emphasis.

Crisis Intervention

An examination of different short-term therapies in helping clients/patients in whom there is no evident psychopathology in spite of their observed dysfunctional behavior. The primary focus of this type of intervention is on the enhancement of individuals' existing strengths and on equipping them with more effective coping skills.

Critical Thinking in Psychology

The development of scientific thinking and discovery procedures in psychology. The design of experiments and quasi-experiments. Control of variables, statistical power and alternative sources of data. Critical analysis of typical examples of contemporary psychological research.

Culture and Psychopathology

Sociocultural factors involved in the manifestation and treatment of abnormal behavior.

Current Topics in Social Psychology

This course is devoted to a more detailed examination of some of the major topics within the field of social psychology. Students will examine experimental results and theories in such areas as interpersonal attraction, aggression, social cognition, attribution theory, social conformity, and race relations.

Dyadic Relations

This course covers friendship formation and dyadic relations - linking, liking, loving, and leaving from an empirically oriented psychological perspective.

Early Childhood Education

A survey of various approaches to early education in nursery school and day care including public schools, infant group care and compensatory education programs.

Factors that may determine the influence of early education on cognitive and social development will be considered.

Early Development

This class examines development in infancy and the preschool period. The main theme of the class is to show how perceptual, cognitive, emotional, social, and linguistic changes occurring during the first five years of life are integrated in the psychological life of the child to allow the development of social understanding.

Educational Psychology

Principles of psychology relevant to educational theory and practice. Subject matter is drawn from different reading sources and is considered in historical and contemporary context. The course is designed mainly for those entering education and allied fields.

Emotion

Emotion as a source of motivation and adaptation. Levels of analysis include experiential, behavioral and physiological. Simple (joy, surprise, interest, anger, fear) and complex (love, anxiety) emotions will be discussed. Universal characteristics and cultural variations will be explored.

Environmental Psychology

The relationships of natural and constructed environments to human behavior and experience. Perception of the environment, effects of noise, temperature, wind and air pollution on behavior and experience, personal space, territoriality, crowding, environmental design, attitudes toward the environment.

Ergonomics

This course in applied psychology explains how to take into account human abilities and requirements in regard to tasks, equipment, facilities, and environment with an emphasis on improving satisfaction, performance, efficiency, and safety. Included for study are examples of jobs, tools, information, and buildings. An individually designed project provides an opportunity for student to apply ergonomic principles.

Experimental Psychology

This course is designed to acquaint students with advanced issues in research methodology, and to provide them with first-hand experience in carrying out original research in experimental psychology. The course will emphasize the application of research skills and techniques acquired in prerequisite courses to the solution of conceptual issues of concern in advanced experimental psychology.

Field Research Methodology

This course deals with techniques for studying complex behavior in non-laboratory settings. Topics such as the neutrality or invisibility of the observers, participant observation, categorization, and recording problems may be studied. The relationship between laboratory findings and findings from the non-laboratory setting is considered.

Forensic Psychology

This course addresses issues on the interaction between psychology and law. Community mental health, court and prison milieus will be studied. The course will include a consideration of case studies and investigations focusing on offender populations.

Gender Differences

An investigation of how the sexes differ, and how they do not differ, in many aspects of psychosocial functioning. Emphasis will be placed on the different socialization of males and females.

Health Psychology

An aggregate of the scientific and professional contributions of the discipline of psychology towards promotion of a holistic approach for a) the maintenance of health, b) the prevention and treatment of illness including etiologic and diagnostic correlates of health and illness.

History and Systems of Modern Psychology

Examines the development of modern psychology from the founding of the first laboratories in the late 19th century to the present. The development and revisions of the major theoretical systems of psychology are examined from a comparative and critical perspective.

History of Psychological Thought

The roots of psychological thought in Western culture, and the relationship between theories of human nature and changing social institutions.

Hormones and Behavior

The course deals with the role of hormones in integrating the activity of various neural, endocrine, and sensory systems to bring about organized, purposeful behavior. Topics discussed include the reproductive, sexual, or environmentally adaptive systems, with treatment of material ranging from the molecular to the behavioral level.

Human Behavior Genetics

Deviant human behavior from contemporary genetic and sociobiological foundations. Some background in the biological sciences would be an asset.

Human Information Processing

An examination of theories, issues, and published research in the general area of human information processing, with an emphasis on visual information processing. Topics include: attention; visual persistence; pattern, letter, word, and object recognition; scene perception; human performance; visual memory.

Human Memory

An introduction to the study of human memory. Topics include verbal learning and interference theory, the short-term/long-term memory distinction, semantic memory, working memory, sensory memory, autobiographical memory, amnesia, and implicit memory. The emphasis will be on developing coherent theoretical accounts of the evidence.

Human Neuropsychology

This class explores not only normal but also abnormal brain function, as revealed by the consequences of trauma, disease, and surgical intervention. Aphasia, epilepsy, the role of brain chemicals in behavior, cerebral asymmetry, and localization of brain function are examples of the topics covered.

Human Sexuality

Provides a broad introduction to the psychology of human sexuality, including examination of such specific topics as sexual anatomy, sexual behavior throughout the life span, sexual response, sexual dysfunction and therapy, sexual variation, and pregnancy and childbirth. Emphasis on placing empirical findings within physiological, personal, interpersonal and social frameworks.

Humanistic Psychology

Humanistic psychology is referred to as the third force in reference to two other major forces in North American psychology, behaviorism and psychoanalysis. This perspective is used in a comparative study of some presuppositions and achievements of the three forces.

Independent Research in Psychology

Students carry out a research project and write a paper. Research may include historical, theoretical or experimental analyses of psychological problems.

Industrial Psychology

An examination of the theories and concepts of industrial psychology. Topics covered will include research and testing methods, measuring job and performance appraisal systems, personnel selection methods, personnel training and development, work motivation, work stress, designing work for people, and human engineering.

Intermediate Research Design and Analysis

Topics in this course include intermediate research methods (e.g., computer-aided research design and literature search, construct validity), intermediate data analysis methods (e.g., analysis of variance and partial/multiple correlation techniques for selected experimental and non-experimental designs), and current issues in social science methodology. The lab component provides opportunities to design, execute, analyze, and report the results of behavioral research, and emphasizes the use of computers in research design and data analysis (e.g., the use of such statistical packages as BMDP, SAS, and SPSS).

Interpersonal and Intergroup Processes

This course examines behavioral interaction between individuals and between groups. Topics covered include aggression, altruism, conflict resolution, language and bilingualism, and large-scale collective behavior.

Introduction to Clinical Psychology

This course offers a survey of major topics in clinical psychology, including assessment and intervention approaches; experimental psychopathology; ethical, professional and theoretical issues; and emerging trends.

Introduction to Guidance and Counseling

Surveys the concepts, theories and resources involved in the guidance and counseling area. Familiarizes the student with the nature of the guidance and counseling processes.

Language and the Brain

An introduction to the processes in the use of language by human beings. The main topics are: 1) the structure of the language; 2) the function of language; 3) the process of comprehension; 4) the process of production; 5) acquisition of language; and 6) language disorders and brain damages.

Learning Disabilities

A critical examination of the concept of learning disability and of current issues in the assessment and remediation of learning problems.

Learning Processes and Drug Effects

Explanations of many of the behavioral effects of drugs can be found in learning and conditioning theory. This course will provide a careful examination of such processes as drug state conditioning and discrimination, drug effects on operant behavior, drug self-administration and tolerance.

Learning

Types and mechanisms of learning, the variables and conditions which contribute to learning processes. Review of experimental findings and theoretical issues related to learning.

Longevity and Aging

An overview of the neuropsychological, physiological, clinical and personological aspects of the later phases of life. Normal and abnormal patterns of aging are examined. Topics include research from neuropsychology, neuroanatomy, personality, clinical psychology, gerontology and geriatrics.

Mathematical Psychology

Introduction to measurements and scaling, decision theories (theory of signal detectability, game theory, and individual choice theory). Application of systems theory, information theory, and mathematical learning theory.

Mathematical Theories of Behavior

The course surveys applications of mathematical techniques to problems of psychology in such areas as motivation, learning, decision-making, sensory psychophysics, and perception. Students enrolling in this course should have a mastery of elementary probability theory and should be confident of their ability to deal with elementary calculus, algebra, and logic.

Mind, Brain, and Computers

How computers contribute to the integrative study of the mind and brain. Topics include real and artificial neurons and neural networks, finite automata, feedback systems, pattern recognition by neural networks and the brain, motor programs, connectionism, supervised and unsupervised learning, synaptic matrices, Turing machines, self-reproducing automata, and genetic algorithms.

Motivation

Motivational systems including sleep, wakefulness, hunger, sex, aggression, persistence, cognitive and behavioral control, and self-esteem.

Multivariate Statistics

The design, analysis, and interpretation of research involving more than two variables using correlational techniques. Topics include partial coefficients, editing data, multiple regression/correlation analysis, and nominal and qualitative scale coding.

Neural Networks and Psychology

Several neural networks applied to perception, learning, and cognition. Neural architectures including adalines, perceptron, backpropagation, autoassociative nets, Boltzman machines, reinforcement nets, competitive learning, and adaptive resonance theory. Computer simulations of the different networks.

Neuropsychological Assessment

Study of the most frequently used tests in the assessment of brain damage. Discussion of the validity of these tests for the different diagnoses of functional and organic disorders of patients encountered in neuropsychiatric settings.

Nonexperimental Research Methods in Psychology

Examination of various non-experimental and qualitative approaches to creating psychological knowledge including questionnaire construction and use, observational techniques, and research interviewing.

Nonverbal and Emotional Communication

Perspectives in biological, developmental, social, motivational, and clinical psychology are dealt with. Topics covered include facial, gestural, corporal, paralinguistic, vocal, visual and spatial nonverbal communication. Comparison and links with linguistic communication and animal communication are considered.

Personnel Training and Development

Intensive examination of topics related to training and systematic organizational development. Emphasis is on application of psychological concepts and principles of learning in the contexts of needs assessment, curriculum development, transfer of training, and evaluation.

Physiological Psychology

A study of biological and biochemical bases of behavior. Neural and hormonal mechanisms underlying sensory processes and motor integration; sleep, dreaming, attention and consciousness; learning and thinking; emotion and motivation will be reviewed.

Psycholinguistics

This course provides an examination of the various models and approaches to language behavior, with particular emphasis on contemporary psycholinguistic theory and research. Topics include language acquisition, the physiological and cognitive processes mediating language behavior, semantic considerations, symbolic behavior, animal communication, and the cultural context of language.

Psychological Assessment Procedures

A survey of selected techniques for assessment of individual and group differences in aptitudes, abilities, achievement, attitudes, interests, and personality. Emphasis is placed on evaluating the effectiveness of various techniques, including performance tests, self-report questionnaires, inventories and projective approaches.

Psychological Measurement

This course examines the history and principles of psychological testing. It is primarily concerned with the logic and quantitative aspects of test construction (e.g., issues of reliability, validity, item analysis, scaling problems, etc.), but will also consider the foundations of some popular psychological tests (e.g., MMPI, Rorschach, WAIS, etc.).

Psychology and the Law

The relationship between psychology and the legal system. Theory, empirical findings, and court cases in mental health law, including the insanity defense, competency to stand trial, and civil commitment. Use of social science data in several legal domains, including expert testimony in rape and domestic assault trials, employment discrimination, and trademark infringement.

Psychology of Aesthetics

An introduction to the psychological analysis of response to art. Consideration is both theoretical and empirical. Illustrative materials are drawn from several arts, including painting, sculpture and literature. The contribution of aesthetic behavior to personality development is considered.

Psychology of Aging

This course will evaluate current research in the psychology of aging. The behavioral processes to be examined will include changes in perception, memory, problem solving and adjustment. Assessment and intervention strategies will also be discussed.

Psychology of Human Values

This course will explore the area of values from a psychological perspective. The development and modification of values and their impact on behavior will be investigated both theoretically and experientially. Areas explored may include topics such as values in education and in the family, techniques for values clarification, and the impact of values on self-concept, sexuality, emotion, etc.

Psychology of Leisure

This course explores the rapidly developing psychologically oriented theory and research on leisure and its meaning and importance for the individual. Topics that may be considered include motivation for leisure activities, planning for leisure and/or retirement, therapeutic value of leisure, new conceptions of work and leisure, leisure and self-development.

Psychology of Organizational Development

An examination of strategies designed to improve organizational effectiveness using behavioral science knowledge. Attention will be devoted to understanding factors that influence the success of organizational change initiatives and the process of change.

Psychology of Religion

A study of the psychology of religious experience and its implications for man's search for identity, psychological and emotional needs, guilt, fear, delinquency, psychopathology and psychotherapy.

Psychology of the Healing Process

This course will examine psychological dimensions in the experience of healing. From research on the effectiveness of the "Placebo effect," to contemporary studies detailing relatively new mind-body interactions, theory and research interact with some surprising results. By necessity, this study will be multidisciplinary, taking into account medical, psychological, and spiritual traditions in the healing arts.

Psychology of Women

This course will focus on women's development throughout the socialization process and its consequences at the individual, interpersonal relationship, and societal level, as well as recent alternative views of the psychology of women.

Psychometric Measurement

Creation and evaluation of psychological tests and other measures. Scaling and measurement. Principles of test construction, item analysis. Introduction to factor analysis and linear prediction. Techniques for the assessment of reliability and validity. Controversies and current developments in psychological testing.

Psychopharmacology

Emphasis will be placed on the relationships between psychoactive drugs, their mechanisms of action in the nervous system, and human behavior. Following an analysis of the principles of pharmacology and pharmacokinetics, as well as the mechanisms of drug tolerance and dependence, the cognitive, emotional and behavioral aspects of specific classes of drugs will be examined. These will include sedatives, hypnotics, stimulants, narcotics, psychotomimetics, psychedelics and hallucinogens.

Psychosexual Organization

A detailed examination of concepts related to the formation of gender identity and psychosexual orientation. The 'Nature-Nurture' debate will be explored as well as gay and lesbian identity and consciousness throughout the life cycle.

Psychotherapy

The course will examine some basic principles of interpersonal processes designed to bring about modification of feelings, cognitions, attitudes and behavior of individuals suffering from psychological problems. Various modalities of treatment and different theoretical orientations will be reviewed and discussed.

Qualitative Methods

The nature and role of qualitative research methodology in psychology in relation to the variety of research functions psychologists perform in the community. Various formal theories with particular emphasis on program evaluation and action research strategies in the community.

Research in Conditioning and Learning

The course will cover research and theory in contemporary areas of classical and instrumental conditioning. Specific topics covered will include autoshaping, inhibition, cognitive representations in conditioning, behavioral economics, conditioned drug effects, taste aversion conditioning, and learned helplessness.

Research Methods and Data Analysis

This course provides a basic introduction to the scientific method used in psychological research and the statistical treatment of data. The student will learn how to quantify

psychological observations and interpret the validity of research claims. Basic skills in probability theory and statistical methods will also be covered.

Research Methods in Animal Behavior

The class consists of projects illustrating the use of observational and experimental techniques in animal behavior research. Facilities to work with fish, birds and small rodents are available.

Research Methods in Psychology

An introduction to the procedures used in psychological research, and to the logic underlying them. Topics include the strengths and weaknesses of different approaches to research, the formulation of testable questions, the control of extraneous influences, the measurement of effects, and the drawing of valid conclusions from empirical evidence.

Reward, Punishment, and Behavior

The experimental and theoretical analysis of learning, memory, and behavioral modification, primarily in animals. Topics will include: nonassociative learning; classical and operant conditioning; animal models of depression, addiction, and cognition; biological mechanisms of learning.

Scaling

The theoretical basis and application of scaling methods in psychophysics and social psychology are studied. Quantitative scales for the measurement of attitudes and sensations are derived and constructed. Other topics that may be covered include subjective estimate methods, the law of comparative judgement, unfolding techniques, and signal-detection theory.

Sensation and Perception

A survey of the psychological research designed to study the mental events involved in information extraction. Topics covered could include vision, audition, size and shape consistency, form and pattern perception, attention and illusions, and perceptual development.

Sexual Behavior

A psychological analysis of sexual behavior. The course will examine the physiological, behavioral, social and personality bases of the male and female sexual response, heterosexuality and homosexuality and other sexual behavior. Other topics may include the social precursors of human sexual behavior, sex therapy, pregnancy and childbirth, and nonhuman sexual behavior.

Sleep and Wakefulness

The functions, mechanisms, rhythms, physiology and psychology of sleep will be contrasted with counterparts during wakefulness. Current issues in sleep and dream research will be raised.

Social Cognition

This course will explore how individuals make sense of themselves and the people around them. We will study classic and contemporary social cognition research to examine how people process information about their social world.

Social Development Across the Life Span

A review of the theory and research on human social development across the life span. The course will cover how social thinking and social behavior changes across the course of life, from birth through to old age.

Social Issues

This course will provide an in-depth look at a major social issue from the psychological perspective. Specific topics will vary from year to year.

Sport and Exercise Psychology

Systematic review of what scientific psychology has contributed to the understanding of sport and exercise. Issues include: factors determining participation and performance, costs and benefits of physical activity, personality and sport, team vs. individual sports, competitive judging in sport, society and sport.

Stress and Coping

Psychological theory and empirical work on stress and coping, with an emphasis on post-traumatic stress.

Test Construction

A review of methods for developing psychological tests, questionnaires, and surveys. Topics will include reliability and validity, norming and standardization, attitude measurement, and observational methods. Opportunities for developing measures of human abilities and personality will be provided.

Theories of Personality

This course examines contemporary theories of personality. Attention will be paid to theoretical ideas about growth and development, personality structure, and psychopathology.

Theories of Psychotherapy

An examination of the various forms of psychotherapy, including the psychoanalytic, behavioristic, humanistic, and cognitive approaches. The focus will be upon the theoretical base, format, and empirical support for each approach. The impact of different treatment settings will also be considered.

Thinking and Decoding

Cognitive processes underlying human reasoning, problem solving, judgment, and decision making will be examined. Much of the discussion focuses on current models of these processes, and on the comparison between how rational people (or machines)

should ideally behave and how they actually behave in everyday problem solving and decision making.

Appendix F

Screen printouts from computer program

Hello, and welcome to the experiment!

When you begin the experiment, you will see a list of course titles on the screen. The computer will indicate how many courses you need to choose.

As you click on each course, a description of that course will appear. To choose a course, select the blue "choose it" button. The button will then change to a red "unchoose it" button. If you change your mind and would like to unchoose a course, simply click on that button.

When you are finished choosing the courses you would like to take, select the yellow "finished my choice(s)" button. After you choose your courses, please answer the questions that appear on the screen.

Take as much time as you need to examine the courses and make your decisions. You will see a total of four different programs, each at a

Attention
 Learning Processes and Drug Effects
 Advanced Perception
 Industrial Psychology
 Emotion
 History of Psychological Thought
 Early Childhood Education
 Abnormal Behavior in Children and Adolescents
 Environmental Psychology
 Educational Psychology
 Scaling
 Human Sexuality
 Psychology of Aesthetics
Psychology and the Law
 Sexual Behavior
 Community Psychology
 Learning
 Psycholinguistics
 Field Research Methodology
 Neural Networks and Psychology
 Psychology of Organizational Development
 Advanced Social Psychology
 Advanced Experimental Design
 Early Development
 Applied Social Psychology
 Longevity and Aging
 Psychology of Leisure
 Test Construction
 Research in Conditioning and Learning
 Psychology of Human Values
 Experimental Psychology
 Introduction to Clinical Psychology
 Computer Applications in Psychology
 Psychological Assessment Procedures
 Sleep and Wakefulness
 Multivariate Statistics
 Contemporary Theories and Systems in Psychology
 Culture and Psychopathology
 Psychology of Aging
 Psychology of the Healing Process

Psychology and the Law :

The relationship between psychology and the legal system. Theory, empirical findings, and court cases in mental health law, including the insanity defense, competency to stand trial, and civil commitment. Use of social science data in several legal domains, including expert testimony in rape and domestic assault trials, employment discrimination, and trademark infringement.

Finished my choice(s)

Psychology of Leisure
Sleep and Wakefulness
Advanced Experimental Design
Psychosexual Organization
Theories of Psychotherapy

Social Cognition

Animal Behavior
Multivariate Statistics
Current Topics in Social Psychology
Nonexperimental Research Methods in Psychology
Theories of Personality
Research Methods in Psychology
Field Research Methodology
Intermediate Research Design and Analysis
Human Information Processing
Experimental Psychology
Learning
History of Psychological Thought
Psychology of Human Values
Humanistic Psychology
Thinking and Deciding
Psycholinguistics
Environmental Psychology
Psychology of Aging
Dyadic Relations
Abnormal Behavior in Children and Adolescents
Psychometric Measurement
Mind, Brain, and Computers
Community Psychology
Personnel Training and Development
Introduction to Clinical Psychology
Child Development
Abnormal Psychology
Contemporary Theories and Systems in Psychology
Human Behavior Genetics
Independent Research in Psychology
Nonverbal and Emotional Communication
Culture and Psychopathology
Motivation
Psychopharmacology

Social Cognition :

This course will explore how individuals make sense of themselves and the people around them. We will study classic and contemporary social cognition research to examine how people process information about their social world.

Finished my choice(s)

Psychology of Leisure
 Sleep and Wakefulness
 Advanced Experimental Design
 Psychosexual Organization
 Theories of Psychotherapy
 Social Cognition
 Animal Behavior
 Multivariate Statistics
 Current Topics in Social Psychology
 Nonexperimental Research Methods in Psychology
 Theories of Personality
 Research Methods in Psychology
 Field Research Methodology
 Intermediate Research Design and Analysis
 Human Information Processing
Experimental Psychology
 Learning
 History of Psychological Thought
 Psychology of Human Values
 Humanistic Psychology
 Thinking and Deciding
 Psycholinguistics
 Environmental Psychology
 Psychology of Aging
 Dyadic Relations
 Abnormal Behavior in Children and Adolescents
 Psychometric Measurement
 Mind, Brain, and Computers
 Community Psychology
 Personnel Training and Development
 Introduction to Clinical Psychology
 Child Development
 Abnormal Psychology
 Contemporary Theories and Systems in Psychology
 Human Behavior Genetics
 Independent Research in Psychology
 Nonverbal and Emotional Communication
 Culture and Psychopathology
 Motivation
 Psychopharmacology

Here are the instructions for completing the questionnaire:

1. Enter your ratings in the boxes below.
2. Press the TAB key after entering each number to go to the next box, or move the arrow pointer to the next box and click.
3. When you are finished, click on the green "next trial" box.

On a scale of 0 to 100...

How much freedom of choice do you feel you have with this academic program in general? _____
 (0=no freedom of choice, 100=complete freedom of choice)

How satisfied are you with this program in general? (0=not at all satisfied, 100=extremely satisfied) _____

How satisfied are you with the number of electives in this program? (0=not at all satisfied, 100=extremely satisfied) _____

How satisfied are you with the number of course options you have from which to choose your electives? (0=not at all satisfied, 100=extremely satisfied) _____

How satisfied are you with the courses you have chosen? (0=not at all satisfied, 100=extremely satisfied) _____

How difficult was it to make your choices? (0=not at all difficult, 100=extremely difficult) _____