In Defense of the Rationality Assumption

Peter V. Bias, Florida Southern College

Patrick L. Smith, Florida Southern College

Hanna Jansson, Florida Southern College

Abstract

It has become commonplace for economists to assert that human beings are not fully economically rational. Many psychologists and behavioral economists now maintain that economic agents do not reason very well, that these agents often do not know what is good for them and that they behave in odd, non-reasoning, inconsistent ways. Paradoxes and inconsistencies supposedly surface in economic behavior, making agents appear to be unpredictable, but interesting and wonderfully "complex." In this paper, however, it is argued that economic agents are, in fact, quite rational, are predictable under strict ceteris paribus *assumptions, and are much simpler and uninteresting than psychologists and behavioral economists might have us believe. In support of the contention of rationality, Tversky's classic behavioral experiment of irrelevant alternatives is performed again but results are obtained in disagreement with Tversky.*

Introduction

Economists often invoke the assumption of rationality, which asserts that individuals who are knowledgeable of possible outcomes are able to make logical and consistent choices that maximize utility. Critics of the rationality assumption suggest that economic agents sometimes exhibit irrational behavior and/or an unawareness of potential effects. Many criticisms and alleged paradoxes that have been levied against rational economic man are presented below. However, counterarguments to these criticisms are presented in the form of 'rebuttals' and a re-investigation of Tversky's classic behavioral experiment of irrelevant alternatives is performed. These are submitted in support of the continued use of the rationality assumption in economics.

Rational Choice Theory

Rational choices are thought to be based on reason and are made to maximize utility. Logical inferences relate premises to conclusions. For behavior to be rational, the premises need to be justified, and the proper conclusions need to be drawn. Rational agents maximize utility intertemporally. They plan for the future while making choices in the present. For a dynamic, intertemporal-thinking economic agent utility comes from both present and future satisfaction, so it can be rational to sacrifice something today in order to get something another day. Rational individuals are generally assumed to be well informed and knowledgeable of all possible alternatives

and outcomes, but there are often exceptions to this assumption. A rational economic agent evaluates and ranks all alternatives before a choice is made and makes preference decisions such that they maximize utility. Preference comparability is necessary so alternatives can be determined to be either indifferent to, preferred to, or less than preferred to other choices. If indifferent, a rational agent will choose the one which has the highest probability of positive outcome. A rational agent's preferences are assumed to be time-consistent, independent of framing, and affected by own-valued payoffs, *ceteris paribus*.

These are the behaviors that are expected of a rational, utility-maximizing economic agent, but there have been criticisms of this model of consumers. Rationality theory has been heavily criticized by common principles of behavioral psychology (see Herrnstein, 1961; 1990). Herrnstein (1990) suggests that economic and behavioral theory diverge from their methods of explaining human behavior. While economists take a deductive approach in classifying all rational behavior under a mathematically-derived equilibrium, behaviorists tend to focus on explaining how behaviors are controlled by general environmental processes. This theory takes a more inductive approach, and it is supported by a collection of empirically-driven observations. Classically referred as matching law, there is a robust amount of literature that suggests one modifies behaviors on concurrent schedules of subsequent reinforcement, and these behaviors change in order to maximize the level of reinforcement gained (for a review, see de Villiers, 1977; Herrnstein, 1961). More recent work has been applied to naturalistic settings, ranging from choices made by professional athletes (Reed, Critchfield, & Martens, 2006) to consumer preferences of marketed products (Foxall & Schrezenmaier, 2003). Although behavioral theory does have empirical support, it does not account for behaviors that have not been previously reinforced, and when faced with new decisions, such a theory may not predict decisions that may be guided by anticipated consequences. In the real world, many decisions require more proactive reasoning when making personal decisions, which would require more cognitive, or rational, processes. Regardless of each theory's shortcomings, they do share the common assumption that humans are motivated to maximize behaviors in their own best interests and are able to analyze the risks and rewards of their present and future behaviors.

Due to the deductive nature of rationality theory, behaviors that have not yet been reinforced can be more readily characterized, but there have been numerous criticisms that have arisen to challenge its generalizability to decision-making within economic parameters. Many of these criticisms are listed below.

Criticisms of Rationality Theory and their Rebuttals

In defense of the rationality assumption described above, many of the common criticisms and paradoxes that have been lodged against economics rationality assumption are reviewed below and an attempt is made to show why the rationality assumption has, in many instances, actuality not been violated at all. The direct criticisms of economic agents' rationality assumption are as follows:

Economic agents:

1) *Are not time-consistent*
2) *Are overconfident*
3) *Seek diversity over utility*

4) *Are subject to social pressure and emotions*
5) *Fail to ignore irrelevant or sunk costs*
6) *Tend to behave based on recent examples or frequently heard examples*
7) *Tend to measure marginality in percentages instead of absolutes*
8) *Are influenced by framing*
9) *Satisfize rather than maximize*

Each of the criticisms is explained and rebutted below.

Economic agents are not time-consistent

According to critics, economic agents are not time-consistent and are subject to self-control problems. For instance, among the many 'irrational' behaviors they find, Tversky and Kahneman (1981) contend that preferences are not always transitive. Some individuals tend to prefer payoffs today over payoffs in the future (e.g. they might show indifference between $15 today and $20 in one month, even though the difference exhibits an annual discount rate of 345%). This would suggest the rational choice model fails to consider the self-control problems, which will sometimes lead to wrong predictions in behavior. However, it can be important in guiding people toward decisions corresponding to their objectives and preferences (Frank, 2000).

Rebuttal – economic agents are not time-consistent: By taking self-control problems and overconfidence into consideration, rationality theory has already taken a step closer to optimizing the predictability of behavior. For instance, Laibson (1997) as well as O'Donoghue and Rabin (1999) formalized preferences based on numerous earlier studies (e.g., Akerlof, 1991; Phelps & Pollak, 1968; Strotz; 1956) to account for self-control problems and overconfidence. They posited the per period utility at time *t*, U_t, as follows:

$$U_t = u_t + \beta\delta u_{t+1} + \beta\delta^2 u_{t+2} + \beta\delta^3 u_{t+3} + \ldots$$

The standard model uses δ as the discount factor while this modified version uses $\beta \leq 1$, capturing the self-control problems. The discounting between the present and the future is higher than between any future time periods for $\beta < 1$. When $\beta = 1$, the discounting is the same as for the standard model. A partially naive or overconfident individual expects to have the following utility function in the future period t + s where $\hat{\beta} \geq \beta$:

$$\hat{U}_{t+s} = u_{t+s} + \hat{\beta}\delta u_{t+s+1} + \hat{\beta}\delta^2 u_{t+s+2} + \hat{\beta}\delta^3 u_{t+s+3} + \ldots$$

An individual who is sophisticated about the self-control problem will have $\hat{\beta} = \beta$, while a completely naive individual will have $\hat{\beta} = 1$. This model accounts for primary self-control problems combined with a form of overconfidence and naive expectations about future self-control and is still within the standard rationality model.

Economic agents are overconfident

Critics argue that when evaluating future outcomes, people are overconfident in the evaluation of their own abilities. For instance, with the best laid plans on exercising and smoking cessation, healthy-conscious individuals are hopeful, but as the future

becomes near, they choose to binge eat and light another cigarette. This phenomenon has been characterized in all forms of society, ranging from social settings (e.g., Vallone et al., 1990) to professional settings (e.g., Chu, Im, & Jang, 2012). Critics suggest that overconfidence is apparent when evaluating ability. For instance, Svenson (1981) found that 93% of subjects rated their driving skills as above the median. Overconfidence is more common when the decision maker has an illusion of control (e.g. managers), and the phenomenon suggests that such an illusion can have a strong influence on incorrectly predicting one's own future behaviors.

Rebuttal – economic agents are overconfident: Overconfidence largely results from a lack of information. People who buy exercise equipment only to have it stored in the garage for the next eight years are not irrational, but instead are only dreaming of a healthier body. They suppose that with the equipment at hand and having spent the money, it will be motivation enough to get them to exercise. It might have worked except for one piece of information that was not anticipated – pain. People give up weight loss programs because commitment to these programs involves more work than was originally realized. Thus, a lack of information about full commitment may be a likely reason for various decisions that are assumed to be irrational. Kogan (2009) empirically demonstrated that one's level of personal overconfidence is a less important factor than what one observes as relevant information when estimating economic judgments. Moreover, Biais et al. (2002) reported that one's level of self-monitoring behavior (i.e., the attentiveness to the social responses of others) may be a more direct link to accurate decisions about one's ability. Together these data would suggest that true rational behavior is essentially driven by a need to pursue information rather than to ignore it.

Economic agents seek diversity

Another criticism that has been presented is the striving for diversity when making complex decisions, even though it might lower their total intertemporal utility. For instance, when workers had to choose their afternoon snack for the whole week in advance, most of them decided to go with a variety of foods rather than sticking to their favorite snack every day. This is not rational behavior since they would have received more satisfaction from eating their favorite snack each day (DellaVigna, 2009). In order to be consistent with rational choice theory, diversity should in this case be sacrificed for the choice of the favorite.

In the Daniel Ellsberg paradox (1961), investors who are ambiguously averse may prefer an investment with known distribution of returns to an investment with unknown distribution of returns, even if the average returns are the same for both investments and despite the benefits of diversification. Individuals make choices depending on what stands out among the available alternatives. Consider a ballot: the first politician on the list of candidates stands out and is more likely to be chosen, especially in primary elections where the candidates are usually less known. When there are too many choices, individuals find the decision stressful and may try to avoid it. This goes against the standard model that states that more choices can only lead to increased purchases.

Rebuttal – economic agents seek diversity: Individuals make choices according to what they think will provide them with the highest utility (see de Villars, 1977; Herrnstein, 1961). When workers choose the snacks for a week in advance, they go

with what they think will provide them with the highest utility, knowing that eating the same thing everyday most likely will get tiresome as the week passes. Even if the favorite snack might yield higher utility on one specific occasion, that occasion's utility (in the long run) is not necessarily predictive for that one food at later times. The consumer makes the choice according to what is expected to result in the higher utility. A wide selection might be chosen simply because variety is preferred over tiring out the favorite, or in this case, possibly due to health reasons. Sometimes, individuals are not fully informed about their choices and the potential ramifications, and it does not turn out exactly the way they had planned. Humans like certainty and prefer to avoid an unnecessary risk, which explains why the known distribution of returns on investment is preferred to an unknown distribution of returns. It simply provides higher utility at the moment. Taking a risk can be seen as bringing negative utility due to anxiety.

Economic agents are subject to social pressure and emotions

Critics claim that social pressure and emotions also affect economic agent decisions. For example, referees in soccer games, on average, give twice as much extra time when the extra time is to the advantage the home team than when it is bound to hurt it. The effects are larger when the stakes are higher since the social pressure increases (Garicano, Palacios-Huerta, & Prendergast, 2005). Mas and Moretti (2009) also found that workers who feel as if they are being observed by a high-productivity coworker tend to increase their productivity. Thus, in order to appease a larger group to which one belongs, one may compromise his or her own personal decision-making process.

Psychological studies have also shown that even minor environmental events have a substantial impact on behaviors that are emotionally-driven. For example, on sunnier days, people tip more at restaurants (Rind, 1996) and express higher levels of overall happiness (Schwarz & Clore, 1983). Mood fluctuations induced by the weather have also been shown to affect stock returns. For instance, days with higher cloud coverage in New York are associated with lower aggregate U.S. stock returns (Saunders, 1993). It has also been reported that international soccer results also have an impact on the daily stock returns for the losing country (Edmans, Garcia, & Norli, 2007). In this study, losses in soccer have been correlated with lower daily returns. These experiments suggest that behaviors may be related to behaviors that compromise one's rational control of his or her own behaviors.

Rebuttal - economic agents are subject to social pressure and emotions: This is, in fact rational because the behavior is performed as self-protection. Larrick (1993) has characterized numerous sources of human motivation that stem from both physical and psychological sources. One example of such an influence can be seen in close athletic competitions where the consequences of a referee's decisions may have heated outcomes. Referees that govern such competitions have previously been victims to threats and murders, so the instinct to protect their safety is natural and definitely rational. A preoccupation for self-protection may subsequently influence the decisions that are made throughout the competition. From the latter, needs for self-protection and affiliation are considered common and can be considered a rational source of motivation.

Although various behaviors like self-control, helping others in need, and dietary selection are likely to be respectively influenced by social and emotional states such

as temptation, empathy, and hunger (e.g. Eisenberg & Fabes, 1990; Laeng, Berridge, & Butter, 1993; Turner & Oakes, 2011;), all of these are factors are also affected by self-serving utility (e.g., Turner & Oaks, 2011; Mattes, 1994) . Utility theory can never explain why an economic agent derives utility from a choice, as it can only predict how the agent will behave rationally with respect to a choice. Thus, any individual agent behavior is assumed to be ultimately determined by the perceived benefits/concerns of the individual rather than direct concern for ambient social and emotional circumstances.

Daniel Kahneman, Nobel Prize winner in economics, and the late, renowned psychologist Amos Tversky, were able to find several other apparent faults with economist's assumption of rationality. Amos Tversky, in a number of studies done in collaboration with various other scholars, has asserted that individual choice behavior often does not conform to the fundamental premises of rational choice theory. Many of these results are described in studies conducted by Tversky and Kahneman (1981) and they have influenced psychologist and economists ever since. They find that the basic assumptions of expected utility maximization under conditions of uncertainty are especially problematic. Several other generic examples of behavior are irrational in the sense that they do not reflect utility maximization, many of which are based on experiments discussed by Tversky and Kahneman (1981). These examples include situations in which people seem to value gains differently from foregone losses (and losses differently from foregone gains) and confuse out-of-pocket costs with costs associated with foregone alternatives (in economic jargon, "opportunity costs"). In general, most of their criticisms are based on the basic inability of humans to rationalize correctly under unusual circumstances and our use of common heuristics in placing decisions and choices into categories. From their work and the many others that have influenced, the following have been offered as further challenges to rationality theory:

Economic agents fail to ignore sunk costs

Sunk costs have already been spent and cannot be recovered; therefore, they are irrelevant to decisions. Examples of sunk costs might be a baseball manager using his top-paid player, even if that player is not performing well on the field or committee members demanding that their findings not go to waste irrespective of the findings themselves.

Psychologists contend that they have found evidence of ignoring sunk costs in some of their studies (e.g., Arkes & Blumer, 1985; Tversky and Kahneman, 1981). For instance, Tversky and Kahneman reported a series of scenarios where college students would choose to make decisions that were influenced by a perceived loss of income. In these cases, participants would risk changing one's line of thought in order to justify a way to replenish what has been lost.

Rebuttal - economic agents fail to ignore sunk costs: While there is some truth to the fact that no one is able to fully calculate their perfect optimization, the argument above is not conclusively supported by the examples if not all influential variables are identified. If there are other factors beyond the sunk costs, and these other factors are important and perhaps changeable, then one is not necessarily finding a non-rational conclusion at all. For instance, baseball managers may also be influenced by outside peer pressures from fans or upper management. It might indeed be the case that fans

want to see the star irrespective of his performance, and this would be a mitigating factor. Findings that one has determined with diligent effort have more utility to the committee members who worked on the project or report. It is then not only the utility of the findings themselves but also the increased utility of the report that may generate different behaviors than what the misused standard model would predict.

Economic agents tend to behave based on recent examples or frequently heard examples:

Although psychologists tend to characterize behavioral changes that are based on subsequent reinforcers or punishers in the environment, there has been substantial evidence to suggest that more recent consequences of a behavior can influence future actions more than an overall evaluation of past experiences (e.g., Kassinove & Schare, 2001). This study demonstrated that college students who "come close" to winning at a computerized gambling task tend to view their future chances of gaining a big win as more likely, and they increase their gambling behaviors. Thus, the recent event compromised one's ability to judge the true probabilities of winning during the gambling period.

Such a lack of rational behavior can also be seen in decision-making during sporting events. Both athletes and coaches rely on "hot hands" and recent streaks of success to make decisions in critical moments of games (Raab, Gula, & Gigerenzer, 2012; Vergin, 2000). For instance, volleyball players and coaches will make choices of player selections and rotations on the basis of more recent positive contributions during a game. Although there is still debate as to whether such choices are optimal for athletic teams, the literature suggests that such decisions are guided more by intuition rather than rational judgment.

Rebuttal - economic agents tend to behave based on recent examples or frequently heard examples: The standard model with uncertainty (see von Neumann & Morganstern, 1944) easily explains that new information can sometimes be more important than older information, but it depends entirely on whether the information is serially random or non-random. Determining true randomness is extremely difficult, even for scientists, who make predictions about how phenomena like global warming, cell phone usage, and consumption of trans fats will have impacts on society. All of these predictions are based on more recent events, and they sometimes assume randomness in the observations that are made. It could be argued instead that people behave this way because they are unsure of whether something is truly random or not. After all, many people find statistics a difficult course.

An alternative explanation for the reliance on new information may relate to the effects on memory. Cognitive and behavioral psychologists have indicated that when memories are stored, their ease of retrieval (when needed) is heavily influenced by the learning and storage of more recent experiences (e.g., Wixted, 2005). This effect, called retroactive interference, can easily apply to a reliance on newer information, as it is more clearly accessible when making judgments in the present. Regardless of how rational an economic agent may be, he or she will make judgments based on information that he or she perceives as clear and logical, but some information might not be evident (and thus, that may be older information).

Economic agents tend to measure marginality in percentages instead of absolutes:

Classical research in human perception has been heavily based on Weber's Law, which has stated that one's ability to discriminate between two stimuli is based their proportional difference rather than by their specific variations of measurement (for a review, see Murray, 1993). While recent work has cited this classic principle in correlations between decision-making and inherent, physiological activity (Billock & Tsou, 2011; Romo et al., 2003), other fields such as economics have also adopted its premise into explaining more practical behaviors (e.g., Webb, 1961). An example of this can be seen in personal reactions for consumer products. For example, one might go all the way out past the mall to buy a book for \$5 less at a local bookstore, but a similar monetary discount for an automobile would not elicit a similar reaction. In other words, the monetary units for a perceived discount would have to be proportional to the increased amount of the product.

Rebuttal - economic agents tend to measure marginality in percentages instead of absolutes: This particular argument is easily explained away within the standard economic marginality modeling. It is well known that in equilibrium, a consumer will follow Gossen's Second Law, sometimes referred to as the equi-marginal principle: $\frac{MU_1}{P_1} = \frac{MU_2}{P_2} = ... = \frac{MU_n}{P_{n1}}$, i.e. the "bang for the buck" ratio will be the same for all goods and services when an individual is optimizing. However, people are simply unable to match a bang for the buck very well if the prices and marginal utilities are high. For instance, if the next hotdog gives one 10 "utils" of short term happiness and costs \$1, then the bang for the buck will be 10. However, if the next car one purchases gives 154,390 utils (assuming one can be that accurate) and gives on-going utility for several years, costs \$22,100 and is financed over 5 years at a 8% loan rate that is "front loaded" with the interest payments being the highest at the beginning and lowest at the end of the loan, how is this ratio going to change if \$5 is added or subtracted from the total? At this level, it has so little influence on the bang for the buck ratio that it is effectively not measurable. Even if the car had been paid for up-front and all of the 221,000 utils were short term like the hotdog, the ratio would be 10 too; but if the price changes to \$22,105, the ratio is 9.9978, which is indecipherable from 10. This is the real reason, not the seeming percentage idea.

In some decision-making circumstances, behaviors may be explained by underlying influences that circumvent an inability to measure marginal outcome differences. A good example of this pertains to perceptions that involve voting. From an economic standpoint, voting is largely a waste of time, considering the minimal chance that one's individual vote affects the outcome of an election. No matter what the voter chooses, the choice will not determine the voter's utility, and therefore, the voter might just pick the first alternative that he/she sees. However, the utility of voting might simply come from a satisfaction of participating in one's civic rights. A voter might get satisfaction from having been part of the process rather than impacting the process. Individuals will appreciate choices when they can contribute to personal utility, such as the notion of voting affirms a sense of community service. If the choices consume time without bringing increased value (i.e., one sees no personal utility in even going through the voting process), then such choices will be avoided since they may likely cause negative utility.

Economic agents are influenced by framing:

Behavioral theorists claim that the framing of decisions matter. They claim humans are risk averse and losses cause more negative value than gains create positive value. Framing can change the choice even though the payoffs are the same. The expected utility model suggests that the framing of the alternatives have no effect on the decision, but Tversky and Kahneman (1981) showed the opposite. They asked a group of people to choose between A) saving 200 lives, or B) save 600 lives with a probability of 1/3 and zero lives with a probability of 2/3. Another group was asked to choose between C) having 400 people die, or D) 1/3 probability that no one will die, and 2/3 probability that all 600 will die. Although A and C are exactly the same, the choices made were drastically different. The majority chose alternative A, which can be explained by "lives saved" being seen as gains, causing the people to be risk averse in choosing between A and B. The "deaths" being seen as losses caused the people to be risk seeking in the choice between C and D (Frank, 2000). By using a reference point, this model takes into consideration one's starting-point that many times reflects decisions. The model also incorporates the reluctance of giving something up, which is often replicated in human behavior. The classical expected utility function starts from an absolute base that is the same for everyone and makes no difference between the magnitudes of gains versus losses. Since these variables are worth taking notice of, the updated utility model is preferred.

Rebuttal - economic agents are influenced by framing: An individual's utility curve can vary depending on the day. What makes a person happy one day might not seem as appealing the next day. It is rational to act in a way that will yield the highest utility and if the mood affects the satisfaction of a behavior, that behavior will be increased or decreased depending on the outcome. Why a loss in an international soccer game has an effect and while a win has essentially no effect can be explained by the value function that is steeper for losses than for gains. This argument is also explainable through the standard marginality model in that all standard model predictions are always done under *ceteris paribus* assumptions. Here, as soon as they change the methodology of asking the question, there is a change in the assumption. The standard model would ask instead, "Would you prefer '500 of the 600 were saved or 510 of the 600 were saved?'" By asking the question legitimately, one can easily get a consistent and conclusive answer. All anchoring and adjustment examples ignore the principle of *ceteris paribus*, without which, no scientific arguments can be verified. This is why natural sciences use controlled experiments. Only then does the scientist know that the variable in question was the reason for the changes, but such controlled conditions limit the widespread interactions among variables that can be seen in the real world.

Economic agents satisfize rather than maximize:

Herbert Simon (1955) contended that alternatives are examined sequentially and that a choice might be made when the first satisfactory alternative is found. Humans are satisfied after reaching a certain requirement, and when this threshold is reached, they will not keep looking for a different option to seek additional payoffs. The aspiration level, which defines a satisfactory alternative, can change during a sequence of trials depending on the difficulty of finding satisfactory alternatives. The easier it is to obtain satisfactory alternatives, the higher the aspiration level. Changes in the aspiration level guarantee the existence of satisfactory solutions in the long run, but

contrary to the rational choice theory, it is not required to know all the payoffs. Individuals might not know all of the choices at the same time in order to evaluate them prior to the decision-making. To be able to set a rational acceptance price as the seller, complete information is needed on the probability distribution of offers for all relevant time periods. Most of the time, the seller does not have all of this information; therefore, he/she is required to make approximations on the sale price at which he/she will be able to sell and is willing to sell within a certain time period. The initial acceptance price will be set relatively high, and then adjustments are made depending on the offers received. This rational adjustment is what makes humans "satisficers" who are content with "good enough" (Simon, 1955).

Rebuttal – economic agents satisfize rather than maximize: The adjustment process of the aspiration level is rational since the difficulty of finding satisfactory alternatives could be expressed as the information cost. Attention is limited and all information might not be obtained; however, individuals will behave as to get the most out of the situation. If selling a house, the seller might obtain more negative utility of waiting for an even higher offer rather than going with the satisfactory offer already received. Therefore, being a "satisficer" rather than a "maximizer" in this case is the rational thing to do since it is the behavior that, in fact, maximizes the utility.

Some classic experiments

In addition to contributing criticisms of rationality theory, many behavior economics experiments have been performed over the years that have been used to supposedly show irrational behavior. Some have become textbook classics. Three of those experiments are as follows:

1) *Dictator game experiment*
2) *The gift exchange experiment*
3) *Irrelevant alternatives experiment*

Similar to common empirical criticisms, each of the three classic experiments is explained and rebutted below.

Dictator game experiment

In the Dictator Game Experiment (Forsythe et. al., 1994), a subject, the dictator, has an endowment of $10 and chooses how much of the $10 to transfer to an anonymous partner. While the standard theory of self-interested consumers predicts that the dictator will keep the whole endowment, Forsythe et. al. (1994) found that 60% of subjects transfer a positive amount.

Rebuttal - dictator game experiment: The utility function can include benefits received by others, and therefore, the choice of giving some of the endowment away can increase the dictator's utility. The risk of being perceived as greedy can bring negative utility to the dictator and might also influence the decision of giving. Individuals act according to their own unique utility curve. When a behavior is assumed to be irrational it can most likely be explained by the individual's personal utility function, or the fact that the situation did not follow *ceteris paribus* assumptions. Emotions, social pressure, and empathy all have an effect on behavior, and in order to maximize utility, individuals avoid behavior that causes negative

utility. Consider the scenario in which an outside source tells two people to share $1000. One of the two is chosen to make an offer and no compromises are allowed; the deal is either taken or both parties end up with nothing. Critics of rational choice theory say that it is irrational to decline the offer, since no matter the amount of the offer, both parties will end up better off than without a deal. When looking at different aspects that yield utility, it is not difficult to see why the offer might be declined. Say the person making the offer chooses to keep $999 while presenting the other person $1; in this scenario, the satisfaction of not letting the greedy person get the $999 is much higher than receiving $1. Therefore, the behavior is most definitely rational and rationality theory holds true.

The gift exchange experiment

Fehr, Kirchsteiger, and Riedl (1993) have attempted to empirically characterize the relationship between employers and employees in what they called "the gift exchange experiment." In the labor market, the firm decides a wage. The employee observes the wage and responds by choosing an effort level. Standard theory predicts that the employee, no matter what the firm chooses, exerts the minimal effort, and the firm offers the lowest wage possible that satisfies the participation constraint for the employee. Fehr, Kirchsteiger, and Riedl (1993) found that employees respond to a higher wage by providing a higher effort. Firms respond by offering a wage above the market clearing one.

Rebuttal - the gift exchange experiment An employee that receives minimal utility from working will exert as little effort as possible. However, an employee that values job titles and positions will see the opportunity of future promotions, which brings higher utility and motivates the employee to put in the extra effort. If the firm sets a wage above the market clearing one, the employee receives extra encouragement to keep responding positively and obtain even higher utility.

Irrelevant alternatives making a difference

A difficult bundled choice (e.g., voting for president) is changed on one new (irrelevant) piece of information; Tversky's (1969) famous example of the monthly rent vs. distance from campus dilemma is being decided by an irrelevant alternative. The apartments differ along two dimensions, monthly rent and distance from campus. When the only alternatives are A and B, the choices are 50/50; however, when alternative C is added, the majority chooses B.

Rebuttal – irrelevant alternatives making a difference: This argument is predicated on the idea of "irrelevancy," which is difficult to determine and to some extent subjective. First, with new information made available, a person might legitimately use the extra information to develop a more precise measure; that is, new data (especially under small observation cases) immediately changes the measures of central tendency and dispersion around the mean. With a new mean and standard deviation, it is possible to interpret choice differences from another perspective. After all, it is reasonable to ask why the new information changed the parameters. If it did, could it be possible that there is more information being conveyed? For instance, in the monthly rent example, might the new data reflect more than just price and distance differences, such as safety or noise?

A Replication of Tversky's Experiment of Irrelevant Alternatives

According to rationality theory, adding a third irrelevant variable to a decision between two primary alternatives must not cause a change in preference. This has been criticized and Tversky did the "monthly rent vs. distance from campus" experiment to prove his point. The experiment did not satisfy *ceteris paribus* requirements and is therefore not scientifically sufficient. To see if another experiment would yield different results, we tested the importance of irrelevant alternatives with 104 psychology students participating. The participants were provided with two scenarios (see *Appendix)* regarding graduate/professional school (operationally defined as any accredited organization, e.g. medical school, law school, business school, nursing school). The first scenario presented the acceptance into two of the top schools chosen, University A and University B. University A has a tuition rate of $50,000 per year and has the reputation of being a "Top 10" school in the country, based on the successful careers from its graduating students. University B has a tuition rate of $30,000 per year and has the reputation of being a "Top 50" school in the country, based on the successful careers from its graduating students. 40% of the participants chose University A and 60% chose University B. A second scenario was presented where an acceptance letter from a third organization, University C, was received. University C has a tuition rate of $40,000 per year and has a reputation of being a "Top 200" school in the country (note that there are approximately 250 schools in this profession) based on the successful careers from its graduating students. After adding the alternative of University C, the responses remained; the same 40% chose University A and the same 60% stuck with University B. These results support rationality theory by showing that the irrelevant alternative did not have an impact on the decision

Summary

An unsuccessful decision does not mean that it is an irrational decision. Sometimes choices just do not work out the way they are planned. Focus is a limited resource in which humans become easily distracted. In order to act rationally at all times, it is necessary to keep informed about all alternatives and possible outcomes, all of which require focus. This can explain the self-control problems shown in health and diet experiments. Referring back to a previous example, people with plans on exercising and smoking cessation are full of hope and motivation; however, after some time, many of them choose to binge eat and light another cigarette. This can be explained by limited focus and lack of concentration on the outcomes. When individuals are constantly reminded of the reward that is to be expected, they are more likely to keep working in order to achieve it, which can explain the success of personal trainers. Many athletes have the knowledge to set up the workout routine they receive from their personal trainers; nevertheless, they want the constant reminders and motivation to keep focused on their goal.

The extensive amount of criticisms toward rational choice theory is to be expected. We are not likely to attain complete knowledge about anything, especially social phenomena, any time soon. To paraphrase Winston Churchill, rational choice theory may well be the worst social science methodology ever invented, except for all the others. We should be open to the insights provided by rational choice theory without embracing the approach with religious fervor. The approach can be and has been

extremely useful. It should not be discarded in favor of other approaches except in extreme modeling situations.

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Appendix

Graduate School Scenario

The following is a brief survey that will attempt to assess undergraduate perception of graduate/professional school admittance. Graduate/professional school is defined as "any accredited organization (e.g., medical school, law school, business school, nursing school, graduate school in any other major) that provides the skills and credentials to enhance professional success in a chosen field." All answers will remain anonymous and confidential, as no names will be tracked to individual responses.

First, on a scale of 1 to 5 (where "1" denotes "no interest" and "5" denotes "absolute interest," please rate your future interest in attending graduate/professional school

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        1---------------2-----------3-------------4----------------5
     No Interest                                        Complete interest
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Please read the following scenarios and answer each of the questions to the best of your ability.

"You have applied to an array of graduate/professional schools in your chosen field. Based on your educational background and professional development, you have been accepted into your two top choices, University A and University B. In order to make your decision, the following is known about both institutions:

1.) University A has a tuition rate of $50,000 per year and has the reputation of being a "Top 10" school (in the country) based on the successful careers from its graduating students.

2.) University B has a tuition rate of $30,000 per year and has the reputation of being a "Top 50" school (in the country) based on the successful careers from its graduating students.

Based on these two acceptances, which school would you choose? Please choose University A or B.
University A ____   University B ____

"A week later, you receive an acceptance letter from a third organization, University C, which offers you admission to its school. University C has a tuition rate of $40,000 per year and has a reputation of being a "Top 200" school (note that there are approximately 250 schools in this profession) based on successful careers from its graduating students.

Based on acceptances from all three schools, which school would you choose (Please choose one)? Please choose University A, B, or C.
University A ____   University B ____   University C ____

Thank you for your participation!