International Journal of Commerce and Management Research
ISSN: 2455-1627; Impact Factor: RJIF 5.22
Received: 31-01-2019; Accepted: 02-03-2019
www.managejournal.com
Volume 5; Issue 2; March 2019; Page No. 105-110

Relationship between the bias towards the present and the intertemporal choice

Carlos Gabriel Borbón Morales[1], Eduardo Leyva León[2], Marisol Arvizu Armenta[3*]
[1, 3] Centro De Investigación En Alimentación Y Desarrollo AC Hermosillo, Sonora, México
[2] PhD Student at Centro De Investigación En Alimentación y Desarrollo AC Hermosillo, Sonora, México

Abstract
According to the behavioral economics approach, it is assumed that people are inconsistent when making choices at different moments in time, among them is the bias towards the present, (tendency of individuals to give greater importance to the rewards close to a present time). The objective of this article is to relate the intertemporal choices of 84 young adults, their gender and the bias towards the present. Through a quasi-experimental design using a choice test, it was found that 45% present bias towards the present in their choices. No statistically significant differences were found between age, time to choose and bias in the elections; on the other hand, significant differences were found regarding sex and bias towards the present. The results show that the participants' choices are not consistent.

Keywords: intertemporal choice, bias towards the present, behavioral economics, quasi-experiment

1. Introduction

The decision-making process has been approached from various disciplinary fields; such as ethics, where the individual decides what action is most appropriate; the moral, which action is more good; from the epistemological and theoretical part, which action is more rational (Arredondo & Vázquez, 2013) [3]; in economics, where people choose rationally in terms of maximizing utility (Becker, 1962) [5]; or from psychology, which is responsible for studying the factors that determine and generate the behavior of people when making a decision (Katona, 1951) [21]. Despite the different levels from which decisions can be taken, the purpose is common: it is aimed at defining a course of action, guided by a process of choice to solve a problem (Moody, 1991) [32].

Given this, people face such simple and everyday dilemmas as: deciding to go to the gym, when to start studying or doing a job, when to start a diet. Even more complex ones such as: saving for retirement, borrowing by means of credit cards or some other source of financing. They often require making decisions that involve moments in time (Meier & Sprenger, 2015) [30]. These are known as intertemporal choices, which involve decisions in which the distribution of costs and benefits extend over time (Loewenstein & Thaler, 1989) [27]. Given this, the choices of individuals play an important role, because they arise from rational choices, from the level of standard economic theory, or real options that are seen from the behavior, at the time when people decide between the alternatives (Samson, 2016) [40].

In recent years, studies have proliferated in relation to intertemporal choice: from the economy, emphasizing the bias towards the present; from psychology referring to problems of self-control (Delaney and Lades, 2017). These studies include Yang (2016) [47], Adamkovic and Martoncik (2017) [1] and Dean, Schilbach, and Schofield (2017) [13]; where the three are review and theoretical contribution. In these the theme of poverty and intertemporal choice is linked; in which poverty has a strong psychological burden. These studies concluded that poverty leads to a cognitive shortage also known as cognitive load in the individual, which leads to intuitive thoughts, which can be biased toward the present in intertemporal choices. However, to understand the notion of bias towards the present, it is necessary to start with a recount from the economic model of intertemporal choice.

1.1 Economic model of intertemporal choice: discounted utility

One of the classic studies that has been representative of the choices and temporal preferences is that established by Strotz (1956), who proposed a model of stationarity of preferences, which was responsible for revealing how the temporal distance affects the order of The preferences. However, Calderón, Elbittar and Lever (2004) [7] mentioned that the standard model for decisions over time is influenced by consumer theory, which has the following assumptions: 1) the preferences of individuals given by goods are fixed through time; 2) Completeness: based on two types of goods, individuals are able to decide the basket they prefer or if it is indifferent; and 3) Transitivity: there must be a fixed order of the preferences of individuals between two or more goods.

The discounted utility model has been the subject of intertemporal choice research, from the perspective of economists such as John Rae, Böhm-Bawerk, Irving Fisher and Paul Samuelson (Frederick, Loewenstein and O'Donoghue, 2002, and Muñoz and Cruz, 2005) [16, 33]. In addition, it combines the assumptions of consumer theory and the model of stationarity of preferences (Strotz, 1956).

The discounted utility proposed by Samuelson (1937) [41] assumes that individuals discount future events at a constant speed. So, the value of an experience in time is given by:

$$U_0 = \sum_{t=0}^{T} \delta^t u_t$$

Where U_0 is the present value of the experience, u_t is the utility to be obtained at time t, and δ is the discount factor,

which is usually assumed δ <1 (Read & Loewenstein, 2000) [38]. Along with the proposition of this model some other assumptions emerged, such is the case of consistency over time, this indicates that a person's intertemporal preferences are consistent over time, which means that subsequent preferences confirm preferences. Previous (Frederick, Loewenstein and O'Donoghue, 2002) [16].

1.2 Intertemporal choice: A perspective of behavioral economics

In the last decades the panorama in which the discounted utility was, as it is the case of the intertemporal elections represented by the model of Samuelson (1937) [41], has changed following several experimental studies made from the cognitive psychology by the authors (Tversky and Kahneman (1974) [46], Ainslie (1975) [2], Kahneman and Tversky (1979) [19], among others, in which a series of anomalies (biases), attributable to a limitation in the processing of information, that people commit In addition, continuity is given to the experiments carried out in the heuristic and bias program, and it is established that economic decision-making is not only about obtaining the greatest utility, but also depends on a point of reference that is linked to the election.

Later, and from the experimental economy (Thaler (1981) [44, 45], Loewenstein and Thaler (1989) [27], Loewenstein and Prelec (1992) [28], Laibson (1997) [23] and O'Donoghue and Rabin (1999) [35], where they exposed the real behavior of the individual when It is faced with a series of alternatives at different points in time.This behavior is guided by temporal preferences, evidencing anomalies or inconsistencies in the intertemporal choice that arose in the theory of expected utility.

1.3 Temporary preferences

Temporal preferences have been a dimension that explains the concept of intertemporal choice (Read and Loewenstein, 2000, Frederick, Loewenstein and O'Donoghue, 2002, Klein, 2003, Calderón, Elbittar and Lever 2004, Harrison and Swarthout, 2011) [38, 16, 22, 7, 17]. People constantly make choices that involve gains or losses at a present time or in the future (Doyle, 2013). Temporal preferences, also known as temporary discounts, affect the valuation that individuals have of rewards, mainly money or goods, at different points in time, where it is observed that generally immediate rewards outweigh future rewards (Frederick, Loewenstein, & O'Donoghue, 2002) [16].

Based on Strotz (1956), the exponential discount, that is, the function of discounted utility, mentions that the preferences of people over time do not change, despite the fact that time has passed. However, the empirical evidence shows that in many occasions people are inconsistent in their temporal preferences (Meier and Sprenger, 2010, Can and Erdem, 2013, Carvalho, Meier and Wang, 2016) [29, 9, 11].

1.4 Quasi-Hyperbolic Discount or Bias towards the Present

Among the anomalies that bias the elections are: the magnitude effect that implies that a larger amount suffers a lower proportional discount; the sign effect: that is observed when individuals have anxiety to receive positive rewards; term effect: discounts tend to decrease as the waiting time is longer; the hyperbolic discount: the discount factor has a pronounced decrease for moments in time that are closer to the present (Read and Loewenstein, 2000) [38], the bias towards the future: when future rewards are preferred over the present rewards (Dougherty, 2015) [14], as well as the quasi-hyperbolic discount or bias towards the present: immediate rewards over future rewards are preferred (O'Donoghue & Rabin, 1999) [35]. Both the bias towards the present and the bias towards the future are relevant, because they act as indicators of temporal preferences within intertemporal choices (Meier & Sprenger, 2010) [29].

The quasi-hyperbolic discount and the bias towards the present are represented by the same model, in which it is observed that individuals present a bias due to immediacy. This has been based on the contributions made by Strotz (1956), Phelps and Pollak (1968) [37] and Laibson (1997) [23], where an additional factor to the function was introduced, which represents the bias towards the present (Patiño and Gómez, 2015) [36].

The bias towards the present arises when an individual considers exchanges between two future moments, where it gives greater preference to the moment that is closest to the present (O'Donoghue & Rabin, 1999) [35]. This model is given by:

$$U^t(u_t, u_{t+1}, \dots, u_T) = \delta^t u_t + \beta \sum_{T=t+1}^{T} \delta^T u_T$$

While β represents the bias for the present, if it is close to one it means that the bias is minimal, on the other hand, if it is close to zero it indicates that there is excessive immediacy on the part of the individual (O'Donoghue and Rabin, 1999) [35]. However, if β = 1 then the model would be returned to the exponential. Figure 1 shows the difference between the exponential or standard discount, the hyperbolic and the quasi-hyperbolic or bias towards the present.

It is shown that the hyperbolic and quasi-hyperbolic discount have a different behavior from the standard exponential discount, however the quasi-hyperbolic discount presents a different function, where a significant decrease of the value towards the present time is appreciated. This means that there is a bias towards the present where β <1.

These intertemporal discount models have contributed to explain many of the phenomena in the behavior of individuals, mainly those that have focused on saving and consumption of goods (Loewe, 2009) [26]. In several investigations the bias towards the present has been evidenced: Kahneman and Frederick (2001) [18], mention that a person who makes biased judgments is acted intuitively, this means that he has automatic thoughts and it takes him little time to decide.

The study made by Meier and Sprenger (2010) [29], established the relationship between the bias towards the present and credit card loans. Carried out through a quasi-experiment in a field context, where the participants were presented with a series of amounts at different time points. The results of this work showed that individuals with a bias towards the present are more prone to borrowing with credit cards. On the other hand, Carvalho (2010) [10], conducted a study in which the temporal preference is estimated in poor households in a rural area of Mexico. The results showed that: poor households show bias towards the present in their temporary preferences. They mention that future research on this subject should focus on the differences in temporary

preferences that arise between the poor and the non-poor.
Can and Erdem (2013) [9], carried out a study to characterize the bias towards the present and problems of self-control among a group of individuals with different incomes. What they found was that people with low incomes and older were more biased towards the present.
In relation to the cited studies on intertemporal choice theory, the objective of this study is to relate the intertemporal choices of 84 young adults, their sex and the bias towards the present.

2. Materials and Methods

2.1 Research Design and Participants

We used a quasi-experimental design, because we worked with intact groups of students (already established), which implies a lack in the randomization of the participants and control a total control of external variables (Campbell and Stanley, 1995) [8]. A sample of 84 university students (31 men and 53 women) from the city of Hermosillo, Sonora in northwestern Mexico, was intentionally selected. Where, the average age of the participants is 21 years, of which 96% are from Sonora and 4% are born out of the state.
The participants signed a written consent specifying the purpose of the study, the application of the instruments and the procedures that would be carried out with the data obtained. It was also defined that the participant was free to collaborate or withdraw from the study if he so wished, however, there was no student who refused to participate.
Based on the theory of intertemporal choice, the choice test was selected as an instrument since it provides the types of bias that can be presented when choosing. In addition, this test is the most used by authors working on this topic (Meier & Sprenger, 2010, Can & Erdem, 2013, Carvalho, Meier & Wang, 2016 and Nguyen, 2016) [29, 9, 11, 34].

2.2 Instrument and Measures

The instrument was applied to pencil and paper and is divided into 2 sections: 1) Sociodemographic variables, which include the age, sex and place of origin of the participants. 2) Variables of Temporary Preferences: Participants answered an election test using a hypothetical incentive. The test consists of 19 elections divided into three blocks: 1) t = present vs T = 1 month; 2) t = present vs T = 6 months; 3) t = 6 months vs T = 7 months), each one presents a lower reward in the times closest to the present, ranging from MXN $ 1,550 to MXN $ 1,000, while in the periods furthest from the present one establishes a greater fixed reward with a value of MXN $ 1,600. The applications were carried out in the university classrooms and they took the time to have a record of the time at which they began the test and when they finished it. The above to know the time it took for the participants to take the test.
Temporal preferences are measured using the election experiment mentioned above (choice task), where decisions are analyzed in two lists of multiple rewards. Using the information produced by the different points in time (present and future), we obtain a measure of individual discount factor (IDF), which not only allows the identification of the discount type (exponential or quasi-hyperbolic), but also the identification of the existence of bias towards the present or bias towards the future (Meier and Sprenger, 2010) [29].
The discount factor is obtained when a switching point in the election is observed in the choice experiment; that is, change from choosing the small reward to choosing the big reward. For example, if an individual prefers $ 1,550 today over $ 1,600 in a month, but prefers $ 1,600 in a month over $ 1,400 today, then the $ 1550 is taken as a change point and the discount factor (1550/1600) =.968 is calculated.
The bias towards the present is calculated based on the discount factor. If a person is more patient (has a low IDF) when he chooses a small and close reward in time (t = 0); then the individual is considered to be biased towards the present if 〖IDF〗 _0.1 < 〖IDF〗 _6.7, and is biased towards the future if 〖IDF〗 _0,1> 〖IDF〗 _6.7. When a person is biased toward the present is considered as dynamically inconsistent (inconsistent in their choices). While to obtain the parameters β and δ, the following IDF measurements were used according to Meier and Sprenger (2010): δ = 〖IDF〗 _6,7; β = 〖IDF〗 _0,1 / 〖IDF〗 _6,7.
An important result related to the bias is the radius. This indicates the intensity of the bias: in the case of present bias the radius will be greater than 1 (eg 1.01, 1.06, 1.10), the further away from the radius the intensity of the bias towards the present is higher. On the other hand, when there is a bias towards the future, it will be less than 1 (eg,.986,.902,.877), the farther from the 1 the greater the bias towards the future. And when there is consistency will be equal to 1, this indicates that the person behaves as mentioned by the exponential discount (discounted utility).

2.3 Data analysis

Regarding the analysis of the data, the statistical program SPSS v20 was used. Descriptive measures of sociodemographic variables and temporal preferences were obtained. They also applied Chi square tests (X ^ 2) for sex and bias; ANOVA for age, time to choose and bias; the test t for sex and radio. To perform the indifference point curves of the discount factors, a non-linear regression was applied in the Graphpad Prism 6 program.

3. Results & Discussion

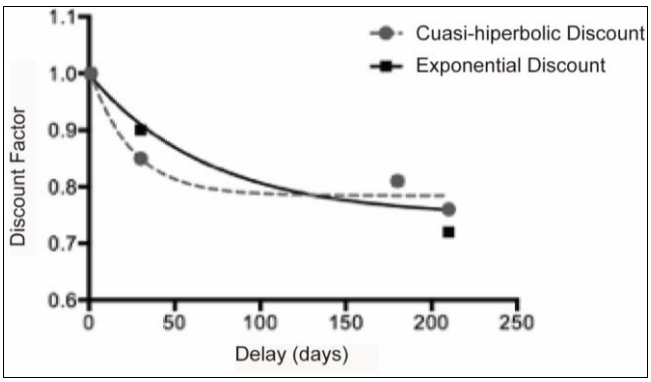
Results should be the major findings of your experiment. You have to compare the results with previous studies done in same. Table 1 shows the descriptive statistics of the sociodemographic variables (described in the section on research design and participants) and the temporal preferences of the participants. The table is divided into the total of students who participated, those who show the bias towards the present, the bias towards the future and those that are consistent in their preferences. It was found that 45% of the participants showed bias towards the present in their choices, 22% were biased toward the future and 33% showed consistency in their temporal preferences.
Regarding the measurement of the bias, it was observed that 71% of women have a bias towards the present, while 63% of men have bias towards the future. Obviously students with a bias toward the present predominate, this implies a greater sense of immediacy when making their choices. While the mean of the total sample of the individual discount factor (IDF), was M =.912 ±.06, and according to the participants biased towards the present their IDF was M =.920 ±.04. This indicates that although a high percentage of participants have a bias towards the present, this does not represent an intense bias; this also agrees with the radius of the sample M = 1.03 ±.10, and the radius of the group biased towards the present M = 1.11 ±.08.

Table 1: Statistics of the Sociodemographic and Temporary Preference Variables.

	All participants	Participants with present bias	Participants with future bias	Consistent participants
Sociodemographic variables				
Age	21.3 (1.74) [84]	21.4 (1) [38]	21 (1.79) [18]	21.3 (2.42) [28]
Sex				
Fem.	.63	.71	.33	.71
Masc	.37	.29	.67	.29
Origin				
Hermosillo	.78	.79	.83	.75
Other city	.18	.16	.17	.21
Otro Estado	.4	.5	0	.4
TeMporal preferences				
Individual Discount Factor	.912 (.06)	.920 (.04)	.882 (.07)	.914 (.07)
Present Bias	.45	1	0	0
Future bias	.22	0	1	0
Consistent	.33	0	0	1
Radio	1.03 (.10)	1.11 (.08)	.900 (.07)	1
Choosing time	3.29 (1.25)	3.15 (1.17)	3.16 (1.15)	3.57 (1.42)

Note: The table shows means and frequencies, standard deviation in parentheses and the number of observations in brackets.

As for figure 1, it shows a comparison of the means of the quasi-hyperbolic and exponential discount factor, of all the participants according to the delay of delivery of the economic reward. Where β =.90 and δ =.95 for the quasi-hyperbolic discount and δ =.90 for the exponential discount.

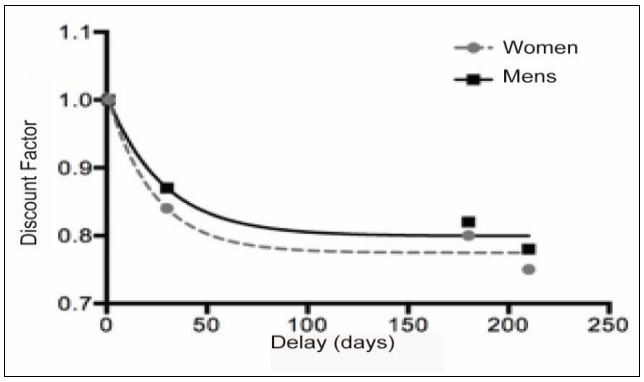


Source: Self-made.

Fig 1: Comparison of the Exponential and Quasi-Hyperbolic Discount.

The figure shows that the quasi-hyperbolic function is discounted more quickly than the exponential, where a greater decrease of the value towards the present time is appreciated.

Figure 2 shows the differences in the means of the quasi-hyperbolic discount factor according to sex. Where β =.89 and δ =.95 for women, while for men it is β =.92 and δ =.95.



Source: Self-made

Fig 2: Quasi-hyperbolic discount by sex.

It was found that according to sex, they discounted time in a very similar way. The discount rate for women was slightly higher (k = 0.04, R ^ 2 =.96) than that of men (k = 0.03, R ^ 2 =.97). In women there is a slight decrease in value in the present time, in relation to men. When applying a hypothesis test it was observed that there are statistically significant differences between the bias and the sex of the students χ ^ 2 (2, N = 84) = 8.71, p <0.05.

The estimated age of the participants in relation to the present bias was 21.4 ± 1. However, the results of the hypothesis test do not show a statistically significant difference F (2) 0.287, p> 0.05. The average time, measured in minutes, that it took them to choose the participants was 3.29 ± 1.25, while for the participants biased towards the present the time it took them to choose was 3.15 ± 1.17. No statistically significant differences were observed in the applied test: F (2).993, p> 0.05. Regarding the radio, it was found that on average the participants showed an average of 1.03 ± 0.10. In the case of women, the radius was 1.05 ± 0.10, while in men it was 0.995 ± 0.10. When a hypothesis test was applied, the results showed statistically significant differences t (82) = 2.48, p <0.05. This indicates that the bias towards the present is slightly more intense in women than in men. This result agrees with what is shown in figure 2.

4. Conclusions

The intertemporal choice has gained importance within behavioral economics in recent years. In the present quasi-experiment two aspects of behavior are pointed out when making temporary choices: rewards discount and bias towards the present.

The results obtained in the discount of the rewards are adapted with the established in the theory (Laibson, 1997, Berns, Laibson and Loewenstein, 2007, Vanderveldt, Oliveira and Green, 2016) [23, 6], because the quasi-hyperbolic function is discounted with faster in time than the exponential function. This indicates that there is a greater level of impatience in the participants for receiving immediate rewards. In turn, this disturbance is observed slightly higher in women than in men.

Regarding the quasi-hyperbolic discount, it is established that the results of bias towards the present are adjusted with the studies indicated above (Kahneman and Frederick, 2001, Meier and Sprenger, 2010, Tanaka, Camerer and Nguyen,

2010, Can and Erdem, 2013; Carvalho, Meier and Wang, 2016) [18, 29, 43, 9, 11]. Since a relationship between sex, bias and radius was found, it can be said that participants present a bias towards the present when making choices. In the study, women tend to be more inclined toward present bias and consistency, while men are more biased towards the future. This indicates that women are more eager to receive immediate rewards.

While it is true that in relation to age and time to choose, there was no relationship with bias and radio, these results may be due to the use of a test of choice with hypothetical rewards. As presented in Chapman *et al*. (2001) [12], Kapteyn and Teppa (2003) [20] and Rubinstein (2003) [39], this means that participants can not be capable of the imaginary act required (Locey, Jones and Rachlin, 2011) [25].

The analysis of intertemporal choice has its beginnings properly in the mid-eighties and has been replicated mainly in Anglo-Saxon populations. This theoretical approach is still under construction as the results are still being valued in different socioeconomic contexts, populations and test scenarios.

In relation to the experimental arrangement that uses behavioral economics, university students have traditionally been used to verify the theory. A justification for this is because the interest of the study is to describe the behavior of individuals.

In this case, following this tradition, we chose to use university participants to analyze their behavior and then be able to contrast the results with intertemporal choice theory, within the context of an average growth city in northern Mexico, as is the case of the city of Hermosillo, Sonora.

The results obtained validate the theory, demonstrating that, at the time of making choices, people have a lack of self-control (avid immediacy). This type of evidence provides knowledge about the behavior of individuals, which can contribute to the management of both public and private policies. For this reason, it is necessary to continue investigating by implementing comparisons at the regional level for example, which will provide more elements to know more about why people assume immediacy in their behavior. The presented results suggest continuing advancing in analysis of the relational type with respect to the intertemporal choice with variables of psychological order that allow to estimate the cognitive functions of the persons or personality; likewise from the economy with disposable income, credit and consumption, among others.

5. References

1. Adamkovic My, Martoncik M. A Review of Consequences of Poverty on Economic Decision-Making: A Hypothesized Model of a Cognitive Mechanism. Front. Psychol, 2017, 8(1784). DOI: 10.3389/fpsyg.2017.01784.
2. Ainslie G. Specious Reward: A behavioral theory of impulsiveness and impulse control. Psychological Bulletin. 1975; 82(4):463-496.
3. Arredondo F, Vázquez J. Un modelo de análisis racional para la toma de decisiones gerenciales, desde la perspectiva elsteriana. Cuadernos de Administración. 2013; 26(46):135-158.
4. Arrow K. Utilities, attitudes, choices: A review note. Econometrica. 1958; 26(1):1-23.
5. Becker G. Irrational Behavior and Economic Theory. The Journal of Political Economy. 1962; 70(1):1-13.
6. Berns G, Laibson D, Loewenstein G. Intertemporal choice - toward an integrative framework. Trends in Cognitive Sciences. 2007; 11(11):482-488.
7. Calderón G, Elbittar A, Lever C. Inconsistencias en la teoría de la elección intertemporal: Un enfoque económico. En C. Santoyo, & F. Vázquez, Teoría Conductual de la Elección: Decisiones que se Revierten México: UNAM¸ 2004, 207-229.
8. Campbell Dy, Stanley J. Diseños Experimentales y Cuasiexperimentales en la Investigación Social. Amorrortu Editores, Buenos Aires, 1995.
9. Can B, Erdem O. Income groups and long-term investment. Economics Bulletin. 2013; 33(4):3014-3022.
10. Carvalho L. Poverty and Time Preference. RAND Working Paper Series WR- 759, 2010.
11. Carvalho L, Meier S, Wang S. Poverty amd Economic Decision-Making: Evidence from Changes in Financial Resources at Payday. American Economic Review, 2016, 260-284.
12. Chapman G, Brewer N, Copus E, Brownlee S, Leventhal H, Leventhal E. Value for the future and preventive health behavior. Journal of Experimental Psychology: Applied. 2001; 7(3):235-250.
13. Dean E, Schilbach Fy, Schofield H. Poverty and Cognitive Function. Capítulo NBER en: The Economics of Poverty Traps National Bureau of Economic Research, Inc, 2017.
14. Dougherty T. Future-Bias and Practical Reason. Philosophers Imprint. 2015; 15(30):1-16.
15. Doyle J. Survey of time preference, delay discounting models. Judgment and Decision Making. 2013; 8(2):116-135.
16. Frederick S, Loewenstein G, O´Donoghue T. Time Discounting and Time Preferences: A critical review. Journal of Economic Literature. 2002; 40:351-401.
17. Harrison G, Swarthout T. Can Intertemporal Choice Experiments Elicit Time Preferences for Consumption? Yes. Working Paper 2001-14 Center for the Economic Analysis of Risk, 2011.
18. Kahneman D, Frederick S. Representativeness Revisited: Attribute Substitution in Intuitive Judgement. En T. Gilovich, D. Griffin & D. Kahneman (Eds.), Heuristics and Biases: The Psychology of Intuitive Judgment. Cambridge University Press, 2001, 49-81.
19. Kahneman D, Tversky A. Prospect Theory: an analysis of decision under risk. Econometrica. 1979; 42(2):263-291.
20. Kapteyn A, Teppa F. Hypothetical Intertemporal Consumption Choices. Economic Journal. 2003; 113(486):C140-C152.
21. Katona G. Psychological Analysis of Economic Behavior. McGraw-Hill, New York, 1951.
22. Klein T. On Intertemporal Choice, Rationality, and Time Consistency. Journal of Economic Literature, 2003, 1-8.
23. Laibson D. Golden Eggs and Hyperbolic Discounting. The Quarterly Journal of Economics. 1997; 112(2):443-477.
24. Lázaro A. Los modelos de descuento hiperbólicos frente al modelo de utilidad descontada: evidencia empírica para cuatro categorías de bienes. VIII Encuentro de Economía Público. Cáceres: Universidad

de Zaragoza, 2001.
25. Locey M, Jones B, Rachlin H. Real and hypothetical rewards. Judgment and Decision Making. 2011; 6(6):552-564.
26. Loewe G. Further Investigations into the Anomalies of Rational Intertemporal Choice. Barcelona: Univesidad de Barcelona, 2009.
27. Loewenstein G, Thaler R. Anomalies: Intertemporal Choice. The Journal of Economic Perspectives. 1989; 3(4):181-193.
28. Loewenstein G, Prelec D. Anomalies in Intertemporal Choice: Evidence and an Interpretation. The Quarterly Journal of Economics. 1992; 107(2):573-597.
29. Meier S, Sprenger C. Present-Biased Preferences and Credit Card Borrowing. American Economic Journal: Applied Economics. 2010; 2(1):193-210.
30. Meier S, Sprenger C. Temporal Stability of Time Preferences. The Review of Economics and Statistics. 2015; 97(2):273-286.
31. Montoya A, Morales S, Ávila R, Nieto J. Descuento Temporal y Probabilístico en el Abuso a la Nicotina. Revista Mexicana de Análisis de la Conducta. 2016; 42(1):13-35.
32. Moody P. Toma de decisiones gerenciales. Bogotá: McGraw Hill, 1991.
33. Muñoz M, Cruz S. Anomalías en elección intertemporal: Obtención de la tasa social de descuento. Almería: Universidad de Almería, 2005.
34. Nguyen Q. Linking loss aversion and present bias with overspending behavior of tourist: Insights from a lab in the field eperiment. Tourism Management. 2016; 53:152-159.
35. O´Donoghue T, Rabin M. Doing It Now or Later. The American Economic Review. 1999; 89(1):103-124.
36. Patiño D, Gómez F. ¿Explican las preferencias cuasi-hiperbólicas la procastinación académica? Una evaluación empírica. Woeking Papers - Serie EC (03), 2015.
37. Phelps E, Pollak R. On Second-Best National Saving and Game-Equilibrium Growth. The Review of Economic Studies. 1968; 35(2):185-199.
38. Read D, Loewenstein G. Time and Decision: Introduction to the special issue. Journal of Behavior Decision Making. 2000; 13:141-144.
39. Rubinstein A. Economics and Psychology? The case of hyperbolic discounting. International Economic Review. 2003; 44(4):1207-1216.
40. Samson A. (Ed.). The Behavioral Economics Guide 2016 (with an introduction by Gerd Gigerenzer). Behavioral Science Solutions Ltd, 2016.
41. Samuelson P. A note on measurement of utility. The Review of Economics Studies. 1937; 4(2):155-161.
42. Strotz R. Myopia and Inconsistency in Dynamic Utility Maximization. The Review of Economic Studies. 1955; 23(3):165-180.
43. Tanaka T, Camerer C, Nguyen Q. Risk and Time Preference: Linking Experimental and Household survey Data from Vietnam. American Economic Review. 2010; 100(1):557-571.
44. Thaler R. Some empirical evidence on dynaic inconsistency. Economic Letters. 1981; 8:201-207.
45. Thaler R, Shefrin H. An Economic Theory of Self-Control. Journal of Political Economy. 1981; 89(21):392-406.
46. Tversky A, Kahneman D. Judgment Under Uncertainty: Heuristics and Biases. Science. 1974; 185:1124-1131.
47. Yang S. Effect of Poverty in Intertemporal Choice and Psychological Explanations. Psychology. 2016; 7:1296-1306. DOI: 10.4236/psych.2016.710131.