



Present-focused Behaviours and Explanatory Factors: A Novel Approach in Empirical Research

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ABSTRACT

Despite a robust literature and various practical applications, research on present-focused behaviours remain controversial and susceptible to methodological critiques. In this paper, I attempt to look at present-focused behaviours from the perspective of binary outcomes. Consequently, rather than working with the complicated measurement of present-focused preferences and the in-discord utility function with non-exponential discount factor, I review existing literature for factors which have been documented to have impacts on an agent's discount factor, hence the agent's present-focused preferences, and their present-focused behaviours. Regression results are in line with empirical literature as explanatory factors such as one's cognitive ability and one's problems of smoking, drinking, drugs could increase or decrease their probability of behaving in a present-focused manner. Despite limitations regarding measurements of explanatory factors and (perhaps) dataset, the quantitative method employed here could be further developed and adapted to other problems in the field of behavioural economics; for example, bounded-rational behaviours.

Keywords: present-focused behaviours, present-focused preferences, present bias, cognitive ability.

1. Introduction

Every decision, whether of an individual, a household, a firm, or a government, is essentially an action of choosing the best option out of a range of possibilities. In economics, this decision is referred to as an economic agent's allocation of resources to optimise. Nevertheless, choices are frequently complicated as they might involve uncertainty, or they have their consequences played out over time. Ergo, a working model of optimisation that takes factors such as time, and/or risk, into consideration.

In terms of time, the intertemporal choice model of exponential discounted utility (Ramsey, 1928; Samuelson, 1937) was widely accepted for much of the twentieth century due to its parsimony and generality. However, the model proved to be inaccurate as Strotz (1955) introduced the problem of inconsistency in dynamic utility maximisation, which pioneered several theoretical, empirical, and experimental research in the modern field of behavioural economics. Thaler (1981) elegantly delivered the essence of dynamic inconsistency with the example that some might prefer one apple today over two apples tomorrow, but none shall choose one apple in a year over two apples in a year and a day.

The idea that an economic agent is more likely in the present to choose an action that generates immediate experienced utility, than they would be if all the consequences of the actions in their choice set were delayed by the same amount of time is conceptualised as present-focused preferences. Theoretically, present-focused models are categorised by dynamic consistency of preferences and commitment (Ericson & Laibson, 2019). The former refers to whether an agent's preferences allow them to remain consistent between their action in the future and the statement of their future action in the past, while the latter refers to whether an agent commits to follow their designated plan. While Ramsey (1928) and Samuelson (1937)'s exponential discount function has the property of dynamic consistency, the fact that several empirical papers concluded that agents typically have their discount rate decreases over time (Thaler, 1981; Benzion, Rapoport & Yagil, 1989; Chapman & Elstein, 1995; Pender 1996) led to generalised hyperbolic discount function (Herrnstein, 1961; Ainslie, 1992; Loewenstein & Prelec, 1992), which inspired the dynamically inconsistent present-bias preferences, or quasi-hyperbolic discounted utility, (Laibson, 1997, O'Donoghue and Rabin, 1999a, 1999b). Other dynamically inconsistent preferences include psychometric distortions models: concave (subjective) transformation of perceived time (Read, 2001; Ebert and Prelec, 2007; Zauberman et al., 2009), subjective probability distortions (Kahneman & Tversky, 1979), ..., and myopia (Gabaix & Laibson, 2017).

Empirically, present-focused preferences provide a wide range of applications that concerns both individuals and government, such as procrastination (Ariely & Wertenbrock, 2002; DellaVigna & Malmendier, 2004, 2006; Reuben et al., 2015; Brown & Previtro, 2016; Augenblick & Rabin, 2018; Bisin & Hyndman, 2018; Fedyk, 2018), medical adherence (Thornton, 2008; Banerjee et al., 2010; Milkman et al., 2011, 2013), retirement saving (Bernheim et al., 2001; Angeletos et al., 2001; Haider and Stephens, 2007; Carroll et al., 2009; Olafsson and Pagel, 2018), ... However, despite similar predictions, present-focused models have fundamental distinctions that influence which advice to give to individuals for a more optimal behaviour, or which policy should a government develop, ... Consequently, the robust literature regarding present-focused preferences remains controversial, in discord, and without

a shared theoretical framework or a broadly accepted empirical methodology. Empirical research, especially research with new experimental paradigms, is extremely welcomed in the field.

In this paper, I attempt to contribute to existing literature and empirical evidence by performing regressions with present-focused behaviours being the dependent variable. Instead of subjecting present-focused behaviours to a certain model of preferences as in aforementioned theoretical works, I assume behaviour, whether present-focused or not, to be a product of rationality under different conditions. In other words, rather than working around a mechanism of rationality (present-focused preferences) that originates present-focused behaviours, I shall explore factors that impact the probability of a behaviour being present-focused. Regressions, in this fashion, dismiss problems with theoretical discord (e.g., which preferences, or which form of utility function, is better in explaining present-focused behaviours), intertemporal measurements (e.g., how could discount factor be accurately measured); however, results could only answer the question of which factors increase the probability of a behaviour being present-focused, but could not answer questions such as how would a certain factor affects the probability. Independent variables shall be thoroughly discussed in the next section.

2. Model & Variables

2.1. Dependent variables & Model selection

Dependent variables

Dependent variables are dummy variables with the value of 1 if the observation is present-focused and the value of 0 if the observation is not. The value of each observation is determined by the consistency between hypothetical choices of participants. The hypothetical choices are acquired and/or adapted from previous empirical works, which shall be listed below.

Table 1: Hypothetical Choices for Dependent Variables

Number	Hypothetical Choices	Source
1	Would you prefer: A. Receiving \$50 today	Adapted from Green, Fristoe & Myerson (1994)
	B. Receiving \$55 in 10 days	
2	Would you prefer: A. Receiving \$50 in 90 days	From Rubinstein (2000)
	B. Receiving \$55 in 100 days	
3	You can receive the amounts of money indicated according to one of the two following schedules: A. April 1 July 1 October 1 December 1 \$1000 \$1000 \$1000 \$1000 B. March 1 June 1 September 1 November 1 \$997 \$997 \$997 \$997	From Rubinstein (2000)
	You have to choose between: A. Receiving \$1000 on December 1 B. Receiving \$997 on November 1	
4	In 60 days, you are supposed to receive a new stereo system to replace your current one. Upon receipt of the system, you will have to pay \$960. Are you willing to delay the transaction by one day for a discount of \$2? A. Yes	From Rubinstein (2000)
	B. No	
4	Tomorrow you are supposed to receive a new stereo system to replace your current one. Upon receipt of the system, you will have to pay \$1,080. Are you ready to delay the delivery and the payment by 60 days for a discount of \$120? A. Yes	Adapted from Loewenstein & Prelec (1993)
	B. No	
4	Would you prefer: 1st weekend 2nd weekend 3rd weekend 4th weekend 5th weekend A. Fancy Eat at home Eat at home Eat at home Eat at home French B. Eat at home Eat at home Fancy Eat at home Eat at home French	Adapted from Loewenstein & Prelec (1993)
	Would you prefer: 1st weekend 2nd weekend 3rd weekend 4th weekend 5th weekend A. Fancy Eat at home Eat at home Eat at home Fancy French Vietnamese B. Eat at home Eat at home Fancy Eat at home Fancy French Vietnamese	

Would you prefer to be invited to dinner at:

A. A fancy French restaurant

B. A local Vietnamese restaurant

If you prefer the fancy French restaurant,

Would you prefer:

A. An invitation to the French restaurant on Friday in one month

B. An invitation to the French restaurant on Friday in two months

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Would you prefer:

A. An invitation to the French restaurant on Friday in one month and an invitation to the Vietnamese restaurant on Friday in two months

B. An invitation to the Vietnamese restaurant on Friday in one month and an invitation to the French restaurant on Friday in two months

Adapted from
Loewenstein & Prelec (1993)

Model selection

Since dependent variables are dummy variables, designated regression models shall be binary classification models, specifically either logit or probit regression. Additionally, I shall perform supplementary regression with a participant's total present-focused observations percentage as the dependent variable. However, results and implications of this additional regression should not be considered strict, compared to dummy dependent variable regressions.

2.2. Independent variables

In this paper, independent variables are composed of two main groups: the explanatory group and the control group.

Explanatory group

In the vast literature of the field, developed present-focused models, which were mentioned in the previous section, all attempted to explain and rationalise present-focused behaviours by replacing dynamically consistent discount function with a dynamically inconsistent one. Ergo, whichever variable represents a factor that could impact an agent's impatience must impact their probability to conduct present-focused behaviours as well. Intuitively, it could be expressed as 'whatever makes me become more impatient urges me to behave in a more present-focused manner'. There are two lines of explanatory factors documented in existing empirical research: cognitive ability (Silva & Gross, 2004; Kirby, Winston & Santiesteban, 2005; Frederick, 2005; Benjamin, Brown & Shapiro, 2006) and clinical-related factors such as smoking (Baker, Johnson & Bickel, 2003; Bickel, Odum & Madden, 1999; Kirby & Petry, 2004; Mitchell, 1999; Ohmura, Takahashi & Kitamura, 2005; Reynolds, Richards, Horn & Karraker, 2004), alcohol consumption (Vuchinich & Simpson, 1998; Petry, 2001a; Bjork, Hommer, Grant & Danube, 2004), illicit drug use (Petry, 2003; Coffey, Gudleski, Saladin & Brady, 2003; Bretteville-Jensen, 2004; Kirby & Petry, 2004), and gambling (Petry, 2001b; Dixon, Marley & Jacobs, 2003; Petry & Casarella, 1999; Alessi & Petry, 2003). However, since the latter information might be inaccurate in a self-report survey, rendering regression results spurious, I weigh my concentration solely on the former, which suggests that grade point averages and various test scores affect an agent's discount factor, hence their behaviours.

Control group

Common variables used as control variables, in general, are demographic variables: race, gender, age, income, education level and marital status. Since all participants are Vietnamese, I omit the race variable and include location since an agent's place of living might impact their behavioural pattern. Additionally, as the hypothetical choices used to derive dependent variables are considered to be well-known in economics and related disciplines, participants could have gained exposures to them in the past. I thus include the question of whether they are/were major in, or are/were working in economics, business, finance, and mathematics. Finally, as concluded in several research that risk preferences could distort time preferences (Halevy, 2008); Saito, 2011; Epper et al., 2011; Anderson & Stafford, 2009; Andreoni & Sprenger, 2012), I include a question of perceived risk-aversion to isolate the effect of time preferences on present-focused behaviours.

Table 2: Independent Variables

Group	Factor	Variable(s)
Explanatory	Cognitive ability	GPA
		Mathematical Ability
	Clinical-related	Smoking
		Drinking
		Drugs
Control	Demographic	Gender
		Age
		Income
		Education level

	Location
	Marital Status
Prior Exposure	Major
	Work
Risk Preferences	Risk

3. Data & Results

3.1. Data collection

A survey was distributed online to gather information for analysis. The questionnaire was thoroughly inspected by experts to ensure that it is in line with current theoretical and empirical literature. Additionally, prior to actual survey distribution, a small test group of 18 people was asked to conduct a trial data collection, which allows the questionnaire to be free of any confusion, or misunderstanding, to participants. Targeted participants include Vietnamese residing in all parts of Vietnam, of any gender, and must be at least in age of major (18).

The survey is designed as follows: page 1 includes space for a written consent of participants that any information provided shall be sincere, and the written consent of author to keep any information provided in strict confidentiality, page 2 includes demographic questions, page 3 and page 4 include hypothetical choices questions, page 5 includes cognitive ability factor and other control factors questions, page 6 includes clinical-related factors questions.

3.2. Descriptive Statistics

Demographic information

The author received valid answers from 128 participants in total, aged from 18 to 55, and consist of 51 (39.84%) males, 74 (57.81%) females and 3 (2.34%) identified themselves as others. Regarding educational background, while most participants, 79 (61.72%), have a college or university degree, there are 12 (9.38%) high school graduates and 37 (28.91%) with a Master's or PhD. Monthly income ranges from roughly 42.37 USD (3 participants) to 3000 USD (1 participant), right-skewed distribution. Of the 128 participants, 72 (56.25%) are currently residing in Hanoi, 25 (19.53%) in Ho Chi Minh City, and 31 (24.22%) are living in other cities in Vietnam. Additionally, 52 participants (40.63%) are currently single, 36 (28.13%) are in a relationship, 33 (25.78%) are married, only 7 (5.47%) are separated and none is widowed. Participants' marital status distribution is not unexpected. From the demographic information above, I could conclude, with confidence, that the sample should satisfy the conditions of being a random sample.

Present-focused behaviours statistics

With 128 valid responses, I have created 7 dependent variables. There are 5 dummy variables (PFB1 - PFB5) as described in section 2.1, of which, the first four variables derived from the first four hypothetical choices have 128 observations, while the fifth only has 57 observations due to the majority of participants (55.47%) prefers local Vietnamese restaurant over fancy French restaurant, which I find unexpected. Consequently, I further derived 2 additional dependent variables: number of present-focused behaviours over the first four (PFBR4, 128 observations) and number of present-focused behaviours over all five (PFBR5, 57 observations), for exploratory purpose only. The percentages of present-focused behaviours in each hypothetical choice are quite similar, ranging from 33.59% in hypothetical choice 4 to 42.19% in hypothetical choice 3. Despite present-focused behaviours not being the norm in this study, I would argue that present-focused behaviours remain appear to be quite prevalent, which explains the heavy demand for empirical literature in behavioral economics.

Regarding independent variables, there are 18 variables in total: 7 demographic control variables, 3 variables to control for exposure, 2 variables to control for risk, and 6 explanatory variables. The first group includes 2 continuous variables: Age and Income (see table 3 for statistics), and 5 dummy variables: Female (= 1 if participant is female), Rela (= 1 if participant is in a relationship) and Married (=1 if participant is married), HS (= 1 if participant is without undergraduate level education) and Grad (= 1 if participant has a Master's or PhD). The second group offers 2 dummy variables: Major (= 1 if participant majors in disciplines mentioned in section 2.2) (74 participants, 57.81%, major in such fields) and Work (= 1 if participant works in disciplines mentioned in section 2.2) (59 participants, 46.09% work in such fields), and an interactive variable Expo (= Major * Work). The third group has 2 dummy variables: RL (= 1 for risk-loving participant) and RA (= 1 for risk-avoiding participant). Most participants, 61 (47.66%), recognise themselves as risk-neutral, while 20 participants (15.63%) and 4 participants (3.12%) are risk-loving and risk-avoiding, respectively. The final group consists of 1 continuous variable GPA, and 5 dummy variables: Math1 (= 1 for participant who is not good at math) and Math2 (= 1 for participant who is good at math), Smoking, Drinking and Drugs (= 1 for participant abuses the respective substance). 53 participants (41.41%) think that their mathematical ability is fair, 44 participants (34.38%) have confidence in their mathematical ability, while 31 participants (24.22%) believe they are not good at math. And, only 18 participants (14.06%) report that they have smoking problem, 21 (16.41%) for drinking and 10 (7.81%) for drugs.

Table 3: Continuous variables statistics

Variable	Short description (if required)	Min	Max	Mean	SD	Skewness	Kurtosis
Age		18	55	27.88	6.58	1.57	5.77
Income	Log of participant income	1.63	3.48	2.72	0.32	-0.90	5.21
GPA	Scale of 4	2.2	4	3.29	0.40	-0.42	2.53

3.3. Regression results

Regression results are presented in Table 4 below.

Table 4: Regression results

Independent variable	Dependent variable						
	Logistic regression results					Linear regression results	
	PFB1	PFB2	PFB3	PFB4	PFB5	PFBR4	PFBR5
Age	-0.10**	-0.18***	-0.05	0.07	0.00	-0.01	-0.00
Income	0.26	0.56	1.23	-1.09	1.68	0.04	0.06
Female	-0.09	0.50	-0.26	-0.19	-0.02	-0.00	0.09
Rela	-0.23	-0.14	-0.01	0.48	-1.70	0.01	-0.03
Married	0.41	0.74	0.20	-0.03	-0.40	0.05	-0.02
HS	0.77	-1.45	0.72	0.84	-0.68	0.09	-0.08
Grad	0.36	1.16**	-0.61	-0.25	-1.73	0.02	-0.04
Major	0.25	0.06	-0.20	-0.25	2.74*	-0.01	0.06
Expo	-0.78	-0.88	1.46	0.43	-4.97**	0.03	-0.15
Work	0.35	0.19	-0.97	-0.52	2.55	-0.05	0.00
RL	-0.88	-1.67**	-0.33	-0.28	-1.15	-0.13	-0.15
RA	-0.84*	-0.77	-0.04	0.58	0.53	-0.05	0.00
GPA	-0.68	-1.01	-0.14	-0.71	-2.51	-0.12*	-0.077
Math1	-0.22	0.05	-0.59	0.28	-2.07	-0.03	-0.17
Math2	-0.52	-0.03	-0.33	0.71	0.43	-0.02	-0.16*
Smoking	0.97	1.63**	0.11	-0.01	-3.25*	0.11	0.10
Drinking	0.36	-0.30	0.68	0.64	3.24**	0.08	0.25**
Drugs	-0.37	2.41**	1.69*	-0.32	0.15	0.16	-0.03
_const	4.04	5.78	-1.62	2.24	3.32	0.90	0.58
Pseudo R ² / R ²	0.1044	0.1884	0.1104	0.1101	0.3668	0.1532	0.4043

*: significant at $\alpha = 0.1$
 **: significant at $\alpha = 0.05$
 ***: significant at $\alpha = 0.01$

In general, the results are in accordance with current literature; to be precise, we could not reject the hypotheses that cognitive ability and clinical-related problems (specifically smoking, drinking and drugs) have influences on present-focused behaviours. These factors affect an agent's mental discount rate (see section 2.2 for existing empirical literature), which then cause the agent to conduct present-focused behaviours (see section 2.1 for referred works on current theoretical models in the field). In the five logistic regression models, the 5th one with PFB5 as the dependent variable has a more than great pseudo R² of 0.3668 (a logistic regression is typically deemed 'good' with a pseudo R² of 0.2). However, the fact that there are merely 57 observations should be taken into consideration. The 2nd one with PFB2 as the dependent variable appears to be decent with a pseudo R² of 0.1884. The two linear regressions offer only supplementary materials for discussion, which I shall perform in the next section.

4. Discussion

As mentioned in section 2.2, I initially expected the regression results to allow the deductions of a strong (causal) relationship between a cognitive ability variable (GPA, Math1, Math2) and present-focused behaviours. However, GPA appears to be significant at $\alpha = 0.1$ in one model with the dependent variable PFBR4, and Math2 appears to be significant at $\alpha = 0.1$ in one model with the dependent variable PFBR5. Consider the former linear regression having a 'bad' R² of 0.1532, while only 57 observations available for the latter, in addition to the fact that PFBR4 comes with only 5 values (0, 0.25, 0.5, 0.75, and 1) and PFBR5 6 values (0, 0.2, 0.4, 0.6, 0.8, and 1), though I would not dismiss the variables' significance, yet I would not accept these results as robust foundations for recommendations, either. Suspecting the problem to be with limited sample sizes (despite being a random sample, compared to Silva & Gross (2004) with participants all from their introductory psychology course) of 128 observations and 57 observations, respectively, in future attempts, I would spend more resources on participants, for a better dataset. Furthermore, the measurement of mathematical ability - in this paper: asking participants to evaluate their mathematical prowess - is another issue. Since I could not use standardised (mathematics) test scores as Benjamin, Brown

& Shapiro (2006) did, I could adopt an idea similar to the “cognitive reflection” problem-solving task scores of Frederick (2005) as the improved measurement in my future endeavours.

For the clinical-related variables, I did not expect them to play important roles in this paper since the problems are self-reported, and out of 128 participants, only 18 admitted having smoking problem, 21 for drinking, and 10 for drugs. Nevertheless, as regression results suggest, participants with these issues are more vulnerable to present-focused behaviours. Out of five present-focused behaviours being investigated in this paper, at least one of the clinical-related variables is significant in three, hypothetical choices 2, 3, and 5. I find it particularly interesting that Drugs is the only significant variable that influences present-focused behaviours in hypothetical choices 3 as it is the only one with implication regarding immediate gratification. In Vietnam, people might smoke to ease their stress, and drinking is the cultural idea of socialising, leaving drugs to be the most plausible sign of one’s desire for immediate gratification.

In the 1st logistic regression, Age and RA are the only significant variables. Despite being a control variable, Age is documented in literature as a factor that could affect an agent’s discount factor (Green, Fry & Myerson, 1994; Green, Myerson, Lichtman, Rosen & Fry, 1996; Green, Myerson, Ostaszewski, 1999, Read & Read, 2004). It is not counter-intuitive to believe that people are less susceptible to acquiring utility now as they become older, should waiting provides greater utility - in this paper, 10 days of hypothetical waiting results in five extra dollars. As for the RA variable, papers mentioned in section 2.2 aside, Kahneman & Tversky (1979) argued that as the present might be perceived as risk-free, risk-avoiding agents might behave in a present-focused fashion. Nevertheless, the implication that a risk-averse agent is 0.84% less likely to perform present-focused behaviours seems to conflict with empirical work. Again, I suspect that it is due to the dataset. In the 2nd regression, Age proves to be significant again, along with Grad, RL, Smoking, and Drugs. The variable Age raises no issue; however, the idea that a person with higher education, especially graduate education, is more prone to present-focused behaviours is quite counter-intuitive! Risk-loving, on the other hand, does not defy our understanding of risk. If a person is tempted to behave in a present-focused manner since they perceive the present to be risk-free and they wish to avoid risk, then vice versa, they experience risk for a better monetary reward, and we observe no present-focused behaviour. In the 4th regression, the argument of spread (Loewenstein & Prelec, 1993) could be employed, which, consequently, explains why there exists no significant variable in this model.

5. Conclusion

In my attempt to contribute to the vast yet controversial literature of behavioural economics, in the study of present-focused behaviours, I successfully reach the conclusion that while greater cognitive ability decreases the probability of an agent’s making a present-focused choice, the presence of problems such as smoking, drinking, drugs could cause the probability to increase. While the former is in accordance with current literature and related hypotheses have been tested in this paper, a combination of measurement problems and (perhaps) dataset rendered the results weak, or not robust enough to be used for recommendations for individuals, households, or governments. Nevertheless, the idea of viewing present-focused behaviours as plausible dependent variables could be adapted and extended to several issues in the field of behavioural economics; for example, bounded-rational behaviours. I intend to expand my method in this paper to study the impact of bounded rationality on non-optimal and/ or sub-optimal behaviours in the foreseeable future. Here, I worked around the polemic and methodologically questioned measurement of present-focused preferences and discount factor by assuming them to be intermediate mechanisms between explanatory factors and the outcome of whether a behaviour is present-focused. Analogously, I could treat rationality as an intermediate mechanism between explanatory factors and the outcome of whether a behaviour is optimal. In addition, some control variables I included in this paper proved to be promising for future exploration as well.

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