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Effects of time perspective and self-control on psychological distress: A cross-sectional study in an Argentinian sample

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ABSTRACT

Time perspective (TP) is a fundamental trait of human's psychological perception of time and can affect different aspects of psychological functioning. The current study proposes that TP and self-control can be considered as predictors of Psychological Distress (PD). 328 men and women from Buenos Aires, Argentina, completed the Zimbardo Time Perspective Inventory, which assesses five dimensions of TP, the Self-Control Scale and the Psychological Distress scale. Hierarchical regression analysis showed that past negative, past positive and self-control explain 31% of variance in PD. Afterwards, a path analysis was conducted. Results showed that future, past negative, and present orientations have a direct effect on self-control. Also, PD is predicted by past negative, past positive and self-control. Finally, future, past negative, and present orientations have an indirect effect on PD through self-control. These findings support the idea that TP is related to self-control and suggest that both, TP and self-control, can be predictors of PD. These results add to the theoretical concept of TP and shed new light on the value of considering self-control as a mediator variable between TP and someone's psychological state. Theoretical and practical implications of these findings are discussed.

1. Introduction

The aim of the present study was to empirically test the influence of time perspective (TP; Zimbardo & Boyd, 1999, 2008) and self-control (Vohs & Baumeister, 2016) on psychological distress (PD; Kessler et al., 2002). We also present a theoretical model where self-control acts as a mediator in the causal relationship between TP and PD.

1.1. Time perspective

The concept of time has been a very relevant topic in psychological research. It has been studied from different theories and currently there are many instruments available to assess diverse aspects of psychological time. In particular, this work deals with the concept of TP developed by Zimbardo and Boyd (1999) who define it as "the non-conscious process, through which the flow of personal and social experiences are framed in temporal categories that help to give order, coherence and meaning to those experiences" (p. 1271).

In the last 20 years, the Zimbardo Time Perspective Inventory (ZTPI)

has been translated and adapted in more than 24 countries (e.g.: Brenlla et al., 2019; Przepiorka et al., 2016; Sircova et al., 2014). ZTPI assess five domains of TP. Firstly, past negative reflects a general negative, aversive view of the past. Secondly, past positive reflects a warm attitude towards the past. It refers to past experiences that were pleasant. Present hedonistic reflects a hedonistic, risk-taking attitude towards life and suggests an orientation towards present pleasure with little concern about future consequences. Present fatalistic is linked to current experiences generating anxiety and fear. Finally, future reflects a general future orientation associated with future goals and rewards. Individual TP is composed of one's attitudes towards each one of these dimensions (Zimbardo & Boyd, 1999, 2008).

When considering the last decades' researches on TP, many among them have proven the relationship between TP and other variables, showing that TP can be considered as a personality trait underlying different aspects of a person's life (e.g. Dany, Roussel, Laguet, Lagouanelle-Simeoni, & Apostolidis, 2016; Kim, Hong, Lee, & Hyun, 2017; Xu, Yang, & Ma, 2018). Among these studies, one of the most relevant and popular topics is the relationship between TP and different

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features of self-regulation process (e.g.: Dreves & Blackhart, 2019; Griva, Anagnostopoulos, & Potamianos, 2013; Price, Higgs, & Lee, 2017).

Within this frame, TP can be associated to different outcomes. We are particularly interested in how TP is related with various facets of psychological adaptation. Different studies have emphasized the importance of TP as a correlative or predictive variable in the analysis of: life satisfaction (Przepiorka and Sobol-Kwapinska, 2018), psychological adaptation (Marczak, Sorokowski, & Sobol-Kwapinska, 2020), subjective happiness (Drake, Duncan, Sutherland, Abernethy, & Henry, 2008), satisfaction with life (Bonniwell, Osin, Linley, & Ivanchenko, 2010) and PD (Dany et al., 2016; Walg, Eder, Martin, & Hapfelmeier, 2020).

1.2. Self-control

Self-regulation refers to the process by which people direct their thoughts, feelings, and behaviors to achieve their goals. It is composed by different aspects that need to be studied separately (Baird, Webb, Martin, & Sirois, 2017). Self-control is one of its most studied components. There are different theorizations about self-control. This study considers self-control as the ability to inhibit impulsive behaviors or reactions that can lead the person away from pursuing proposed goals (Vohs & Baumeister, 2016). This definition also includes the idea that “the exertion of self-control appears to depend on a limited resource” (Baumeister, Vohs, & Tice, 2007, p. 351).

High levels of self-control ability and future orientation have been related to positive outcomes such as being more proactive towards the consecution of goals, physical exercising, diets, study and saving (e.g.: Gellert, Ziegelmann, Lippke, & Schwarzer, 2012; Tangney, Baumeister, & Boone, 2004). On the other hand, present orientation and low levels of self-control have been related to anxiety and depression; tobacco, alcohol, and drug use; and risky driving (e.g.: Daugherty & Brase, 2010; Dwivedi & Rastogi, 2017; Vohs & Baumeister, 2016).

1.3. Psychological distress

Recently, there has been an increase in the so-called most frequent disorders - e.g.: depression, panic attacks or general anxiety - which affect people's everyday lives (Jurado et al., 2017; Wang et al., 2020). These common mental disorders are associated with the presence of significant PD and negatively affect the physical and mental health of individuals (Brenlla and Aranguren, 2010).

Across different studies PD has been studied as an indicator of mental health and mental illness. It combines depression and anxiety symptoms that can indicate a feeling of psychological ill-being (Kessler et al., 2002). Epidemiological studies and population surveys have shown that reported psychiatric patients have significantly higher levels of PD than the general population. Also, PD level can be helpful to appropriately differentiate people who have a high or low risk of suffering psychological disorders (Sampasa-Kanyinga, Zamorski, & Colman, 2018).

1.4. Present study

To the best of our knowledge, previous studies on TP, self-control and different aspects of psychological adaptation have only examined their relationship separately. Not much attention has been paid to how self-control may contribute to the linkage between TP and PD. Thus, the aim of this study was to answer the question of how TP and self-control are related to PD.

As it has already been mentioned, there are many studies exploring the relationship between TP and different outcomes that are related to self-regulatory process. This led to a specific field in psychological research in which causal relationship between TP and self-regulatory process intend to be proven (Baird et al., 2017). Framed within this approach, we now propose that both TP and self-control are causally related to PD.

TP is a non-conscious process (Zimbardo & Boyd, 1999) thus it behaves more automatically than other personality traits. On the other hand, people exert self-control when they follow rules and therefore inhibit actions, or when inhibiting immediate desires to delay gratification, which means the self exerts control over its own responses concluding that self-control is a controlled process (Muraven & Baumeister, 2000). Moreover, studies have shown that self-control or other processes involved in self-regulation can be considered as a mediator variable between TP and various outcomes that could be associated with PD (Baird et al., 2017; Fieulaine & Martinez, 2011; Kim et al., 2017; Price et al., 2017; Wills, Sandy, & Yaeger, 2001). Assuming these claims, we propose that TP is causally related to self-control, meaning that there is a lineal direction from an unconscious process to a more conscious one; also, self-control can function as a mediator variable in the relationship between TP and different psychological states, such as PD, or outcomes.

Finally, all recent research studying the causal relationship between TP and self-control was done with WEIRD samples, meaning that samples were composed by people from Western, educated, industrialized, rich, and democratic cultures. Moreover, most of the samples were collected in universities, so conclusions are drawn based on the participation in studies of young undergraduates. Currently, this topic is being debated since it is not guaranteed that the results obtained in these researches are equal across different populations and, therefore, that they are equally representative of psychological constructs in other samples (Schulz, Bahrami-Rad, Beauchamp, & Henrich, 2018). These aspects are crucial for understanding the importance of doing research in southern hemisphere countries.

2. Material and methods

2.1. Participants and procedure

Snowball sampling was used to recruit participants. The sample included 328 people, of which 65% were female and 35% were male. The mean age of the participants was 32.03 ($SD = 12.96$). All the participants live in Buenos Aires. The majority (53%) graduated from high school and 37% graduated from university. They were given a set of questionnaires that included questions regarding demographics, TP, self-control, and PD. No direct compensation was provided for participation.

2.2. Measures

2.2.1. Time perspective

A short Argentinian form of the ZPTI was used (Germano & Brenlla, 2020). The scale consists of 29 items that assess five domains of TP: present hedonistic, present fatalistic, past negative, past positive and future. Responses include a five-point Likert scale (from 1 = very untrue to 5 = very true). The Argentinian adaptation of the inventory showed acceptable reliability of each domain (from $\alpha = 0.60$ to $\alpha = 0.84$).

2.2.2. Self-control

Self-control was assessed using an Argentinian version of the Brief Self-Control Scale (Garrido et al., 2018). The scale contains 13 items ranked on a five-point scale (from 1 = not at all to 5 = very much). Low scores indicate lower levels of self-control. The local adaptation of the scale showed acceptable reliability ($\omega = 0.81$).

2.2.3. Psychological distress

To assess PD, we used the Argentinian version of the Psychological Distress Scale – K10 (Brenlla & Aranguren, 2010). Respondents are asked how much over the past month they experienced the symptoms presented in the 10 items ranked with a five-point Likert-type response format (from 1 = none of the time to 5 = all the time). The scale assesses the risk of presenting non-specific PD, such as symptoms of anxiety or

depression, during the last month. High scores indicate higher levels of PD. The Argentinian adaptation showed satisfactory evidence of reliability ($\alpha = 0.80$).

2.3. Analysis

Codification and data analysis were carried out with IBM SPSS 25 statistical program. Then, a path analysis was tested using IBM SPSS AMOS 24 software.

2.4. Ethics

The Argentinian National Council of Scientific and Technical Research (CONICET) approved this study and all participants consented to attend the study after being informed about its purpose and research procedures.

3. Results

Descriptive statistics for all variables are shown in Table 1. We considered an additional ZTPI dimension, present, which was constructed considering both present hedonistic and present fatalistic items. In most cases, except future, distributions of variables were close to normal. Correlational analyses were conducted. We used Pearson or Spearman bivariate correlations as indicated for normally or non-normally distributed data, respectively. PD was positively related to past negative, present hedonistic, present fatalistic, and present; and negatively related to past positive and self-control. It is worth noting that PD was not related significantly to future. Self-control was positively related to future and negatively related to past negative, present hedonistic, present fatalistic, and present.

3.1. Time perspective and self-control as predictors of psychological distress

A multiple hierarchical regression analysis was conducted to determine the predictor variables of PD (Table 2). The predictor variables were entered in two steps: (1) TP (ZTPI scales), (2) self-control. In the first step only variables that were significantly correlated with PD were included as independent variables in this model, hence future was excluded. The model explained 31% of variance in PD ($F_{(3,323)} = 49.23$, $p < .001$, $R^2 = 0.31$, adjusted $R^2 = 0.31$). The associations between present hedonistic, present fatalistic and PD were however not significant in this model. Results show that the higher the levels of past negative orientation and the lower the levels of past positive orientation and self-control, the higher the level of PD.

Table 1

Correlation matrix, means, standard deviations, skewness, kurtosis, and reliability coefficients of the observed variables.

Variables	1	2	3	4	5	6	7	8
1.ZTPI past positive	–							
2.ZTPI past negative	–0.061	–						
3.ZTPI present hedonistic	0.153**	0.287**	–					
4.ZTPI present fatalistic	–0.005	0.386**	0.316**	–				
5.ZTPI future	0.271**	–0.017	–0.007	–0.113*	–			
6.ZTPI present	0.109*	0.400**	0.894**	0.706**	–0.049	–		
7.Self-control	0.084	–0.304**	–0.356**	–0.196**	0.556**	–0.355**	–	
8.Psychological distress	–0.260**	0.488**	0.130*	0.193**	–0.086	0.191**	–0.312**	–
Mean	3.71	2.69	3.04	2.14	3.86	2.68	43.14	23.07
SD	0.62	0.82	0.73	0.69	0.64	0.59	7.50	7.79
Skewness	–0.665	0.245	–0.099	0.409	–0.913	0.059	–0.166	0.738
Kurtosis	0.800	–0.281	–0.201	–0.180	2.205	0.052	–0.197	0.127
Alpha	0.61	0.80	0.73	0.63	0.71	0.74	0.74	0.89

Note. ZTPI – the Zimbardo Time Perspective Inventory.

* $p < .05$.

** $p < .01$.

Table 2

The results of hierarchical multiple regression analysis for psychological distress with time perspectives and self-control as independent variables.

	<i>t</i>	β	R^2	ΔR^2	ΔF	df
Model 1			0.24	0.23	100.27**	1, 325
Past negative	10.01**	0.48				
Model 2			0.29	0.28	65.89**	2, 324
Past negative	10.05**	0.47				
Past positive	–4.93**	–0.23				
Model 3			0.31	0.307	49.23**	3, 323
Past negative	8.70**	0.42				
Past positive	–4.76**	–0.22				
Self-control	–3.40*	–0.17				
Present hedonistic	–0.399	–0.01				
Present fatalistic	–0.075	–0.004				

* $p < .05$.

** $p < .01$.

3.2. Path analysis: self-control as a mediator

A path analysis was conducted to examine a theoretical model to test the effect of future, present and past negative orientations on self-control; past negative and past positive effect on PD; self-control on PD; and, the indirect effect of future, present and past negative orientations on PD through self-control. This type of analysis was selected as it allows for direct and indirect pathways from four independent variables -ZTPI orientations- to be tested within a single model. This controls for any potential overlap between the four independent variables and indicates the independent influences from each. It also allows for measurement error for all dependent variables, making outcomes more reliable. Bootstrap sampling was performed to indicate the significance of the indirect pathway. The model was set to 2000 bootstrap samples, with a 95% confidence interval. The fit of the overall model was judged using the Chi-square test, Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA), and the Normal Fit Index (NFI). A good fit is indicated by a non-significant chi-square, a small RMSEA (<0.08), and a large GFI, AGFI and NFI (>0.9) (Stage, Carter, & Nora, 2010). Fig. 1 shows the theoretical model.

Fit for the structural model was estimated using the GLS method. The model proposed in Fig. 1 was a good fit to the data. Chi-square = 3.794 ($df = 6$, $p = .705$), GFI = 0.99, AGFI = 0.98, RMSEA = 0.00 and NFI = 0.98. For the indirect pathway between future orientation and PD, through self-control, the lower level (LL) and upper level (UL) bootstrap confidence intervals (CI) did not pass through zero (LLCI = -0.124 ; ULCI = -0.032), indicating that the indirect pathway is significant. For the indirect pathway between present orientation and PD, through self-control, confidence intervals did not pass through zero (LLCI = 0.018;

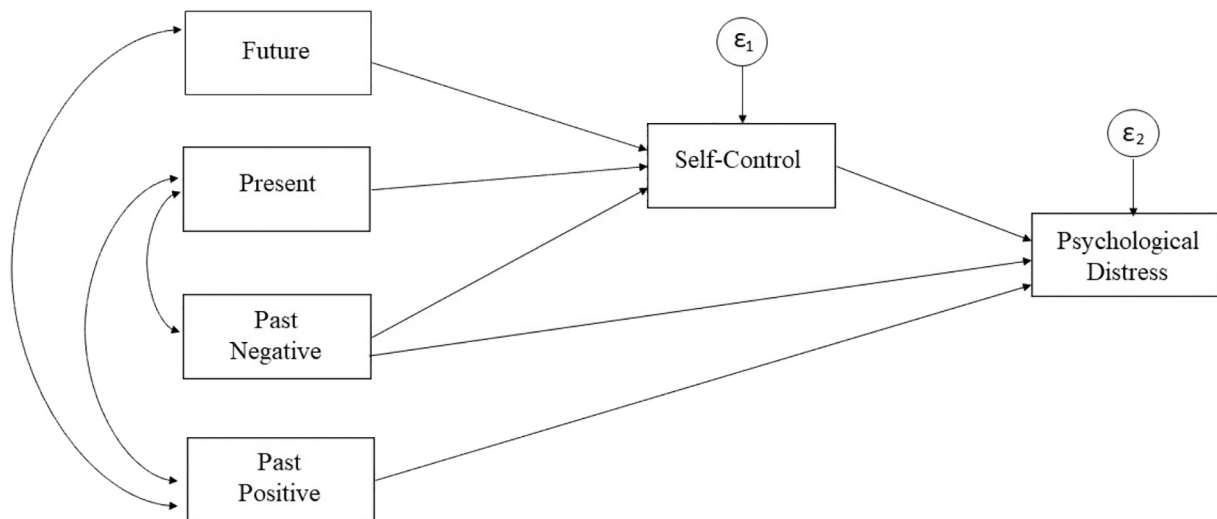


Fig. 1. Theoretical model of path analysis.

ULCI = 0.079), indicating that this indirect pathway was also significant. Finally, for the indirect pathway between past negative and PD, through self-control, confidence intervals did not pass through zero (LLCI = 0.012; ULCI = 0.068), indicating that this indirect pathway was also significant. See Fig. 2 for the significant pathways in the final model.

4. Discussion

The aim of this paper was to examine the relationship among TP, self-control and PD. Firstly, correlational analyses (Table 1) suggest there is a robust relationship between TP, self-control and PD. It is worth noting that correlation coefficients between PD and past negative, and self-control and future are very strong. Secondly, the regression analysis showed that past negative, past positive and self-control explain 31% of the variance of PD (Table 2). These results fit well with previous theories that reveal the links between TP and self-control (Baird et al., 2017; Dreves & Blackhart, 2019; Kim et al., 2017; Price et al., 2017; Xu et al., 2018) and the relationship between TP and PD (Dany et al., 2016; Walg et al., 2020).

Path analysis showed that the theoretical model had a very good adjustment, demonstrating that TP, self-control and PD are connected.

Firstly, it appears that TP leads to changes in self-control. Also, past positive and past negative orientations are predictors of PD. In addition, self-control is a predictor of PD. Finally, future, present and past negative orientations lead to changes in PD through self-control, meaning that TP has an indirect effect on PD through self-control.

When considering the values obtained in the analysis, high levels of future orientation leads to high levels of self-control. On the other hand, high levels of present and past negative orientations lead to low levels of self-control. High levels of past negative lead to high levels of PD, whereas high levels of past positive lead to low level of PD. Finally, high levels of self-control lead to low levels of PD.

It is worth noting that future was not considered for the regression analysis because it was not related to PD in the correlational analysis. Also, the regression analysis excluded present orientations. However, when considering self-control as a mediator variable, the theoretical model was significant and both future and present orientations have an indirect effect on PD through self-control. This means it is important to consider self-control when studying TP. This is crucial because self-control is a more controlled process (Baumeister et al., 2007) than TP which is defined as an unconscious process (Zimbardo & Boyd, 1999, 2008).

These results show that TP can exert effect on a psychological state

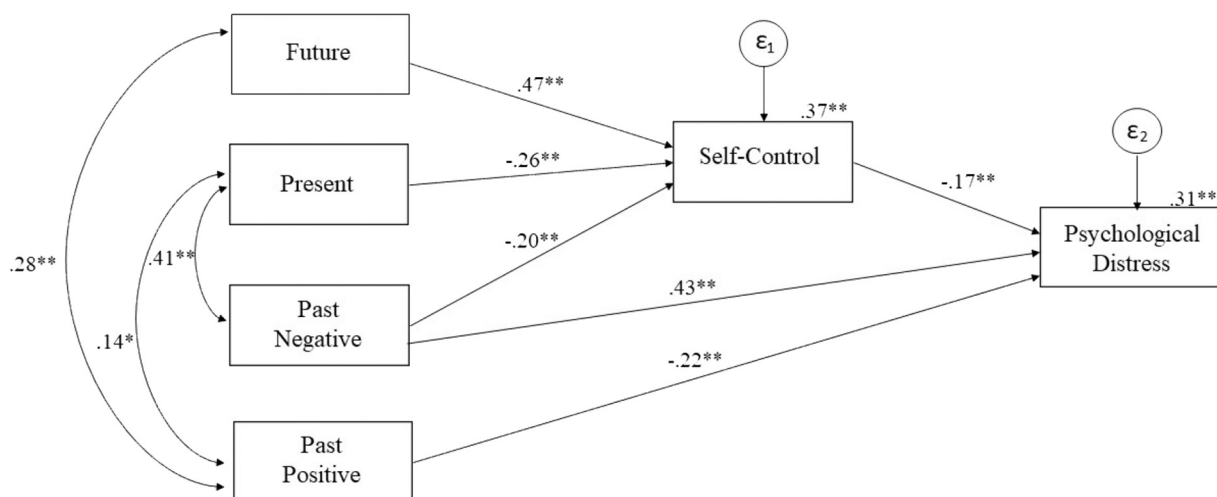


Fig. 2. Path model predicting psychological distress.

Note. * $p < .05$ ** $p < .01$.

such as PD, through self-control. This means that when considering both TP and self-control, TP is a trait which is situated previously, and when trying to study its effect on different outcomes, self-control should be considered as a mediator variable because it behaves in a more controlled manner than TP. Moreover, a recent study showed that intelligence, temperament, and family environment should be considered as origins of TP dimensions (Stolarski et al., 2020). This means that future research should also focus on primary predictors of TP, such as temperament, increasing the idea that TP is a personality trait that can be considered as a predictive variable of different features, psychological states and outcomes related to social and economic behaviors.

Considering this study among with previous ones, we can conclude that future and past positive orientations, and self-control can be considered as healthy personality traits that can be studied in relationship to positive outcomes and positive psychological states. In contrast, present along with past negative orientations can be considered as risky personality traits that can be studied in relationship to negative outcomes and negative psychological states (Dany et al., 2016; Dreves & Blackhart, 2019; Gellert et al., 2012). These conclusions should be considered when applying different interventions to improve TP profile (Sword, Sword, Brunskill, & Zimbardo, 2014) and to increase levels of self-control (Duckworth, Milkman, & Laibson, 2018) which lead to positive psychological states and positive outcomes.

Another relevant aspect is that, when considering TP, past negative orientation is a very strong predictor of PD, followed by past positive orientation. These results should be analyzed viewing the conceptualization of PD, which is related to depression and anxiety symptoms (Kessler et al., 2002). In this regard, it is logical that causal relationship between past orientations, which can be related to depressive symptoms, and PD are very strong.

In future studies, it may be possible to include another variable associated with psychological state so that these findings can be explained deeply. Moreover, it would be interesting to measure Balanced Time Perspective (BTP), which is a temporal profile that presents a combination of relatively high scores on past-positive, future and present-hedonistic and relatively low scores on past-negative and present-fatalistic scales. BTP predicts subjective well-being and is associated with optimal psychological functioning (Stolarski, 2016).

Moreover, this research was conducted in Latin America with a sample composed of people from different educational levels, not only university students, providing empirical evidence to the links between TP, self-control and PD from a more diverse sample than most of those published before in this field. This supports the idea that it is important to replicate studies across different populations with different characteristics (Schulz et al., 2018) and in this case results support what TP theory postulates (Zimbardo & Boyd, 1999, 2008).

There are some limitations in this study. Firstly, it was conducted with self-report measures. Regarding self-control, it would be interesting to include an experimental study to improve the proofs of its relationship to the other variables considered in the research. In relationship to ZTPI, it is worth noting that some factors have low reliability, especially past positive ($\alpha = 0.61$) and present fatalistic ($\alpha = 0.63$). Low reliability means there is measurement error. This turns especially relevant when considering these as the independent variables because if they are not perfectly reliable, relevant direct effects are likely biased (Kenny, 2018). Nunnally (1978, as cited in Panayides, 2013) recommends reliability levels between 0.70 and 0.80 for basic research and between 0.90 and 0.95 when important decisions are to be made based on the test score. A low value of alpha could be due to a low number of items (Schmitt, 1996 as cited in Panayides, 2013), as could happen in the current study. Future studies should revise these aspects in order to arrive to more reliable results.

Also, the sample was composed entirely of people living in Buenos Aires city. Future studies should include people living in other places of Argentina, so results can only be generalized for Buenos Aires. This is particularly important when considering that TP theory suggests there

are differences regarding geographic zones and cultural customs (Zimbardo & Boyd, 1999). Finally, regarding PD, the scale used in this study refers to the last month and its theoretical background refers to PD as a psychological state that may change (Kessler et al., 2002). It would be interesting to make a longitudinal study to prove how much TP and self-control are predictors of PD.

In sum, the current study highlights the interest to consider TP as a psychological determinant, in addition to self-control, for a better prediction of PD. This research sheds light on the practical considerations that detach from TP theory. The results serve to support the idea that TP is causally related to self-control as well as to show that TP has an indirect effect through self-control on the way that individuals psychologically feel.

CRedit authorship contribution statement

Guadalupe Germano: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft. **María E. Brenlla:** Conceptualization, Resources, Writing - review & editing, Supervision, Project administration.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2020.110512>.

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