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Cognitive Conflicts and Structure in Student Procrastination

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For Kazek, my late friend, big brother, and inspiration

”Nothing so fatiguing as the eternal hanging on of an uncompleted task”

William James

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Abstract

Procrastination is a serious and debilitating issue that correlates with a wide range of psychological, physical, relational, academic, professional, and economic problems. Many studies indicate it is especially widespread among students of which approximately 80% procrastinate to some degree, and up to 50% do it chronically. Despite more than three decades of research on this problem, little has been known so far about the role of cognitive conflicts (CCs) in its development and maintenance.

Therefore, the main objective of this dissertation was to advance the knowledge on cognitive structure and conflicts in procrastination. The theoretical framework employed for this aim was Personal Construct Theory (PCT). This constructivist approach provides concepts and methods that allow studying personality and cognitive processes in a person-centered, idiographic manner which, to the best of our knowledge, is a novel methodology in procrastination research. The present thesis focused on a specific type of CC – the implicative dilemma (ID), as well as on other variables of cognitive structure and their relationship with procrastination and clinical symptomatology.

Two interrelated studies were designed to pursue this goal. In the first, cross-sectional one, 67 students who procrastinated were compared with 61 who did not present this problem. The second, longitudinal study, explored the changes in the aforementioned variables after a brief cognitive therapeutic intervention in a sample of 28 students. Based on PCT, the Repertory Grid Technique was used to identify IDs as well as to analyze other variables of cognitive structure. Additionally, two questionnaires were employed to gauge the level of clinical symptoms. Behavioral and decisional procrastination scales were used to measure procrastination, and a set of questions were used to obtain general sociodemographic information about the participants.

Results indicated that a much larger proportion of students who procrastinated presented at least one ID in comparison to controls. The average number and intensity of IDs was higher as well in the first group. Moreover, procrastinators had larger self now – ideal self and self now – others

discrepancies, indicating that their self-concept was worse and they saw themselves as more different from others (or more socially isolated) than non-procrastinators, the latter being a novel finding. Additionally, the procrastination group suffered more from clinical symptoms, among which depression and impaired functioning stood out. Most symptoms correlated stronger with decisional than behavioral procrastination. Finally, regression analysis showed that only self now – ideal self discrepancy and ID presence were significant predictors of being a procrastinator.

Procrastination and clinical symptoms diminished largely after the brief cognitive intervention, while the presence, number, and intensity of IDs did not. However, a trend in their decrease was noted. There was no correlation between the decrease of number and intensity of IDs and the decrease of intensity of clinical symptoms. On the other hand, the participants who resolved their IDs, diminished their procrastination more than those who did not resolve these CCs. Finally, after the intervention, the self-concept of procrastinators improved and their perceived social isolation diminished.

The present research, although not free from limitations, offered the novel finding of the significance of IDs in procrastination and showed that resolving these conflicts may lead to procrastinating less. What is more, results confirmed the importance of negative self-concept and added the role of self – others discrepancy to the bigger picture of procrastinators' personality. The efficacy of cognitive therapeutic interventions for procrastination was supported as well. Lastly, clinical implications of these results were discussed and various future lines of research were suggested.

Keywords: internal conflict, implicative dilemma, self-discrepancies, repertory grid technique, personality, personal construct theory, psychotherapy, constructivism

Resumen

La procrastinación es un problema serio y debilitante que correlaciona con una amplia gama de dificultades psicológicas, físicas, relacionales, académicas, profesionales y económicas. Muchos estudios indican que está especialmente extendido entre los estudiantes de los que aproximadamente el 80% procrastina en cierto grado y hasta el 50% lo hace de una manera crónica. A pesar de las más de tres décadas de la investigación en este problema, poco se ha llegado a saber hasta ahora sobre el rol de los conflictos cognitivos (CCs) en su desarrollo y mantenimiento.

Por lo tanto, el objetivo principal de esta tesis era avanzar el conocimiento de la estructura cognitiva y sus conflictos en la procrastinación. El marco teórico empleado para este fin fue la Teoría de los Constructos Personales (TCP). Este enfoque constructivista aporta conceptos y métodos que permiten estudiar la personalidad y los procesos cognitivos de una manera orientada a la persona e ideográfica que, a nuestro saber y entender, es una metodología novedosa en la investigación de la procrastinación. La presente tesis se enfocó en un tipo concreto de CC – el dilema implicativo (DI), así como en otras variables de la estructura cognitiva y su relación con la procrastinación y sintomatología clínica.

Dos estudios interrelacionados fueron diseñados para perseguir este objetivo. En el primero, de carácter transversal, 67 estudiantes que procrastinaban fueron comparados con 61 que no presentaban este problema. El segundo estudio, longitudinal, exploró los cambios en las variables mencionadas ocurridos después de una intervención terapéutica cognitiva breve en una muestra de 28 estudiantes. La técnica de la rejilla, basada en la TCP, fue usada para identificar los DIs, así como para analizar otras variables de la estructura cognitiva. Adicionalmente, se emplearon dos cuestionarios para medir el nivel de síntomas clínicos. Escalas de procrastinación conductual y decisional fueron usadas para medir la procrastinación junto con una serie de preguntas para obtener información sociodemográfica de los participantes.

Los resultados mostraron que una proporción mucho más grande de los estudiantes que procrastinaban presentó por lo menos un DI en comparación con el grupo control. El número promedio y la intensidad de los DIs fue más alta también en el primer grupo. Además, los procrastinadores tenían mayores discrepancias yo actual – yo ideal y yo actual – otros, lo que indica que su autoconcepto era peor y que se veían más diferentes (o más aislados socialmente) que los demás en comparación con los no procrastinadores. Este segundo dato resulta ser un hallazgo novedoso. Adicionalmente, el grupo de procrastinación sufría más por los síntomas clínicos, entre los que destacaba la depresión y el funcionamiento deteriorado. La mayoría de los síntomas correlacionaban más con la procrastinación por indecisión que con la conductual. Por último, el análisis de la regresión demostró que solamente la discrepancia yo actual – yo ideal y la presencia de DIs fueron predictores significativos de ser procrastinador.

La procrastinación y los síntomas clínicos disminuyeron en gran medida después de la intervención cognitiva breve, mientras que no fue así con la presencia, número e intensidad de los DIs. Sin embargo, se notó una tendencia en su disminución. No hubo correlación entre la reducción en el número e intensidad de los DIs y la reducción de la intensidad de los síntomas clínicos. Por otro lado, los participantes que resolvieron sus DIs disminuyeron su procrastinación más que los que no resolvieron estos CCs. Finalmente, después de la intervención, el autoconcepto de los procrastinadores mejoró y su aislamiento social autopercibido disminuyó.

La investigación presente, aunque no libre de limitaciones, ofrece el hallazgo novedoso de la relevancia de los DIs en la procrastinación y sugiere que resolver estos conflictos puede llevar a procrastinar menos. Además, los resultados confirmaron la importancia del autoconcepto negativo y añadieron el papel de la discrepancia yo – otros a la perspectiva más amplia de la personalidad de los procrastinadores. La eficacia de las intervenciones terapéuticas cognitivas en la procrastinación también recibió apoyo adicional con nuestro estudio. Para concluir, se comentaron las implicaciones clínicas de estos resultados y se propusieron varias futuras líneas de investigación.

Palabras clave: conflicto interno, dilema implicativo, discrepancias del yo, técnica de la rejilla, personalidad, teoría de constructos personales, psicoterapia, constructivismo

1. Introduction

1.1. Procrastination

1.1.1. The Conceptual Framework of Procrastination

Procrastination – the habit of voluntarily postponing an intended course of action in spite of expecting to be worse off because of this delay (Steel, 2007) – is an extremely prevalent phenomenon. It is so common that probably most of us have procrastinated at some point of our lives. In fact, as much as 20 to 25% of adult Europeans, as well as North and South Americans report chronic procrastination as a part of day-to-day (Ferrari, Díaz-Morales et al., 2007; Ferrari, Driscoll et al., 2007). It is even a bigger problem among students, because up to 80-95% of college students procrastinate sometimes (Elis & Knaus, 1977; O'Brien, 2002; Schouwenburg, 2004a), and almost 50% of them do it in a consistent and problematic manner (Day et al., 2000; Onwuegbuzie, 2000; Solomon & Rothblum, 1984). Hence, if you procrastinate, you are definitely not alone. It may be comforting to know that even the brightest minds of our history struggled with this problem. William James, one of the fathers of psychology, is said to have procrastinated chronically (Richardson, 2007). The list of famous procrastinators includes as well Franz Kafka (Begley, 2008), Leonardo da Vinci, the Dalai Lama, Victor Hugo, and Bill Clinton, among others ("Procrastination and Science", n.d.).

Procrastination is so common that, despite being a big burden both at the individual and society level and causing serious problems and real suffering in areas such as professional and academic performance, finances, relationships, or mental and physical well-being (Sirois & Pychyl, 2016; Steel, 2007; Tice & Baumeister, 1997), it has become largely normalized in our culture and has been treated as a minor problem, often mistakenly related to poor time management. For many years, it had been overlooked by researchers as well. They have studied it extensively only since the mid-1980s (Ferrari et al., 1995; Lay, 1986). Although its prevalence is much higher than, for example, depression (4,4%; Kessler et al., 2005), as of today, procrastination has not been defined

as a psychological disorder by the American Psychiatric Association and thus was not included in its latest Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013). Pychyl and Flett (2012) notice that the fact of procrastination being so widespread could be a possible reason for not treating it as a serious problem. Steel (2007) notes that, in spite of the relatively recent research interest in this topic, procrastination has been viewed as an important problem for centuries. In this stance, he does not agree with Ferrari et al. (1995) who state that procrastination has been viewed negatively only since the time of the industrial revolution (circa 1750). Steel cites various historical writings, ranging from ancient Greeks (denouncing procrastination already around 800 BC, from the pen of Hesiod) to Romans (Cicero blaming Marcus Antonius for procrastination in 44 BC), to *The Baghavad Gita* – the classic spiritual text of Hinduism, written around 500 BC, in which procrastinators are said to be sent to hell. Steel concludes that "procrastination must be considered an almost archetypal human failing. Therefore, it is rather surprising and ironic that science did not address procrastination sooner" (p. 67).

The past negligence from psychology researchers has led to a situation in which still today it can be difficult to define clearly what procrastination is. The word itself comes from the Latin *procrastinare, pro* meaning "forward, forth, in favor of" and *crastinus* meaning "of tomorrow" (Klein, 1971). The definition coined by Steel (2007) and mentioned in the opening of this chapter is not the only one present in scientific literature. Lay (1986) defines procrastination as deliberately postponing what is necessary to do in order to reach a goal. In the same paper he claims that procrastination is a function of a behavioral intention-action gap – people who procrastinate fail to implement their intentions. Beswick et al. (1988) take a different stance in defining procrastination as a way of dealing with conflict and indecision. Ferrari et al. (1995) describe procrastination as a tendency to postpone starting and/or finishing activities that should be completed in a defined amount of time, this tendency generating subjective discomfort. Hence, Díaz-Morales (2019)

emphasizes that, by definition, procrastination includes two basic elements: temporal delay and subjective suffering. Van Eerde (2003) stresses that only unintended delay (stemming from poor impulse control) can be considered as procrastination which needs to be distinguished from a delay that is purposefully planned and strategic. Therefore, suggestions that procrastination can be as well active (versus passive; Chu & Choi, 2005; Habelrih & Hicks, 2015) or intentional (versus unintentional; Fernie, Bharucha, Nikčević, & Spada, 2017) seem to be discrepant from the vast majority of definitions and results of empirical research that show that the negative consequences of procrastination clearly outweigh the positive ones (Chowdhury & Pychyl, 2018; Díaz-Morales, 2019; Klingsieck, 2013). Pychyl and Flett (2012) define procrastination as a self-regulatory failure and a needless, self-defeating delay of intended actions. Along the same lines, other researchers pinpoint that procrastinators give in to feel good – a common feature of this habit is to repair or avoid negative moods at the expense of pursuing other personal objectives (Tice & Baumeister, 1997; Tice & Bratslavsky, 2000). Pychyl (2013) stresses that the pain of procrastination lies in the fact that it means wasting time which is a very limited resource. This, in turn, leads to wasting life. In his view, by doing so procrastinators become their own worst enemies and do not get on with life itself.

Ferrari (1992) proposed his own typology of procrastination, dividing it into arousal and avoidant types. Arousal procrastination, measured according to Ferrari by Lay's (1986) General Procrastination Scale, refers to postponing in order to seek thrills. Avoidant procrastination, on the other hand, occurs when people put off because of fear of failure or need to protect their self-esteem. Ferrari states that his type of procrastination is measured specifically by the Adult Inventory of Procrastination (McCown & Johnson, 1989). Later, a third – decisional – type of procrastination was incorporated within this typology, based on the Decisional Procrastination Questionnaire, developed by Mann (1982). However, both Simpson's and Pychyl's (2009) study and Steel's (2010)

meta- and factorial-analytic study disconfirms the validity of Ferrari's typology, especially when it goes to arousal and avoidant procrastination, showing that his study is impossible to replicate.

With the objective of providing a universal definition of procrastination and distinguishing between this phenomenon and functional forms of delay, Klingsieck (2013) detailed seven basic aspects of frequently cited definitions:

(a) An overt or covert act is delayed (e.g., Ferrari, 1998).

(b) The start or completion of this act is intended (e.g., Lay & Schouwenburg, 1993).

(c) The act is necessary or of personal importance (e.g., Lay, 1986).

(d) The delay is voluntary and not imposed on oneself by external matters (e.g., Milgram et al., 1998).

(e) The delay is unnecessary or irrational (e.g., Lay, 1986; Steel, 2007, 2010a).

(f) The delay is achieved despite being aware of its potential negative consequences. (e.g., Steel, 2007).

(g) The delay is accompanied by subjective discomfort (e.g., Ferrari,1998; Solomon & Rothblum, 1984) or other negative consequences (e.g., Simpson & Pychyl, 2009). (p. 25)

Klingsieck (2013) concludes that while procrastination and strategic delay share the first four characteristics, the further three of them are typical only of procrastination and not of strategic delay which is rational, planned and lacks discomfort. She adds as well (so does Díaz-Morales, 2019) that the overt act of behavioral procrastination can be distinguished from the covert one of decisional procrastination, characterized by postponing taking decisions within a certain time frame (Beswick et al., 1988; Milgram & Tenne, 2000). Klingsieck's effort results in a definition that extends the one of Steel (2007) by adding the above-mentioned aspects, as follows: "Procrastination is the voluntary delay of an intended and necessary and/or [personally] important activity, despite expecting potential negative consequences that outweigh the positive consequences of the delay" (p. 26).

Interestingly enough, while researchers strive to define procrastination and propose a unified theory that would explain it (van Eerde, 2003) and lead to developing evidence-based treatments (van Eerde & Klingsieck, 2018), popular culture seems to have taken ownership of procrastination quite successfully. The Internet is full of memes, gifs, and jokes regarding the topic. It offers as well many practical hints on how to overcome this problem. Typing the question "How to deal with procrastination?" in Google search engine gives more than 17,6 million results. The most famous public presentation on procrastination – Tim Urban's TED Talk entitled "Inside the mind of a master procrastinator" – has had so far more than 48 million views on ted.com, making it one of the most watched TED presentations of all time (TED, 2016). It has another 36 million views on YouTube being the most watched talk about procrastination on this medium. Hence, it is of no surprise that the self-help book industry is thriving when it goes to procrastination. Even most of the top researchers of this topic wrote popular science books to help the general audience in dealing with this extremely common problem (Ellis & Knaus, 1977; Ferrari, 2010; Knaus, 2002, 2010; Lay, 2015; Pychyl, 2013; Steel, 2010b).

1.1.2. The Prevalence of Procrastination

The strong presence of procrastination in popular culture is of no surprise taking into account its prevalence. As mentioned above, 20 to 25% of adults and as much as 80 to 95% of college students in Western societies procrastinate regularly, with 50% of the latter procrastinating in a chronic, problematic manner. Academic procrastination, being procrastination restricted to postponing starting or finishing tasks and activities in the realm of learning and studying (Steel & Klingsieck, 2016), is reported as one of the most common problems for students (Steel & Ferrari, 2013). They admit that this habit affects more than one third of their activities (Pychyl et al., 2000) and survey results indicate that 46% of students procrastinate on their studies at least half of the time (Balkis & Duru, 2007). When it goes to workplace procrastination, it takes away one fourth of workers' time and is estimated to bring a loss of $10,000 to $15,000 per employee every year

(D'Abate & Eddy, 2007; Steel, 2011; Nguyen et al. 2013). Research indicates as well that procrastination is becoming more and more prevalent in recent years (Kachgal et al., 2001; Steel, 2007, 2011). Steel (2007) found that while in 1978 only 5% of Americans defined themselves as chronic procrastinators, in the time of his study this number reached 26%. There is no doubt that procrastinators themselves would like to get rid of their habit – this is the wish of more than 95% of them (O'Brien, 2002).

Two cross-cultural studies indicate that chronic procrastination rates in adults from Australia, Peru, Spain, the United States, United Kingdom, and Venezuela reach between 10,9 and 16,1% (Ferrari, Díaz-Morales et al., 2007). Van Eerde (2003) states that procrastination may be seen as a bigger problem in societies driven by an individualistic, protestant-rooted work ethic oriented towards achievement, whilst it is maybe not such a serious problem for people in cultures characterized by a different rhythm of life. However, Mann et al. (1998) found that students from Japan, Taiwan, and Hong Kong had bigger problems regarding decisional procrastination and avoidant styles of decision-making than their counterparts in Australia, New Zealand, and the USA. Other cross-cultural studies show that people from countries with higher level of self-discipline procrastinate less than representatives of nations that are less self-disciplined (McCrae, 2002; Steel & Ferrari, 2013).

Let us have a look at the demographics of procrastination. As for gender differences, research results are not conclusive. Two meta-analyses (Steel, 2007; van Eerde, 2003) showed that men procrastinate slightly more than women. This was as well the result of Steel's and Ferrari's (2013) study of a global sample of 16413 English-speaking adults. Recently, Limone et al. (2020) found that men procrastinate more than women because of poor time management skills and metacognitive strategies. However, other studies found non-notable gender differences (Sirin, 2011; Zhou, 2020) or resulted in concluding that women procrastinate more than men (Rodarte-Luna & Sherry, 2008).

When it goes to age, younger people procrastinate more than the older (Díaz-Morales et al., 2008; Steel, 2007; Steel & Ferrari, 2013; van Eerde, 2003) which means that procrastination decreases with age. This finding is coherent with the fact that self-control and conscientiousness, some of the fundamental negative correlates of procrastination (Steel & Klingsieck, 2016; van Eerde, 2003), tend to increase as we mature. Procrastination seems to rise during undergraduate studies and reach its peak when people are in their mid-twenties (Schubert & Stewart, 2000). The study of Beutel et al. (2016) confirms that the group that procrastinates the most are men under thirty.

Procrastination is as well an important problem for romance (Steel, 2011) and relationships. The study conducted by Steel and Ferrari (2013) shows that procrastinators are more likely to be single and less likely to stay in a marriage. What is more, they are more likely to procrastinate both on starting a relationship, as well as on ending it. Moreover, they tend to postpone having kids and have less of them.

When it goes to the relationship of levels of education and procrastination, the research is not conclusive. On the one hand, Steel and Ferrari (2013) saw that the higher educated procrastinated less than those who did not finish high school, with the ones with the most advanced degrees procrastinating the least. On the other hand, up to one third of doctoral students do not finish their dissertations (Johnson & Conyers, 2001) and qualified professionals seem to procrastinate more than those not qualified (Díaz-Morales et al., 2006b). It is worth adding that cognitive ability is not related to procrastination (van Eerde, 2003), but procrastination can be seen as contributing to the education gap between men and women (Steel & Ferrari, 2013).

1.1.3. The Relationship of Procrastination with Health and Well-being

The negative consequences of procrastination go far beyond the waste of time and subjective discomfort imprinted in its definition. Extensive scientific evidence indicates that procrastination correlates with several mental and physical health problems and leads to decreased

well-being and poorer quality of life (Li et al., 2020; Sirois, 2015; Sirois & Pychyl, 2016; Stead et al., 2010; Tice & Baumeister, 1997).

When it goes to psychological health, procrastination is related to a series of negative states and emotions. It correlates both with shame (Fee & Tangney, 2000), guilt (Blunt & Pychyl, 2005), and negative self-evaluation (Flett et al., 2012) that stem from the social and personal condemnation of this behavior (Giguère et al., 2016). The admonition of the self leads to harsh punitive cognitions such as self-criticism, self-blame, and self-judgement which, in turn, maintain the vicious cycle of procrastination (Sirois, 2015, 2016). Burka and Yuen (1983) explain this paradox by suggesting that such judgements for procrastination are easier to bear with than doing one's best (without procrastination) and risking failure. Recent studies suggest that the incapacity to regulate negative emotions in a healthy, positive way can be crucial to understand the mechanism of procrastination (Pychyl & Sirois, 2016; Sirois & Pychyl, 2013; Tice & Bratslavsky, 2000). Problems in emotion-regulation and motivation were a focus of Wypych's et al. study (2018). They found that the strongest contributors to procrastination, accounting for 70% of its variance, were lack of value, delay discounting, and lack of perseverance, confirming the role of impulsivity and lack of motivation.

Beswick et al. (1988) found that procrastination was related to depression, anxiety, irrational beliefs, low self-esteem, indecision, and stress. These correlations were found as well in other studies (Ferrari, 1991; Lay, 1995; Solomon & Rothblum, 1984; Spada et al., 2006; Tice & Baumeister, 1997; Uzun Ozer et al., 2014; van Eerde, 2003). In her meta-analytical study van Eerde (2003) found that negative self-image, consisting of low self-esteem and a sense of low self-efficacy, was as well an important variable related to procrastination. Moreover, procrastination correlated with ruminative brooding, as well as with low levels of mindfulness and self-compassion (Flett et al., 2016).

Taking all the aforementioned correlates into account, it is no wonder that procrastinators tend to have a negative self-concept. Ferrari and Díaz-Morales (2007) indicate that procrastinators' self-concept is related mainly to issues connected to task performance and to self-presentation strategies. Such people tend to persistently justify and excuse their procrastination and look for others' approval in a "needy" way. They try to increase their social rank by making their accomplishments seem bigger than they actually are and feel vulnerable to external pressures, having little control over their own life.

Inspired by Higgins' (1987) self-discrepancy theory, various researchers analyzed procrastinators' self-concept from this perspective. Lay (1995) concluded that people who procrastinate present a higher discrepancy between their actual self and ideal self than non-procrastinators. Orellana-Damacela et al. (2000) and Ferrari, Driscoll et al. (2007), on the other hand, found a significant discrepancy between procrastinators' actual and ought selves. These studies suggest that procrastinators are not satisfied with how they are, neither when it goes to their self-concept nor to how they present themselves. What is more, procrastination was found to be related to impostor feelings and had a negative correlation with self-actualization (Flett et al., 2012). Along these lines, Tibbett and Ferrari (2019) indicate that the likelihood of identifying oneself as a procrastinator increases if the person in question is indecisive and regrets their choices regarding education, career, and finances.

Smith et al. (2017) looked deeper into the relationship between procrastination and the actual self – ideal self discrepancy. They found that, intrapersonally, the extent of the discrepancy on a given day was positively correlated to that day's procrastination level. Consequently, at the interpersonal level, those with a higher self-ideal discrepancy procrastinated more than those who felt more similar to their ideal self. What is more, perfectionistic concerns (feeling pressured by others to be perfect, doubts about oneself, or fear of making mistakes) influenced procrastination by generating a larger actual self – ideal self discrepancy.

Other affective consequences of procrastination include anger, distress, sadness, dissatisfaction, and feeling pressured or uneasy (Grunschel et al., 2013; Flett et al., 2012; Pychyl et al., 2000; Rothblum et al., 1986). Fear of failure (Haghbin et al., 2012; Solomon & Rothblum, 1984), anxiety, and depression are seen as enablers of procrastination. Moreover, shame, stress, guilt, and anxiety related to a task can provoke further procrastination in order to regulate these emotions (Giguère et al., 2016). It was demonstrated as well that students experiencing negative affect during the days before the planned task procrastinate more than those who were not in a bad mood the previous days (Pollack & Herres, 2020) – hence, we could say that negative emotions today anticipate procrastination tomorrow. It is as well important to stress that while procrastination allows for a momentary sensation of well-being in the present, it leads to a decreased level of well-being in the future or, more accurately, a decreased well-being of the future self (Sirois & Pychyl, 2013; Pychyl & Sirois, 2016). When it goes to students specifically, procrastination influences as well levels of their satisfaction in the academia (Balkis & Duru, 2015) and in life in general (Çapan, 2010). What is more, whilst the procrastinating students reported better health and higher level of well-being than their non-procrastinating colleagues at the beginning of the university term, by the end of it they had more health problems and higher level of stress (Tice & Baumeister, 1997). This was the initial study that suggested that procrastination may lead to poor health in general.

Physical health can be seriously affected by procrastination both in short and long term. Procrastinators put themselves at risk by postponing health protective actions such as medical and dental check-ups, household safety behaviors or getting a diagnosis (Sirois, 2007, 2016; Sirois et al., 2003; Yaniv, 2002). More often than non-procrastinators they report as well such acute health problems as digestive issues, headaches, colds, and flus (Sirois et al., 2003). Moreover, procrastination is a vulnerability factor for bad adjustment and management of hypertension and cardiovascular disease (Sirois, 2015).

Sleep is another area affected by procrastination. Bedtime procrastination is understood by Kroese et al. (2014) as failing to go to bed at the intended time, in a lack of any external circumstances that would prevent a person from doing so. This behavior leads to greater social jetlag, insufficient sleep and its worse quality (Kroese et al., 2014; Li et al., 2020) which, in turn, provokes fatigue and more procrastination the following day (Kadzikowska-Wrzosek, 2018; Kühnel et al., 2016; Kühnel et al., 2018; van Eerde & Venus, 2018). This is coherent with the suggestion of Baumeister et al. (2000) who stated that sleep is essential to recover depleted self-regulatory resources. Chronic sleep insufficiency can lead to many other health problems, such as hypertension, obesity, diabetes, depression, higher levels of the stress hormone cortisol or immunodeficiency (Kroese et al., 2016).

Sirois (2007) and Sirois and colleagues (2003) explained the relation of procrastination with poor health-related outcomes by proposing the procrastination-health model. The authors state that procrastination may contribute to bad health through two routes. The direct one is stress-related, whereas the indirect one is related to behaviors such as avoiding health-promoting and health-maintenance efforts, viewed as challenging or aversive. When it goes to the direct route, the stress that results from procrastination contributes to psychophysiological changes such as stress response and activation of the sympathetic nervous system (involved in the *fight or flight response*) and the hypothalamic pituitary adrenal (HPA) system that suppresses the immune system. All that may have a negative effect on health and make the procrastinator more vulnerable for diseases. Stress (especially when it is chronic) contributes largely to development and exacerbation of many serious and chronic conditions (diabetes, cardiovascular disease, or arthritis, among others) by its impact on the immune system and dysregulation of inflammatory processes in the body (Cohen et al., 2012; Maté, 2011).

Finally, procrastination can affect financial well-being as well. Procrastinators are more likely to have a credit card debt and the amount of it in their case is higher than for non-

procrastinators (Meier & Sprenger, 2010; Nye & Hillyard, 2013). They procrastinate as well on filing their taxes which leads to mistakes and overpayments (Kasper, 2004; Martinez et al., 2017) and they postpone planning for retirement – starting to save for it later, not engaging in saving plans, and being less likely to save a defined amount of money regularly (Brown & Previtero, 2014). Steel (2011) states that procrastination can be linked also to the debt at the national level. Gamst-Klaussen et al. (2019) showed that the relationship between procrastination and financial behavior is completely mediated through financial self-efficacy which is of no surprise, as self-efficacy is one of the factors associated to procrastination (Steel, 2007). Moreover, unemployed procrastinators can sabotage themselves by postponing job search (Lay & Brokenshire, 1997).

1.1.4. Understanding Procrastination – Explanatory Models

Trying to understand the origin and function of procrastination can be a difficult task. This difficulty is caused by the richness of different perspectives and the vast number of overlapping, although sometimes contradictory, theories and typologies for analyzing and defining this problem together with its roots and functions (Díaz-Morales, 2019; Ecker et al., 2012; Klingsieck, 2013; Steel & Klingsieck, 2016). Therefore, it is understandable that researchers have not yet reached an agreement when it goes to a unified theory of procrastination, and a more comprehensive framework is still needed (van Eerde, 2003). However, some promising efforts have been made in the recent years so as to propose an integrative theory that would encompass various perspectives and the most valid research results (Fernie, Bharucha et al., 2017; Sirois & Pychyl, 2013; Steel & König, 2006). In order to present the existing theories of procrastination in a transparent and up-to-date way, we follow Klingsieck's (2013) division of perspectives, adding to it other theoretical positions that have been developed in the last decade.

1.1.4.1. The Differential Psychology Perspective. From the perspective of the psychology of individual differences, procrastination is a trait (Ferrari et al., 1995; Klingsieck, 2013; Lay & Schouwenburg, 1993; Milgram et al., 1988; Steel, 2007) and is studied mostly regarding its relation

to other personality traits and similar variables. Both van Eerde's (2003) and Steel's (2007) meta-analyses confirm that procrastination has sufficient stability across time and situations in order to be considered a trait. Moreover, it seems that there is a biological or genetic factor related to procrastination, as showed in Arvey's et al. (2003) study on identical and fraternal twins.

When it goes to the Big Five Model of Personality (Costa & McCrae, 1985, 2008), conscientiousness and all its facets have a strong, negative correlation with procrastination (Steel, 2007; van Eerde, 2003; Watson, 2003). This led Shouwenburg (2004b) to suggest that there is no reason to separate the two traits – procrastination and conscientiousness. His proposal was supported by the following fact:

> Various studies show a very distinct clustering of related traits: trait procrastination, weak impulse control, lack of persistence, lack of work discipline, lack of time management skill, and the inability to work methodically. In this constellation, there seems little justification for viewing procrastination as a separate trait. It is possibly more fruitful to label this cluster as (lack of) self-control. (p. 8)

However, Steel (2007) points out that, in spite of this significant overlap, conscientiousness is a broader concept which means that procrastination could be considered as a central facet of this personality trait but is not conscientiousness itself.

Steel's and Klingsieck's (2016) study shows that, out of all facets of conscientiousness, it is self-discipline that correlates the strongest with procrastination. In total, conscientiousness and its facets accounted for 61% of the variance, standing at the core of procrastination. Moreover, when conscientiousness was controlled for, the other personality traits had no connection to procrastination. Steel and Klingsieck conclude that while those other traits are not causal for procrastination, they do influence the way in which this trait manifests. In this statement the authors coincide with Shouwenburg (2004b).

Similarly to Shouwenburg's (2004b) finding, Steel and Klingsieck (2016) found that the phenomenological experience of why one procrastinates and what activities are chosen while doing it are best explained by neuroticism and extraversion. People high in neuroticism procrastinate because of anxiety and those who are low in this trait report not being concerned or worried enough about the task. On the other hand, people high in extraversion postpone their tasks because of social reasons and those high in introversion report searching for solitude or lacking energy. The most typical personality profile of a procrastinator in Steel's and Klingsieck's study was a person that is high both in extraversion and in openness for experience – together such cases accounted for 70% of the cases in the study.

Van Eerde's (2003) meta-analysis confirms that conscientiousness has the highest correlation with procrastination with the average effect size being $r = –0.63$. Neuroticism and procrastination showed a moderate correlation ($r = 0.26$)., similarly to trait anxiety ($r = 0.24$). This moderate relation of neuroticism to procrastination was confirmed by Steel (2007) who nevertheless argues that in reality this relationship is even weaker as those who are more anxious and think less of themselves judge their behaviors harsher, but they are not necessarily worse at their performance. Interestingly, both Steel (2007) and others (Schouwenburg & Lay, 1995; Johnson & Bloom, 1995) indicate that the connection of neuroticism and procrastination is created mostly due to impulsiveness (a facet of conscientiousness), not by anxiety. Hence, for these authors, neuroticism seems to be rather unrelated to procrastination.

When it goes to other traits and trait-like variables, van Eerde (2003) found in her meta-analysis that the largest average correlations, apart from conscientiousness, were found with self-discipline (negative) and self-handicapping (procrastination might be even considered as one of the ways of self-handicapping). Other studies showed that procrastination is related to pessimism (Jackson, Weiss, & Lundquist, 2000), psychological rigidity (Glick et al., 2014; Hailikari et al., 2021; Sutcliffe et al., 2018), increased perfectionism (Pychyl & Flett, 2012), low self-esteem

(Ferrari, 1994, 2000; Ferrari & Díaz-Morales, 2007), and various identity aspects (e.g., self-concept and self-presentation; Ferrari, Driscoll et al., 2007).

1.1.4.2. The Motivational and Volitional Psychology Perspective. The stance of motivational and volitional psychology regarding procrastination is that it occurs due to a failure in people's motivation and/or volition and such failure results in the aforementioned intention-action gap (Lay, 1986; Steel, 2007). With regard to motivation, those who procrastinate tend to fail to regulate their motivation in general (Grund & Fries, 2018; Grunschel et al., 2016). More specifically, they are usually not self-determined (Grund & Fries, 2018; Senécal et al., 2003), not intrinsically motivated (Brownlow & Reasinger, 2000), and are not able to induce flow states (Seo, 2001). Value orientation is an important factor as well – Grund and Fries (2018) showed that people low in achievement orientation and high in well-being orientation tend to procrastinate more. Some motivational factors that help avoid procrastination are high self-efficacy (van Eerde, 2003; Wäschle et al., 2014), a mastery approach towards objectives (e.g., Howell & Buro, 2008), and internal locus of control (Brownlow & Reasinger, 2000).

When it goes to volition, procrastinators present a lower level of organization and of using cognitive and meta-cognitive learning strategies (e.g., Howell & Watson, 2007). Moreover, they have poor planning skills (Rabin et al., 2001) and when they work on a task, they are not perseverant, distracting themselves easily (Dewitte & Shouwenburg, 2002). Other studies confirm these findings by showing that procrastinators have poor self-regulation (e.g., Dietz et al., 2007) and decreased action-control (Blunt & Pychyl, 2005). Nonetheless, Grund and Fries (2018) argue that motivational aspects of procrastination precede the volitional ones. Therefore, they state that therapeutic interventions should be focused on the former ones rather than the latter.

Temporal orientation and time-related variables have also been the focus of studies on procrastination. As we mentioned before, the question of time is central in understanding procrastination – people put off despite knowing they will be worse off because of the delay.

Temporal perspective, understood as the capacity of thinking about past, present, and future and associated with variables such as well-being, optimism, sense of control, achievement motivation or self-directiveness (Díaz-Morales, 2019; Zaleski, 1996), is yet another of the many Achilles' heels of procrastinators. Procrastinators are rather impulsive, so time is a sensitive question for them. They have difficulties in time management, understood as setting goals and priorities, use of time-related mechanisms, and perceived time control (Lay & Schouwenburg, 1993). They are focused on the present rather than future and search for instant gratification, thus avoiding the anxiety-provoking planning for future goals (Díaz-Morales, 2019; Ferrari et al., 1995; Steel, 2007; Steel & Klingsieck, 2016). Hence, procrastinators have a high present and low future orientation (Specter & Ferrari, 2000). What is more, Jackson et al. (2003) found that academic procrastination correlates with a low future orientation and a high orientation on a negative past and fatalistic present. Díaz-Morales and colleagues (2008) found that procrastinators' present orientation was either fatalistic or hedonistic and they had a lower future orientation than people who do not procrastinate.

The motivational and volitional perspective bore fruits in the form of concrete theories of procrastination. Arguably, the most prominent of them is the Temporal Motivation Theory (TMT) created by Steel and König (2006; cf. Gröpel & Steel, 2008). This meta-theory integrates expectancy theory and hyperbolic time discounting (Howell et al., 2006) with need theory and prospect theory (Hodgkinson & Healey, 2008). TMT incorporates core validated constructs from these theories: expectancy (e.g., self-efficacy), value (e.g., task aversiveness) and time sensitivity (e.g., impulsiveness). Expressed mathematically, motivation according to TMT is a result of the equation (1) presented below.

$$Motivation = \frac{Expectancy \times Value}{1 + Impulsiveness \times Delay} \quad (1)$$

According to TMT, motivation increases when the expectancy of an outcome (e.g., one's achievement motivation and confidence in achieving the outcome) and its size or value are bigger. On the other hand, the time discounting element suggests that motivation decreases when the delay before the outcome and one's impulsivity increase (Steel & König, 2006). In other words, motivation is low when there is a lot of time left until a deadline, whereas it increases hyperbolically as this time shrinks. Hence, procrastination occurs because of preference reversal. In short, it is more likely to occur when the outcome of a presently aversive task promises rewards (even big ones) in distant future (Steel & Klingsieck, 2016). Gustavson and colleagues (2014) used TMT in a twin study that showed that procrastination and impulsiveness are inseparable at a genotypic level. Therefore, they suggest that TMT can be well integrated with evolutionary psychobiology and neurobiology accounts of motivation. Steel et al. (2018) used TMT to examine procrastination across multiple goal stages and demonstrated that people's pacing style depends on self-reported procrastination. They showed as well that procrastination influences intention-action gaps, but not mere intentions. In other words, procrastinators dearly want to perform the task, but fail at transferring their intentions into actions (Steel et al., 2001). What is more, procrastinators are susceptible to the proximity of the temptation and to the separation of the intention and the planned action – the bigger the separation, the greater the intention-action gap. Interestingly, this longitudinal study found that the most important self-regulatory skills that explain procrastination are attention-control, energy regulation and automaticity – they accounted for 74% of the variance (Steel et al., 2018).

Among other theories stemming from the realm of motivational and volitional psychology we find the Self-Determination Theory (Senécal et al., 2003). This model states that non self-determined motivations towards school and interpersonal relationships correlate with a conflict between these two areas of life and, as a result, this role conflict correlates with procrastination.

Action Control Theory (Blunt & Pychyl, 2005) is a model that explores the differences

between people who are state-oriented versus action-oriented regarding their Personal Project Systems (Little, 1983). Blunt and Pychyl found that state-oriented individuals have their project system higher in such appraisal dimensions as procrastination, uncertainty, guilt, frustration, and boredom. Moreover, they are lower in absorption, outcome, control, progress, and self-identity (understood as the extent to which a task or project is felt congruent with people's vision of themselves). These findings are coherent with Pychyl's further work and his focus on procrastination as a self-regulatory failure. Sirois and Pychyl (2013) state that procrastinators need to put off in order to regulate their emotions and as this need becomes the priority, the self-regulation necessary for achieving a goal is bound to fail. Hence, task avoidance is used to downregulate the negative emotions caused by an aversive task – the more aversive the task, the higher the possibility of engaging in procrastination to avoid the negative emotions associated with the task. In other words, short-term emotion regulation becomes more important than achieving a long-term goal (Blunt & Pychyl, 2000; Sirois & Pychyl, 2013).

Another model developed in the discussed area is the Metacognitive Model of Procrastination (Fernie, Bharucha, Nikčević et al., 2017; Fernie et al., 2018) grounded in Self-Regulatory Executive Function Model (S-REF Model, Wells & Matthews, 1996). In fact, Fernie, Bharucha, Nikčević et al. (2017) question TMT for focusing mainly on cognitions' content while neglecting cognitive processes and attentional strategies. Their Metacognitive Model not only takes care of this area but gives central attention to metacognitions understood as "higher order thinking that embodies beliefs concerning cognitive processes, attentional strategies, behaviors, and physical sensations" (Fernie, Bharucha, Nikčević et al., 2017, p. 197). Defending their distinction between intentional and unintentional procrastination (Fernie, Bharucha, Nikčević, & Spada, 2017), the authors indicate that actually their model does not propose creating a typology of two separate behaviors, a categorical difference between procrastinators. Instead, in the study that tested their Metacognitive Model (Fernie, Bharucha, Nikčević et al., 2017) they found that intentional

procrastination leads to the unintentional one through certain Cognitive Attentional Syndrome configurations, negative metacognitions about procrastination, and low mood.

The most recent model to date is the one created by Zhang, Liu, and Feng (2019; Zhang & Feng, 2020). They indicate that both the TMT and the emotion-regulation perspective present some important drawbacks. Specifically, TMT does not consider task aversiveness and its influence on procrastination, whereas, while the emotion-regulation perspective does consider task aversiveness, it does not do so with time discounting. That is why Zhang et al. propose their own, more comprehensive and inclusive model, called the Temporal Decision Model. According to these authors, engaging in an action or not doing so at a concrete point depends on the comparison of two types of motivations: the one to act (stemming from the delayed incentives yielded by the task) versus the one to avoid acting (stemming from task aversiveness). When it goes to the specifics of this conflict and its results, the authors explain them in the following manner:

> the temporal decision model suggests that the motivation to avoid (...) can be discounted by time delay when individuals voluntarily postpone the task; whereas the motivation to act (…) can be discounted less when putting off the task to a deadline. Importantly, putting off a task actually increases time distance between the agent and task aversiveness but moves the task towards the deadline, and thus modulates the motivation to avoid and the motivation to act asymmetrically, resulting in the decision not to act now but to act in the future (i.e., procrastination). (p. 14)

The authors of the Temporal Decision Model state that this way of viewing procrastination provides interesting possibilities for formulating novel hypotheses and performing research (Zhang, Liu, & Feng, 2019). When Zhang and Feng (2020) tested their model, they found indeed that people will procrastinate as long as they perceive that task aversiveness is stronger than the utility of the potential outcome and they would stop procrastinating when both forces become comparable.

1.1.4.3. The Clinical Psychology Perspective. Understanding procrastination from a clinical formulation point of view and thus designing therapeutic interventions would diminish or erase the grip that this problem holds on procrastinators. Clinical attempts to understand and treat procrastination draw on a variety of approaches: psychoanalysis, cognitive behavioral therapy, behaviorism, neuropsychology (Ferrari et al., 1995; Schouwenburg, 2004a), constructivism (Ecker & Hulley, 1996, 2019; Neimeyer, 2010), as well as psychodynamic (Haghbin & Pychyl, 2007), developmental (Yip & Leung, 2016; Zakeri et al., 2013), and strategic (Lopez & Wambach, 1982; Shoham-Salomon et al., 1989; Wright & Strong, 1982) approaches. In the light of the fact that procrastination is not defined as a psychological disorder by diagnosis and treatment manuals such as DSM-5, Engberding et al. (2011) proposed their own criteria that would define if procrastination is clinically relevant or not. These authors suggest that procrastination can be seen as a disorder if it persists for longer than 6 months, is perceived as a problem for more than half the day, and the person has at least five physical or psychological complaints regarding this problem.

The clinical perspective focuses on the negative correlates and consequences of procrastination as well as on the possible underlying beliefs or emotional constructions driving this habit (Ecker & Hulley, 1996; Ferrari et al., 1995; Schouwenburg, 2004a). Clinical research and psychotherapy case studies relate procrastination to depression (Flett et al., 1995; Hernández et al., 2019; Uzun Ozer et al., 2014), conflictual and negative attachment styles (Haghbin & Pychyl, 2007), formally diagnosed ADHD (Ferrari & Sanders, 2006; Niermann & Scheres, 2014), (test) anxiety (Flett et al., 1995; Spada et al., 2006), maladaptive perfectionism (Rice et al., 2011; Sederlund et al., 2020), intrinsic beliefs such as fear of failure and rejection (Ecker et al., 2012; Haghbin & Pychyl, 2007; Haghbin et al. 2012), strict and supervision-based parenting styles of procrastinators' caregivers (Zakeri et al., 2013), and stress together with stressors (Flett et al., 1995; Jackson et al., 2000). Other studies indicate that procrastination could be a way of rebelling oneself against authority (Solomon & Rothblum, 1984) or a form of revenge (Ferrari & Emmons, 1994).

Additionally, obsessive-compulsive personality disorder has been associated with procrastination as well (Ferrari et al., 1995; Chapter 8).

1.1.4.4. The Situational Perspective. The situational perspective focuses less on the person that procrastinates. Instead, its center of attention is directed towards the situation and context that supposedly trigger procrastination. Researchers have focused on situational features such as specific task characteristics, for example its difficulty, plausibility, attractiveness, importance, future incentives together with temporal proximity of these incentives, and person's background knowledge (e.g., Ackerman & Gross, 2005; Blunt & Pychyl, 2000; Dewitte & Schouwenburg, 2002; Grunschel et al., 2013; Klingsieck et al., 2013; Milgram et al., 1992; Solomon & Rothblum, 1984; Schraw et al., 2007). In accordance with the aforementioned theories of procrastination, the more aversive the task (Ackerman & Gross, 2005) and the further in the future located the incentives (Dewitte & Schouwenburg, 2002), the higher the possibility to procrastinate. Factors related to work characteristics include time pressure, (Prem et al., 2018), workload demands, self-control demands, autonomy, supervisory control, and support (van Eerde, 2016). Teacher's characteristics have been studied as well. These include presenting clear expectations at the beginning of the course, well-organized materials, tests, and graded tasks (Grunschel, Patrzek, & Fries, 2013; Klingsieck, Grund, Schmid, & Fries, 2013; Schraw et al., 2007). Van Eerde (2016) suggests that the role of supervisors and colleagues should be studied as well. So far, it has been researched only scarcely regarding colleague dyads (van Eerde & Sirois, 2015). Interestingly, individuals who favor postmodern, liberal values are more likely to explain their procrastination by referring to situational aspects, whereas those who are rather conservative and prefer modern values tend to see their procrastination as personal failure, thus preferring dispositional explanations (Grund & Fries, 2018).

An interesting approach within the situational perspective is to view procrastination from a norm-based approach, offered by Giguère et al. (2016) and Rahimi et al. (2016). Giguère and

colleagues focused on the experience of shame and guilt felt by procrastinators (Blunt & Pychyl, 2005; Fee & Tangney, 2000), parting from the assumption that procrastination is a self-regulatory failure that leads to transgression of socially defined norms. This means that procrastinators are likely to feel that they are intrinsically bad – an attribution resulting in shame. Guilt, on the other hand, appears when the person becomes aware that their specific behavior resulted in transgressing social norms and resulting expectations (Giguère et al., 2016). Their research confirmed that procrastinators experience both shame and guilt, and, additionally, are afraid of other people's negative evaluation of their behavior.

The other recent study regarding procrastination and social norms (Rahimi et al. 2016) focused on the relationship between procrastination, other forms of delay (strategically reasoned or external to person's control), blameworthiness, and moral responsibility. The researchers found that after achieving a negative outcome, more moral responsibility was put on those who procrastinated than on those who engaged in delay. When it goes to a positive outcome, procrastination was assigned with less moral responsibility than delay. Moreover, participants rated other participants more responsible than themselves when procrastination resulted in failure and rated themselves more responsible when the performance was not impaired by procrastination (Rahimi et al. 2016).

1.1.4.5. Neural and Genetic Substrates of Procrastination. Over the last years, some promising research has been done in order to understand and explain the genetic and neural signature of procrastination. Until recently, research in this area was rather scarce. We knew (as mentioned before) that impulsiveness accounted for 100% of procrastination's genotypic variance (Gustavson et al., 2014) and that approximately 22% of the variance of procrastination was associated with genetic factors (Arvery et al., 2003). Moreover, Rabin and colleagues (2011) found that all domains of an important self-regulatory process which is executive functioning (initiation, plan, organization of materials, inhibition, working memory, and task monitoring) significantly predicted academic procrastination, in addition to higher age and lower conscientiousness. Finally,

Díaz-Morales and colleagues (2008) studied the relationship of circadian rhythms and procrastination, finding that avoidant procrastination was associated with eveningness.

Recently, a few research teams have made big progress in defining the neural roots of procrastination. Zhang, Liu, and Feng (2019) state that the emotional aversiveness found in procrastination can be related to the activity of the parahippocampal cortex, more specifically the pahippocampal gyrus which seems to be one of the most solid neural underpinnings of procrastination (Zhang et al., 2016). This part of the limbic system encodes the memory traces related to the past aversiveness of a given task and communicates with other brain regions of the limbic system, this way enhancing the perceived aversiveness of the task. In those who do not procrastinate, the brain sends fewer signals regarding such an aversive reaction. On the other hand, Zhang, Becker et al. (2019) found that the hippocampus is involved in representing future rewarding outcome. Specifically, procrastination is more possible to occur when people are less able to associate the tasks with highly valued incentives. These functions do not exclude each other, according to Zhang, Liu, and Feng (2019). Their review suggests that the parahippocampal cortex may be involved in organizing different parts of a task.

In the same review the authors suggest that ventromedial prefrontal cortex (vmPFC) and dorsolateral prefrontal cortex (dlPFC) which serve in emotion regulation processes, may diminish procrastination through their role in suppressing negative emotions and reappraisal of negative stimuli (Zhang, Liu, & Feng, 2019). They base their hypothesis on the fact that structural abnormalities and spontaneous metabolism in the vmPFC, dlPFC, and other brain regions involved in working memory correlate with trait procrastination (Hu et al., 2018; Liu & Feng, 2017; Zhang et al., 2016). What is more, the dlPFC is a region that is shared by procrastination and impulsivity and it accounts for their relation (Liu & Feng, 2017). In another study, Liu and Feng (2019) found as well that the parahippocampal gyrus and the ventromedial prefrontal cortex (critical regarding

episodic future thinking) could be responsible for the impact of the future time perspective on procrastination.

Another neuroscientific research team (Schlüter et al., 2018) identified anatomical differences in the brain when it goes to action control, an ability closely related to procrastination. The researchers found a relation between difficulties in initiating decision-related action (AOD, the acronym stemming from decision-related action orientation) and both gray matter volume of the amygdala, as well as its connectivity to other control-related areas of the brain. It came out that the amygdala volume of procrastinators is higher than of those who do not have this problem. This finding is coherent with the research of Blunt and Pychyl's (1998) who researched the relationship of decision-related action and procrastination. They stated that people with larger amygdalae "have learned from past mistakes and evaluate future actions and their possible consequences more extensively. This, in turn, might lead to greater concern and hesitation, as observed in individuals with low AOD scores" (Blunt & Pychyl, 1998). What is more, Schlüter et al. (2018) found that the stronger functional connectivity between the amygdala and the dorsal anterior cingulate cortex, the higher the scores in the decision-related action orientation which would lead to less procrastination. In another study, Schlüter et al. (2019) found that a specific gene (*TH*), involved in the dopaminergic system, leads to lower scores in AOD, though only in women. This would suggest that sex can be a modulating factor in procrastination.

Finally, Wypych and colleagues (2019) investigated neural mechanisms involved in the pressure of punishment related to procrastination. The results of their study suggest an impairment when it goes to error processing mechanisms (and thus difficulties in error correction) in procrastinators. This may occur, as the researchers conclude, firstly, due to lower error-related activity in anterior cingulate cortex of procrastinators and, secondly, due to a lower level of interaction between the anterior cingulate cortex and the right dorsolateral prefrontal cortex in punishment condition. Therefore, Wypych and colleagues state that procrastinators have problems

in increasing self-control in demanding scenarios and/or difficulty in coping with negative situations (Wypych et al., 2019).

1.1.5. Measures of Procrastination

In the past four decades, many valid measures of procrastination were developed. Most of them are self-report questionnaires that measure postponing actions and/or decision from a perspective of individual differences. The self-report way of assessment is a certain limitation in measuring procrastination. However, some attempts have been made to measure procrastination in quasi-experimental real-life situations in which some of the scales were validated (Ferrari et al., 1995).

Most of the scales assess behavioral procrastination – the one that regards postponing actions. This is the case, among others, of two out of the three scales used in our studies: General Procrastination Scale (GPS; Lay, 1986) and Adult Inventory of Procrastination (AIP; McCown & Johnson, 1989). The third scale we used, Decisional Procrastination Scale (DPS; Mann, 1982) is an example of a scale that measures procrastination in the realm of making decisions and acting upon them. These three scales have been used widely in the study of procrastination all over the world (Díaz-Morales, 2019) and proved to be feasible and reliable after being translated and adapted into Spanish, showing satisfactory internal consistencies (Díaz-Morales et al., 2006a). For all these reasons we decided to use these questionnaires in our studies. We describe them below.

1.1.5.1. General Procrastination Scale. The GPS (Lay, 1986) is a self-administered questionnaire consisting of 20 items and assessing frequency and intensity of global procrastinatory behavior across various tasks. The answers are organized on a five-point Likert scale where 1 stands for “extremely uncharacteristic”, 3 for “neutral” and 5 for “extremely characteristic”. The answers are summed up (some items are counted reversely), with the maximum possible score being 100 points. We used this questionnaire to define the cut-off score that would determine if someone procrastinated or not in a problematic manner. As we mentioned above, this score was set at 51

points as this was the mean score for the Spanish population (*SD* = 11) in the adaptation study by Díaz-Morales and colleagues (2006b). They reported satisfactory internal consistencies (Cronbach's α = .84). Various studies (Díaz-Morales et al., 2006a, Ferrari, 1992; Ferrari et al., 2005) concluded that most items load on one factor referred by Ferrari (1992) as sensation seeking factor.

1.1.5.2. Adult Inventory of Procrastination. The AIP (McCown & Johnson, 1989) is a self-administered inventory composed of 15 items, scored on a 5-point Likert scale, from 1, standing for "strongly disagree", to 5, standing for "strongly agree". According to Ferrari (1991), the AIP measures procrastination motivated by fear of failure or success, avoidance of exposure of skill inabilities, or performance insecurity. Hence, the AIP assesses avoidance procrastination. The maximum possible score is 75. Scores of procrastination severity are obtained by summing up all the responses (seven items with reversed scores). High scores indicate a high-level procrastination. With the Spanish population a mean score of 34 (*SD* = 9) was reported by Díaz-Morales et al. (2006b). The AIP has proven to have good psychometric qualities (Ferrari et al., 1995). In the factorial analysis of AIP's Spanish version (used by us in this research) two factors were extracted: lacking punctuality and lacking planification. Various studies have shown an internal consistency of AIP around α = .84 (Díaz-Morales et al., 2006a).

1.1.5.3. Decisional Procrastination Scale. The DPS (Mann, 1982) is a 5-item, self-administered inventory designed to measure procrastination in making decisions. The items are scored on a 5-point Likert scale, where 1 stands for "not at all true of me" and 5 for "always true of me". Hence, high scores (the maximum possible being 25) indicate a tendency to postponing decisions and subsequent actions by performing other activities. The medium score for the Spanish population is one of 13 points (*SD* = 4; Díaz-Morales et al., 2006b). Coefficient alpha of about .81 was reported by various studies (Díaz-Morales et al., 2006a, Ferrari & Dovidio, 2000). We used the Spanish version of the questionnaire, adapted by Díaz-Morales and colleagues (2006a).

In our studies we measured procrastination as well using a single item included in a constructivist assessment tool – the Repertory Grid Technique (RGT), described in detail in section 3.1.3.

1.1.5.4. Other Scales and Their Characteristics. An important distinction among the variety of available scales is the domain on which they focus (van Eerde, 2003). Some of them attempt to measure general procrastination, like the aforementioned GPS, AIP, or Tuckman's (1991) Procrastination Scale, as well as two scales developed by Steel (2010a) – Pure Procrastination Scale (PPS) and Irrational Procrastination Scale (IPS). Other scales assess academic procrastination specifically, for example Tuckman's (1991) Procrastination Scale, Procrastination Assessment Scale for Students (PASS; Solomon & Rothblum, 1984), Academic Procrastination Scale (Milgram & Toubiana, 1999), Procrastination Self-Statement Inventory (Grecco, 1984), Test Procrastination Questionnaire (Kalechstein et al., 1989) or Aitken Procrastination Inventory (API; Aitken, 1982). The DPS focuses on a yet another domain – decisional procrastination. Finally, Fernie, Bharucha, Nikčević, and Spada (2017) created a scale (named the Unintentional Procrastination Scale) designed to measure the controversial (discussed above) construct of unintentional procrastination.

All these scales measure procrastination by summing the scores of self-report items (usually assessed on a 5-point Likert scale). Hence, a higher score indicates an increased level of procrastination, but, as Zhang, Liu, and Feng (2019) indicate, there is no standardized way of dividing people into procrastinators and non-procrastinators. In general, a median split is used to create this distinction (van Eerde, 2003). Both van Eerde (2003) and Zhang, Liu, and Feng (2019) underline the fact that all the aforementioned questionnaires measure procrastination as a trait, thus not taking into account the specifics of the task (e.g., the level of difficulty or aversiveness), situational context, motives, affect, or performance. Many studies have assessed these other variables concurrently or later using other instruments (van Eerde, 2003). Some researchers have used additionally other ways to assess procrastination. These methods involved reports of how

much time people plan to study and how much time they actually study (Krause & Freund, 2014) or measuring time used to complete a task such as reading, writing or sending a questionnaire via email (Ariely & Wertenbroch, 2002; Glick & Orsillo, 2015; McCrea et al., 2008).

Klingsieck (2013) points out that another limitation is that not all items of the scales express procrastination in a way that would be completely faithful to its definition. She claims that whenever the words „delay" or „postpone" are used in the items instead of „procrastinate", it is assumed that they are identical with procrastination, but, according to its definition, they are not. In this regard Klingsieck praises Steel's (2010) PPS and IPS in which every item refers strictly to procrastination. Zhang, Liu, and Feng (2019) indicate that it is necessary to create more detailed ways of assessing procrastination, for example by using laboratory experiments, so that this phenomenon can be studied and understood thoroughly.

1.1.6. Treatment Proposals

1.1.6.1. Efficacy of Procrastination Treatments. The rise of scientific interest in procrastination has led to the development and adaptation of a variety of therapeutic interventions. They are definitely needed not only because procrastination causes discomfort and, as we mentioned before, is related to a vast array of serious negative consequences, but as well because procrastinators find it difficult to change their behavior, even though they dearly want to do so (Grunschel & Schopenhauer, 2015).

Unfortunately, not many of the publications on such interventions have good methodological properties, such as sufficient group sizes or control group design (Klingsieck, 2013). Nevertheless, the meta-analyses conducted to assess the efficacy of psychological treatments provide promising conclusions, confirming that there are certainly some effective ways of treating this problem (Malouff & Shutte, 2019; Rozental et al., 2018; van Eerde & Klingsieck, 2018). While the meta-analysis conducted by Rozental et al. (2018) showed that the twelve reviewed interventions gave only a small effect in treating procrastination (with cognitive behavioral therapy standing out and

providing a moderate effect), the other two meta-analyses gave more optimistic results. Malouff and Shutte (2019) analyzed twelve studies with randomized controlled trials and found a large positive effect of the interventions. Moreover, they found that higher effects were associated with interventions delivered to students (versus general members of the community), in-person treatments (versus online interventions), and a control condition in which no treatment was conducted. Finally, van Eerde and Klingsieck (2018) analyzed 24 studies and found a large effect in procrastination reduction, with the effects remaining stable in follow-up evaluations. They found as well that cognitive behavioral therapy decreased the procrastination more than other treatments and that other moderators had no significant effects.

With the aim of providing a brief overview of the existing interventions for treating procrastination, we will use a division similar to the one proposed by van Eerde and Klingsieck (2018) in their meta-analysis, putting however more emphasis on constructivist approaches because of the interventions and tools used in our studies.

1.1.6.2. Self-Regulation. According to van Eerde and Klingsieck (2018), interventions aiming at increasing self-regulatory strategies are designed to better manage both internal (e.g., attention, emotion, vigilance, motivation, and volition) and external resources (e.g., situational context of work/study environment, social support, and time). Interventions that focus on self-regulation tend to promote especially the ability to manage one's time within work and life. Such interventions focus mainly on goal setting in order to increase intrinsic and extrinsic motivation (Ariely & Wertenbroch, 2002; Gustavson & Miyake, 2017; Kaftan & Freund 2020; Muñoz-Olano & Hurtado-Parrado, 2017), planning and organizing (Gieselmann & Pietrowsky, 2016; van Eerde, 2003), learning study skills (Tuckman & Schouwenburg, 2004), as well as monitoring time (Häfner et al., 2014). As van Eerde (2015) notices, the fact that time management does not focus on the emotional aspects of procrastination can be a disadvantage leading to worse results of such interventions. Therefore, time management interventions tend to be combined with techniques and

strategies aimed at maintaining the non-procrastinatory behavior (van Eerde & Klingsieck, 2018). Other interventions focused on increasing self-regulation include emotion regulation (Eckert et al., 2016), self-reflecting and self-monitoring (Mühlberger & Traut-Mattausch, 2015), self-motivation (Ghadampour et al., 2017; Grunschel et al., 2018), and stimulus control used to remove cues that can create distractions while initiating or completing the task (Grunschel et al., 2018; Mulry et al., 1994; Ziesat et al., 1978). Interestingly, Ma et al. (2019) found that time management can reduce the effect that hindrance caused by external stimuli has on workflow.

1.1.6.3. Cognitive Behavioral Therapy. Cognitive behavioral therapy (CBT; Beck, 1963, 1976) and its associate modalities such as rational-emotive behavior therapy (REBT; Ellis, 1962) are widely used when intervening in procrastination (Dryden, 2012; Malouff & Shutte, 2019; Rozental et al., 2018; van Eerde & Klingsieck, 2018). In fact, one of the first self-help books on procrastination (Ellis & Knaus, 1977) was written from a REBT perspective and conceptualized this problem as a consequence of irrational or dysfunctional beliefs. This vision is indeed the fundament of CBT, REBT, and other models that build on their tradition. Their founders state that symptoms, including procrastination, are a result of one's core beliefs expressed in thoughts and emotions. A more contemporary theory inspired by CBT sees procrastination as resulting from schedules of reinforcement (ratio, timing, and the interval of rewards and punishments on response, first described by Ferster & Skinner in 1957), delay sensitivity, and biases and heuristics (Rozental and Carlbring, 2014). Therefore, in therapeutic practice the clinician checks if client's thoughts are functional or dysfunctional and corrects the latter. This correction should result in a functional behavior and a decrease in symptom intensity. In the recent years, a few randomized controlled trials of CBT group therapy for procrastination have yielded very promising results indicating moderate to large between-group effect sizes (e.g., Rozental et al., 2015; Toker & Avci, 2015; Wang et al., 2017).

A CBT/REBT treatment of procrastination would usually include exploring the story of procrastination in one's life, jointly discovering and understanding the assumptions, irrational beliefs, and automatic thoughts regarding this habit, and then changing these beliefs into productive, functional ones, as well as, of course, changing the procrastinatory behavior (van Eerde & Klingsieck, 2018). The irrational beliefs often found when dealing with procrastination are related to self-doubt, fear of failure, low self-esteem, low self-efficacy, and perfectionism (Schraw et al., 2007; Uzun Ozer et al., 2013). Cognitive interventions for procrastination may involve, for example, cognitive restructuring (McDermott, 2004), inquiry-based stress reduction (IBSR; Krispenz et al., 2019), motivational interviewing (Miller & Rollnick, 2012), implementation intentions (Gollwitzer et al., 2009) or mental contrasting (Oettingen et al., 2005). The behavioral aspect of CBT/REBT treatments aims at increasing automaticity, enhancing time management, and preventing distractions (van Eerde, 2000). Such interventions include, for example, behavioral activation, behavioral experiments, and graded exposure to the avoided activity (Rozental & Calbring, 2014), so that the individual can deal better with worry, boredom, or unpleasantness that procrastinators often report (Schraw et al., 2007). Sometimes time management strategies are included in a CBT/REBT intervention, though if it happens, they are adjusted to the cognitive behavioral framework (van Eerde & Klingsieck, 2018). Such a framework was used as well in a successful randomized controlled trial that studied the use of an application created to help procrastinators in a smartphone-based intervention (Lukas & Berking, 2018).

1.1.6.4. Constructivist Approaches. Among other interventions used to help procrastinators, constructivist (Feixas & Villegas, 2000; Neimeyer, 2009) approaches play an important role. This is so because they respond well to the fact that the reasons for which people procrastinate may, as we described above, vary a lot. Therefore, we may say that each procrastinator is different and requires an idiographic approach. This perspective coincides with TMT – Steel (2007) argues that one can procrastinate because of any one of the four constituents of the

"procrastination equation". Hence, the fact that, firstly, constructivist interventions are focused on reconstruing the subjective meaning that people give to reality, themselves, and others, and, secondly, they stress the necessity of tailoring each therapeutic process according to client's specific characteristics, needs, and values (Neimeyer, 2009) makes them well-suited to work with procrastination. The necessity of creating and performing individually adjusted interventions has been stressed by many researchers of the topic (Díaz-Morales, 2019; Klingsieck, 2013; Rozental & Carlbring, 2014; Steel, 2007).

Coherence therapy (Ecker & Hulley, 1996, 2019) is a constructivist, experiential approach that focuses on discovering, integrating into consciousness, and transforming the implicit emotional schemas (different for each person) that make the symptom necessary to exist because of its protective, adaptive functions (Ecker & Hulley, 1996; Ecker et al., 2012). The authors state that procrastination is one of the symptoms that can be dispelled in coherence therapy (Ecker et al., 2012) and a randomized controlled trial was conducted in order to confirm this fact (Rice et al., 2011).

Other constructivist interventions that can help to reduce procrastination are, for example, Kelly's personal construct therapy or its creative modality – fixed role therapy (Kelly, 1955/1991; Neimeyer et al., 2003; Neimeyer, 2010). In both cases the intervention may be performed using the data gained from a constructivist assessment tool – the aforementioned RGT (described thoroughly in section 3.1.3.6.). The fact that constructivist approaches focus on intervening on the level of subjective meanings or constructions can be helpful to procrastinators as well because it seems that those who procrastinate have a lesser sensation of meaning or purpose in life. This may indicate that the lack of meaning leads to a breakdown of will and of the sensation of agency which may facilitate procrastination. Hence, the more meaning in life, the less procrastination (Ivannikow et al., 2019; Shanahan & Pychyl, 2007).

Among other approaches that have been used to treat procrastination, we may find as well paradoxical interventions, stemming from ericksonian (Matthews et al., 1993) and strategic (Watzlawick et al., 1974/2011) approaches, the latter usually considered as belonging epistemologically to constructivism. Within such treatments a therapist may overtly suggest that the person should keep on procrastinating and when they defy against this assignment, they start working with no procrastination (Lopez & Wambach, 1982; Mulry et al, 1994; Shoham-Salomon et al., 1989; Wright & Strong, 1982). Another paradoxical intervention would be to restrict the time available to fulfill the task (Höcker et al., 2012).

Finally, O'Callaghan (2004) proposed using a narrative approach (White & Epston, 1990) in treating procrastination, so that academic procrastinators can „reauthor" or reconstruct the narrative regarding procrastination. Narrative therapy belongs as well to the constructivist realm of psychotherapeutic approaches, more specifically to its social constructionist branch (Raskin & Debany, 2018).

1.1.6.5. Other Approaches. Acceptance and Commitment Therapy (ACT; Hayes et al., 1999) is another approach used in treating procrastination (Scent, & Boes, 2014; Wang et al., 2017). When compared to CBT in a randomized controlled trial (Wang et al., 2017), both approaches showed remarkable results in reducing procrastination, with ACT having even better long-term results. A variation of ACT, Acceptance-Based Behavior Therapy (ABBT; Roemer & Orsillo, 2005) has been also used as a promising intervention regarding this problem (Glick & Orsillo, 2015). Both approaches have an initial objective of decreasing psychological inflexibility through a reduction in avoidance of unpleasant thoughts and emotions (similarly to what happens when practicing meditation). This is achieved through psychoeducation, mindfulness, and expressing one's values (Glick & Orsillo, 2015). In the following stage of therapy, the participant is encouraged to define and rehearse the thought patterns and experiences that could drive the new, valued behaviors and then to engage in them (Wang et al., 2017). In fact, the acceptance element of ACT and ABBT

seems to correspond well with the findings showing that mindfulness (Cheung & Ng, 2019), self-compassion (Sirois, 2014; Sirois et al., 2019), empathic perspective (Blouin-Hudon & Pychyl, 2016) and self-forgiveness (Wohl et al., 2010) reduce procrastination, partially by decreasing negative affect. Another study (Boath et al., 2013) found that decreasing negative emotions and, consequently, enhancing academic performance seems to be possible as well using Emotional Freedom Techniques (EFT; Craig, 2011; Craig & Fowlie 1995), known as well as *tapping* (see also the self-help book of Arenson, 2009).

In the recent years, novel ways of treating procrastination have emerged as well. These interventions are based on assertiveness and strength training which should help procrastinators to increase their self-efficacy and thus decrease their procrastination (Moradi, 2015; Visser et al., 2017). Procrastination has been treated as well using relaxation techniques (Binder, 2000) and psychoeducation (Lukas & Berking, 2017; Rozental et al., 2015). Lately, journaling has been proposed as a possible tool for understanding one's procrastination, as well as finding motivation and direction for change (Hensley & Munn, 2020).

1.2. The Personal Construct System and its Conflicts

The objectives of this dissertation, described in chapter 2, include mainly the analysis of cognitive structure and cognitive conflicts (CCs) of students who procrastinate, as well as the change in this structure resulting from psychotherapy. The theoretical framework of our research is Personal Construct Theory (PCT; Kelly, 1955/1991) which is considered a constructivist theory of personality (Feixas & Villegas, 2000; Neimeyer, 2009). The notion of CC adopted by us has been proposed and operationalized within PCT. The analysis of these conflicts, their implications for therapeutic change, and the development of therapeutic interventions, have been the focus of more than 20 years of studies performed by our research group under the Multi-Center Dilemma Project

(MDP), founded in 1999 (Feixas & Saúl, 2004). In subsequent sections, we describe the theoretical framework and the operationalization of CCs in our work.

1.2.1. Personal Construct Theory

PCT (also known as Personal Construct Psychology) was proposed by the American psychologist and professor George A. Kelly. He created his model between 1930s and 1950s and published his *magnum opus* – "The psychology of personal constructs" – in 1955. Kelly's proposal stems not only from his theoretical pondering but is based as well on his therapeutic practice performed in rural Kansas with a crisis-struck population. He realized that these people needed to be helped in a different way than those suggested by the then-reigning psychotherapeutic approaches – psychoanalysis and behaviorism (Neimeyer, 2009). Kelly's broad experience resulted in writings in which he delineates not only a comprehensive theory of personality, but offers as well guidelines and methods for diagnosis, research, and treatment (Kelly, 1955/1991; Maher, 1969).

At the epistemological level, PCT is a constructivist approach (Feixas & Villegas, 2000; Neimeyer, 2009). To be more precise, Kelly pioneered constructivist thinking in the areas of personality and psychotherapy because constructivism as such did not appear formally in the scientific community until 1970s (Fleischer, 2010), and settled in psychological theories specifically even later – in the 1980s (Feixas & Villegas, 2000). It was 1978 when two of the founding fathers of constructivism – biologist Humberto Maturana and physicist and cybernetician Heinz von Foerster – organized a congress called "Construction of reality" in San Francisco. During this event, they postulated the need of formulating a new epistemology – one that stated that objective observation of reality is impossible because the observers are always immersed in the observed world, thus influencing the operations of observation. Hence, each observation is always somebody's observation, and the observers observe in a specific, subjective manner (Fleischer, 2010).

Constructivism, which stems from insights from such diverse fields of science as physics, biology, psychology, philosophy, cybernetics, or neurophysiology, states that it is impossible to get to know the reality directly, in an objective manner, as realism or objectivism would suggest. Instead, people – cognizing subjects – create their own constructions or meanings of reality actively and generatively, as Ernst von Glasersfeld (1988), another of the founding fathers of this epistemology, reiterates. At the same time, however, we are constrained by the characteristics of our closed "operating system" formed by our nervous and motor systems (Maturana & Varela, 1984), and by being immersed in specific contexts, like culture, family, or language (Feixas & Villegas, 2000; Fleischer, 2010; Neimeyer, 2009). Von Glasersfeld (1988) pinpointed that our main purpose when cognizing is to adapt ourselves as well as possible to the experiential world and to subjectively organize this reality, so that our construction of it is as viable as possible. We may see, hence, that constructivists abandoned the modernist ambition of discovering an objective truth and one concrete ontological reality.

Interestingly enough, the conclusions of the aforementioned originators of constructivism were present already in PCT. Kelly defined his posture as *constructive alternativism* according to which "all of our present interpretations of the universe are subject to revision or replacement" (Kelly, 1955, p 15.). In accordance with it, PCT's fundamental postulate says that "A person's processes are psychologically channelized by the ways in which he anticipates events" (Kelly, 1955, p. 32). Therefore, our way of being depends on our ability to construct the past, present, and future (Cummins, 2006). Contrary to the self-named "radical constructivists" who denied the existence of an independent reality (von Glasersfeld, 1984), Kelly accepted that this reality existed, but stated that we do not have a direct, objective access to it. In consequence, we construe the reality subjectively and create meanings of it based on our experience. The basic act of experience is, according to Kelly, capturing a difference or distinction within human perception – this is how personal constructs (meanings) are created. These constructs are bipolar, dichotomous pairs of

alternatives (e.g., open-minded vs. close-minded, conscientious vs. procrastinating, authentic vs. false). They are organized in a hierarchical manner, with superordinate constructs "governing" the subordinate ones. Among the first ones we can find core constructs which define self-identity and important for maintaining a sense of personal continuity and coherence. Therefore, they are more difficult to be modified. Peripheral constructs, on the other hand, are more prone to be changed if needed. Kelly (1955/1991) stated that from the two poles of a given construct, we tend to choose the one that allows as to further extend and better define our construct system (see choice corollary below).

PCT asserts that, basing ourselves on our experiences, or rather the subjective meaning we attach to these experiences (Kelly, 1955/1991), we create a dynamic personal construct system that gives us an idiosyncratic map of reality. However, as Korzybski (1933), who inspired Kelly with his theory of general semantics (Neimeyer, 2009), stated, the map is not identical with the territory. We use this map to interpret and understand the surrounding world in the most viable possible way. It is worth stressing that we do not perceive this map as a mere map, but we rather take it as an ontologically factual and self-evident reality. This way, we become fully immersed in our own construction of reality, at least until we become aware that we are actually authoring it and that we *are* our constructs (Ecker & Hulley, 1996; Neimeyer, 2009). As we can see, Kelly's vision of human functioning is fully consistent with constructivist ideas, formulated decades later (Feixas & Villegas, 2000).

As a complement to his fundamental postulate, Kelly described eleven corollaries that form a base of his theory (adapted from Kelly, 1955/1991):

1. Construction corollary: A person anticipates events by construing their replications.

2. Individuality corollary: People differ between each other regarding their construction of events.

3. Organization corollary: Each person develops, according to their convenience regarding anticipation of events, a construction system that implies ordinal relations between constructs.

4. Dichotomy corollary: Each person's construction system consists of a finite number of dichotomous constructs.

5. Choice corollary: Within a dichotomous construct a person chooses the alternative through which they anticipate a greater possibility of extending and defining their system.

6. Range corollary: A construct is convenient for anticipation of a finite number of events.

7. Experience corollary: The construction system varies as the person is successively construing replications of events.

8. Modulation corollary: The variation in a person's construction system is limited by the permeability of the constructs within whose range of convenience the variants are situated.

9. Fragmentation corollary: A person may successively employ a variety of construction subsystems that are incompatible between each other.

10. Commonality corollary: Two persons' psychological processes will be similar to the extent to which they employ a similar construction of their experience.

11. Sociality corollary: To the extent that a person construes construction processes of another person, they may play a role in a social process that implies this other person.

These corollaries may be treated as the rules for the personal construction of reality. In order to define how the latter occurs, Kelly used a metaphor of a person as a proactive scientist (picked up later by the creator of cognitive therapy, Aaron Beck) who constantly creates hypotheses about the reality and tests them in practice, through their experience. This process was coined by Kelly as the everlasting "cycle of experience" in which people inevitably engage. In the first stage of the cycle, a hypothesis or anticipation is created based on the constructs erected from past experiences or, in other words, past cycles of experience. This happens often unconsciously, though in a fully coherent manner as our main objective is adaptation and for that we need to ensure the viability of our

constructions. The second phase of the cycle, called “investment”, represents the degree of importance that the upcoming event has for us. This importance depends on the centrality of the constructs implicated in the event – the more central are our personal constructs in this specific situation, the more are we investing. Next, there is the actual “encounter with the event” where our anticipation gets tested in confrontation with the external reality. Here, like in a scientific experiment, the hypothesis can be either validated or invalidated which constitutes the fourth phase of the cycle. Finally, in the fifth phase, depending on what happened with our anticipation, the personal construct system may be either consolidated or revised. At the same time, this final phase precedes and influences forming the next anticipation as the cycle continues (Kelly, 1955/1991).

The cycle of experience is not a reflection of purely cognitive, individual processes but encompasses the human experience as a whole, including its emotional and relational aspects. As we can see in the commonality and sociality corollaries, Kelly emphasized the importance of the relational dimension of meaning construction. People anticipate and interpret their interaction with others as well as others’ actions, attitudes, beliefs etc. It is mostly in the relational context where our personal constructions are validated or invalidated. This is, to a large extent, how we construe our own sense of identity (Feixas & Compañ, 2016).

The view that Kelly’s model is a cognitive theory that avoids dealing with emotions is another common misunderstanding that PCT theorists and practitioners have challenged (Cummins, 2006; Neimeyer, 2009). Kelly abandoned the distinction between cognition and emotion, focusing instead on meanings – reflected in personal constructs as their essential units. Therefore, in line with constructivist thinking, psychotherapy becomes an “intervention in meaning” where the change is brought by reconstruction of these meanings (Neimeyer, 1993, 2009). Such an intervention may be needed if the cycle of experience gets blocked at one of the stages. This impedes a viable and adaptive anticipation of events by diminishing the predictive capacity of the construct system (Neimeyer & Feixas, 1989). More precisely, Kelly (1955, p. 831) described

psychological disorder as “any personal construction that is used repeatedly in spite of consistent invalidation”, a process which he called “hostility”. This may happen, for example, when the invalidated construct is a core one, and changing it is anticipated as a threat to one’s identity and sense of continuity, possibly resulting in resistance to change. Hence, even a behavior that seems to be dysfunctional at first glance, may be just a coherent, though unconscious, expression of trying to protect the most core aspects of one’s identity, even if this protection causes suffering due to unwanted patterns or symptoms (Ecker & Hulley, 1996).

The topic of change of personal meanings brings us to the realm of personal construct psychotherapy. As we mentioned above, such psychotherapy focuses on reconstruing meanings instead of counteracting certain symptoms, coaching specific skills, or changing “maladaptive”, as objectivists would say, beliefs (Neimeyer, 2009). In fact, Kelly was rather dismissive of traditional conceptions of psychopathology. He viewed his model as one serving life reconstruction and conceived the role of the therapist as similar to an anthropologist accepting the validity of various experiential realities (Feixas & Villegas, 2000).

To describe therapy, Kelly used science-related metaphors again. For him, the therapeutic relationship is similar to the one of researchers and their supervisors. Clients, just like scientists, usually look for some kind of a change or reconstruction of (their) reality. In the case of psychotherapy, it is their own life that will be reconstrued and they are the best experts regarding it. Therapists, on the other hand, are experts in the management of the psychotherapeutic process and settings. Together they engage in designing “experiments”, so that clients’ anticipations may be confronted and thus seen by them in a different light. This way, alternatives for old meanings may be created and the construct system revised, so that the undesired behaviors or symptoms lose their function and the experiencing human can “cycle” smoothly through reality again (Kelly, 1955/1991; Neimeyer & Winter, 2007).

Kelly's therapeutic stance is always accompanied by a "credulous approach" – an attitude of curiosity and "not knowing" which derives directly from his assumption about the lack of one, timeless truth about reality. In practice, a personal construct therapist tries to view the world through their clients' constructs with empathy and interest, at the same time using professional constructs to guide the psychotherapy process. The therapist is a validating agent, helping the clients in going through the, sometimes painful (invalidations included), maze of reconstruction (Botella & Feixas, 1998; Kelly, 1955/1991). As Neimeyer (2009) writes, "The therapist does not decide what new meanings will be created, but instead assists clients in recognizing incompatible old meanings or constructs and works with them as they endeavor to find alternatives" (p. 61).

1.2.2. Cognitive Conflict from the Perspective of PCT

1.2.2.1. Cognitive Conflict in Psychological Thought – an Overview. The notion of intrapersonal conflict has been a recurring theme in psychology and psychotherapy for more than a century. From early psychoanalysis in the end of 19th century to multiple cognitive, social, or developmental theories in the 20th to neuroscientifically inspired explanations in the first decades of the 21st century, various authors representing a wide scope of approaches have struggled to decipher the enigma of the mechanisms that influence the existence of internal conflicts and their resolution (for reviews across various approaches see, for example, Cantor, 1983; Ecker, 2018; Michalak et al., 2011; Saúl, 2005).

As Saúl (2005) points out, the diverse definitions of cognitive conflict are to some extent related to the classic questions of the "neurotic paradox" and resistance to change. Mowrer (1950, p. 524) stated that "the neurotic paradox lies in the fact that human behavior is sometimes indefinitely perpetuated despite the fact that it is seriously self-defeating". So, why do we persist doing (or feeling) something that makes us suffer, even though we dearly want to get rid of this suffering? What makes us resist the change despite our (and our therapists') explicit motivation for it (for a review of the topic of resistance, see Safran & Muran, 2000)?

It is of no surprise that the first author to focus his attention on internal conflicts was Sigmund Freud. In unconscious conflicts he saw the origin of psychological disorders (Freud & Breuer, 1937). According to Freud, the conflict is created by the tension between opposing internal drives or forces, for example between the id, ego, and super-ego. The resistance, on the other hand, is an information for the therapists that they are touching on clients' core conflicts that underlie presenting symptoms (Freud & Jones, 1922). Further psychoanalytic and psychodynamic theories and therapy approaches have kept the internal conflict in the center of their attention as well (e.g., Della Selva, 1996; Jung, 1952; Horowitz, 1988).

Another well-known theory of cognitive conflict is the one of cognitive dissonance (Festinger, 1957), preceded by Heider's (1946) balance theory. Both social-cognitive authors state that when we are faced with a situation of internal inconsistency between values, beliefs, or ideas, we are motivated to elude it or resolve the contradiction either by changing the behavior or modifying the original belief, so that we can avoid the internal tension caused by the conflict. A clinically oriented (and neuroscientifically informed) reflection of these theories is, for example, Grawe's (2004) consistency theory according to which people struggle for "compatibility of many simultaneously transpiring mental processes" (Grawe, 2007, p. 170) and for congruence between their psychological needs and perceived reality.

Developmental psychologists, on the other hand, focused on cognitive conflicts as a natural and necessary part of psychological and social maturation. Erikson (1950) saw the integration of conflicts between polarities (such as basic trust vs. lack of trust or initiative vs. guilt) as an essential task to complete each developmental phase. In his theory of positive disintegration, Dąbrowski (1964) viewed tension, anxiety, and other symptoms of distress as necessary signs of deconstruction of present stages of development and first steps towards a reconstruction of personality at higher levels. Finally, the constructivist pioneer Piaget (1974) focused on children facing cognitive conflicts when trying to explain certain events. In a situation of disequilibrium it comes out that the

present construction of reality is no longer adaptive and children need to reconstrue and update it, so that they can restore cognitive balance at a higher level of development.

Apart from psychoanalytic and psychodynamic approaches, other schools of therapy have stressed the importance of internal conflict and its role in the therapeutic process as well. Rogers (1951), the father of humanistic psychology, stated that resistance to change appears when people encounter contradictory experience which involve a threat to their self-concept. Gestalt therapy (Engle & Holiman, 2002) and other humanistic-experiential approaches, such as emotion-focused therapy (Greenberg, 2017), use the two-chair dialogue for resolving conflict between two parts of the self (e.g., one that wishes to change and the one that resists it). The non-pathologizing focus on such conflicting parts has been shared as well by dialogical approaches (Hermans, 1996; Valsiner, 2002).

On the other hand, cognitive behavioral approaches, like CBT (Beck, 1963) or REBT (Ellis, 1962), take a more objectivistic stance, consistently with the epistemology they represent. The symptom is not understood as an expression of conflict, but rather as a result of dysfunctional beliefs that should be revised. Nevertheless, cognitive behavioral pioneers acknowledge that cognitive conflict is a source of distress and negative arousal (Wolpe, 1958) that leads to avoidance and resistance (Mowrer, 1950). More recently, a few authors from cognitive behavioral spectrum of approaches, have acknowledged the importance of conflict formulation in therapy (Carey, 2008; Latzer et al., 2008) and of protective function of resistance (Aviram et al., 2016; Leahy, 2001).

Systemic therapies took still another approach. Traditionally, as Saúl (2005) observes, a systemic psychotherapist would say that the symptom is not an expression of an individual, internal conflict, but rather an information about a relational conflict in the surrounding system (e.g., family of origin, couple etc.). Moreover, the symptom presented by the “identified patient” serves to maintain a *status quo* of the whole the system. In consequence, resistance is seen as an expression of core relational (not individual) dynamics (Saúl, 2005). Systemic therapists (e.g., de Shazer, 1984)

were in the vanguard of appreciating the protective function of resistance and used it in favor of the therapeutic process. More recent systemic approaches, heavily influenced by constructivism (Feixas, 1990; Hoffman, 1988; Montesano, 2012; Ugazio, 2013), included the importance of individual processes in their conceptualizations of conflict and resistance.

As we can see, all the above-mentioned theories and approaches (including PCT and constructivist approaches, described in detail in the next section), seem to coincide in the conclusion that people do not act in a mechanistic, logical manner, and that cognitive conflict and resistance to change are a somehow natural process. As Mahoney (2003) noticed, changes in the concept of self may be perceived as threatening because the very self is paradoxical – changing and permanent at the same time. The revision of numerous theoretical approaches performed by Michalak et al. (2011) seems to confirm these words. They found two main assumptions across various texts. Firstly, distressing effects of cognitive conflicts play an important role in the onset and maintenance of psychological disorders. Secondly, the internal conflict is an important motivational factor that can influence the psychotherapeutic process greatly, causing inhibition and difficulties in achieving change. Let us see, then, how cognitive conflicts are conceptualized within PCT and other constructivist approaches.

1.2.2.2. PCT and Cognitive Conflicts – a Constructivist Framework. PCT provides a solid conceptual and methodological framework for the study of cognitive conflicts and their operationalization in clinical context (Caputi et al., 2012; Feixas et al., 2009; Feixas & Compañ, 2016; Montesano et al., 2015; Walker & Winter, 2007; Winter & Tschudi, 2012). The non-pathologizing vision of an agentic (Bandura, 2001; Mahoney, 2003), meaning-making person who creates their reality adaptively, and strives for maintaining a sense of coherent identity is the fundament of this framework. Taking into account these assumptions, it is no wonder that Kelly dismissed the concept of the neurotic paradox quite directly:

[T]he behavior of a so-called neurotic client does not seem paradoxical to

> him until he tries to rationalize it in terms his therapist can understand. It is when he tries to use his therapist's construction system that the paradox appears. Within the client's own limited system he may be faced with a dilemma but not with a paradox. (Kelly, 1969, p. 85)

Kelly did not see anything neurotic or paradoxical in the internal conflict. For him, it reflected a dilemma within the construction system. A dilemma that can be solved by the free, agentic self. As we can see in the fragmentation corollary, some personal constructs may be inferentially incompatible among each other. This means that the personal construct system is not always logical and totally integrated despite its hierarchical organization (Feixas et al., 2009). Moreover, people often face discrepancies within specific constructs between the way they are (their present self) and the way they would like to be (their ideal self). According to Kelly (1955/1991), and coinciding with other authors (Carver & Sheier, 1998; Cervone & Shoda, 1999; Higgins, 1987), we regulate our actions, emotions, and motivations in line with the congruence and discrepancy between these two aspects of self.

PCT states that in a situation of incompatibility between and within constructs the person will choose (usually unconsciously) those constructs and their poles that allow for better predictability and definition of the system (choice corollary). The beneficiaries of this choice are typically core identarian constructs that need to be protected for the sake of personal coherence and sense of continuity, even if it causes suffering and peripheral construct invalidation (Feixas, 2016). Mahoney (1988) notices that the central, nuclear constructs particularly resistant to change are the ones related not only to identity, but as well to the sense of reality, power/control, and values.

If a dilemma is a result of free (even if implicit) choices that lead to the possibly most adaptive construction of reality, then the symptom of suffering resulting from the dilemma needs to have a meaning as well. Indeed, many PCT researchers who focused on the study of cognitive conflicts were able to discover such meanings in symptoms that would seem to be meaningless and

dysfunctional at first (objectivist) glance. For example, Fransella (1970) coined the notion of "symptom as a way of life" when she found out that people who stutter built their whole identity around their speech problem. As soon as they were deprived of it, owing to an (apparently) successful therapeutic interventions, their construction system lost much of its predictive capability regarding self and others. Button (1983) noticed an analogous pattern in anorexic patients: it seemed that they were construing themselves and their relationships around the core construct of slimness and food control. Hence, change was seen by them as a threat which provoked resistance. Similarly, Winter (1988) observed that socially anxious clients who failed at successfully completing social skills training had a negative construction of people with social competences – they saw them as "highly selfish", "too energetic", "closed to alternatives", or "with little tenderness". All these features were opposed to their core identarian construct of being a "good person", so change was blocked, even though their social anxiety caused them real problems. To give one last example, Rowe (1971) described a case of a depressed client who associated being happy with becoming "destructive" and "unpleasant", so she preferred staying depressed which meant for her "being human" – a core construct that needed to be protected from invalidation. The conclusions from the enumerated observations were reinforced by a study that showed that the more positive implications had a symptomatic behavior, the more difficult it was to achieve the desired objectives (Catina et al., 1990).

In sum, we can see in all the aforementioned situations of conflict that choosing to change where the change is needed and consciously desired would imply an unwanted, threatening change in a core construct. The systematic study of such conflicts within PCT was started by Kelly's doctoral student, Dennis N. Hinkle, who coined the term "implicative dilemma" (ID; 1965). He focused his attention on situations in which clients's symptoms bear a positive meaning for their identity creating resistance to change. Hinkle proposed first ways to assess and operationalize IDs

by using implication grids, followed by Fransella's bipolar implication grids and Tschudi's ABC model (for a revision of these and other early assessment methods, see Hardison & Neimeyer, 2012)

Hinkle's dissertation inspired many psychologists interested in cognitive conflicts. Apart from the PCT researchers enumerated above, Anthony Ryle is worth mentioning here because of his appreciation of Kelly's model and of the importance of dilemmas that became one of the fundaments of his cognitive analytic therapy. Ryle (1979) described two types of conflicts: "false dichotomies" ("either…or…") that restrict the range of choice, and "false assumptions of association" ("if…then…") that inhibit change. An example of the first situation applied to the topic of this dissertation could be the following statement: "I am either conscientious or sociable". The second type of dilemma can be found in a belief like "If I study in advance, I'll lose my freedom".

A recent constructivist approach, coherence therapy (Ecker & Hulley, 1996; 2019) focuses on experiential discovery and resolution of internal conflicts, drawing largely on PCT. Ecker and Hulley describe the dilemma between the "anti-symptom position" which expresses the need for change, and the "pro-symptom position" – the implicit meaning-loaded schema that, when discovered, explains why the symptom is adaptively necessary to have and what suffering, larger than the one caused by the symptom itself, would be caused by getting rid of it. Therefore, only when the underlying "emotional truths" are experientially transformed will the symptoms cease to exist. The authors see resistance to change the same way – whether conscious or unconscious, it is an information that client's core constructs are being threatened. Thus, the schemas underlying the resistance need to be discovered and transformed (Ecker & Hulley, 2019).

Finally, the researchers involved in the Multi-Center Dilemma Project (MDP), including our group, refined the notion of ID understanding it as an operationalization of CCs from the PCT's perspective (Feixas et al., 2009). One of the main aims of the MDP has been to further develop methods of study, assessment, and operationalization of IDs for psychotherapeutic purposes (Feixas et al., 2000; Feixas & Saúl, 2004; Feixas et al., 2009; Rouco et al., 2019). Although sometimes IDs

may be identified in therapy quite directly through some clinical clues, we use the Repertory Grid Technique (RGT or the grid) for these aims. This tool, created by Kelly (1955/1991) and described in detail in section 3.1.3.6., allows for individual assessment of IDs and other measures of clients' cognitive structure by performing a semistructured interview consisting in elicitation and rating of personal constructs regarding their relations to specific (chosen according to the topic of assessment) aspects of reality, called elements. The RGT has been used in more of 3000 publications in a wide variety of areas of application (e.g., Saúl et al, 2012). In the case of the interpersonal variant of RGT applied within the MDP, the elements category is formed by people who are significant in clients' lives and two aspects of self – the "self now" and the "ideal self". The ratings on these two elements allow to identify cognitive conflicts. Owing to the characteristics of the RGT, the measure of these conflicts is standardized and quantifiable at the structure level, and at the same time idiographic at the content one. What is more, the procedure does not contain any specific questions about conflicts. Instead, the latter are detected through a computerized analysis of the Grid data (see section 3.1.3.6.), so the effect of social desirability is largely decreased, and even conflicts of which the person is not aware can be discovered (Feixas, Montesano, Compañ et al., 2014).

For over two decades of research performed under the auspices of the MDP, the researchers have focused mostly on two types of internal conflicts assessed using the RGT – the IDs and dilemmatic constructs (DCs; see section 3.1.3.6.1. for a detailed description of both), the latter being still explored at the theoretical level and thus not included in our studies. DCs appear when the person rates the "ideal self" with a midpoint rating, without choosing either pole. This may mean that the person does not have a clear course of action which can provoke a roadblock for the construction system (Feixas & Saúl, 2004). On the other hand, the ID is detected when a congruent construct in which there is no need to change (the present and ideal selves are very close, situated on the same pole of the construct) correlates strongly with a discrepant construct in which the "self

now" and "ideal self" are at the opposite poles, meaning clearly that the person wants to obtain a substantial change in this construct (Feixas et al., 2000; Feixas, 2016). However, as we have indicated earlier, the desired change in the discrepant construct is blocked by the need of maintaining coherence in the congruent construct.

Various studies conducted by our group showed that the notion of ID is relevant when it goes to explaining the relationship of cognitive conflicts with the symptoms. What is more, these studies confirmed that IDs are present in about half of a sample of psychotherapy clients (Feixas et al., 2009), with this proportion reaching 72% in a sample of people suffering from bulimia nervosa (Feixas et al., 2010), 77% in one of patients with fibromyalgia (Compañ et al., 2011), 69,6% in a sample of dysthymia (Montesano et al., 2014), as well as 60% and 68%, respectively, in two separate studies of depressive clients (Feixas, Montesano, Compañ et al., 2014; Feixas, Montesano, Erazo-Caizedo et al., 2014). While IDs could be identified as well in control groups, their rates were much lower (ranging from 19% to 48%). All the intergroup differences were statistically significant with a medium effect size (Montesano et al., 2015). IDs were indicated to play a clinically significant role as well in samples of people suffering from anxiety (Melis et al., 2011), female victims of intimate partner violence (Soldevilla et al., 2014), as well as patients diagnosed with binge eating disorder (Escandón-Nagel et al., 2018), or those suffering from irritable bowel syndrome (Benasayag et al., 2011). IDs' importance in borderline personality disorder is being studied currently as well (Suarez & Feixas, 2020). A meta-analysis of nine studies (Montesano et al., 2015) confirmed that not only there is a significant association between the studied disorders and the presence of IDs, but the level of the latter correlates as well with symptom severity.

Moreover, treatment manuals for psychotherapy focused on dilemma resolution were created (Feixas et al., 2013; Feixas & Compañ, 2016; Senra et al., 2005; Paz et al., 2020) and the change of these conflicts owing to psychotherapy was analyzed, checking at the same time the efficacy of such treatments (Feixas et al., 2016; 2018; Paz et al., 2019). At the methodological level,

a dilemma-oriented psychotherapy is performed in accordance with Kelly's (and other constructivists') vision of cognitive conflict and with PCT as the theoretical base. As a rule, the therapist does not try to counteract the symptoms, but focuses instead on exploring the client's IDs discovered with the RGT and experientially, subsequently working with them towards a reconstruction of the personal construct system and, thus, a resolution of the conflicts.

1.3. PCT and Procrastination - Rationale for the Present Research

Procrastination is an extremely widespread problem that still needs to be better understood and addressed. In this thesis, we contribute to these aims by exploring this subject from a PCT point of view. To the best of our knowledge, no previous research on procrastination has been carried out within the realm of PCT and with the use of RGT. Hence, our work constitutes a novelty in this topic.

As it has been described in the introduction of this dissertation, procrastination is extremely common both in the student and general population. Moreover, a clear surge in its prevalence has been noticed in the recent years. As research shows, procrastination affects chronically both the physical and psychological health and is detrimental not only to the individual, but to the whole society, decreasing the levels of life satisfaction, academic and professional performance, financial efficacy and possibly creating more costs for the healthcare system due to the negligence in procrastinators' daily self-care as well as development and maintenance of chronic, stress-related conditions.

Students are the population most affected by procrastination which makes it reasonable to focus our research on this group. Not only do almost all students procrastinate from time to time and 50% of them do it chronically, but it seems as well that very few achieve getting rid of this destructive habit in their university years and many continue procrastinating in their adult life. From the constructivist, and specifically PCT, point of view, one of the essential reasons for maintaining

this habit may be related to the fact that procrastination has a very personal meaning and is fully coherent within the construct system of people who engage in it. Getting rid of it may be blocked due to the existence of specific cognitive conflicts related to procrastination. Therefore, this behavior becomes an adaptive solution, a “way of life” that protects the identity and helps to avoid a greater suffering. Our research will test if this is the case and if it is so, it will contribute to the understanding of the experience of procrastination in a person-oriented manner.

While the body of knowledge about procrastination has grown significantly in the last three decades, the research has been mostly quantitative and focused almost entirely on observable commonalities between procrastinators. Although today we know a lot about their general personality features, universal cognitions, or emotional and motivational hardships, we have little understanding of the deeper conflicts that may lead to developing procrastination as a solution to their conflicts and maintaining it over many years. Using the RGT will allow us to elicit and describe these underlying dilemmas of which the very procrastinator is often unaware. What is more, being a semistructured interview tailored specifically to each participant, this instrument provides high flexibility, and the obtained information combines quantitative and qualitative data. This way we will acquire a profound piece of knowledge about procrastination that will lead us far beyond the input available with the use of typical questionnaires.

The RGT and the specific indexes of cognitive structure provided by it (described in detail in section 3.1.3.6.) will allow us not only to analyze the cognitive conflicts of procrastinators, but as well to verify the previous research findings regarding some of the correlates of procrastination enumerated in sections 1.1.3. and 1.1.4. Among them, we will be able to check if procrastinators evaluate themselves more negatively and present a bigger discrepancy between their present and ideal selves than non-procrastinators (owing to the self now – ideal self dissimilarity index), if they are psychologically more rigid than controls (RGT’s cognitive polarization index), and if they are less happy than those who do not procrastinate (analyzing the scores on the construct related to self-

reported happiness). Other RGT indexes will allow to assess cognitive characteristics of procrastination that have not been evaluated so far, such as cognitive differentiation, discrepancies between the present and ideal selves versus other people, or the importance of the construct of procrastination among other components of the personal construct system. Additionally, the scores on the inventories used by us to measure symptom severity will possibly confirm the findings regarding increased level of stress, anxiety, and depression, as well as other negative emotion states suffered by procrastinators.

We believe as well that our research will deepen the comprehension of procrastination represented in the theoretical models that describe it from the volitional and motivational points of view. These perspectives, described in section 1.1.4.2., seem to point to the fact that the procrastinatory behavior is a result of a conflict, but they describe the possible conflicts in very broad terms, referring to notions such as action control, expectancy, intention, or task aversiveness. This thesis will provide the understanding of the specific idiosyncrasies behind each of these notions, allowing to decipher the subjective, conflictual meanings that have made the "procrastination equation" irresolvable for so many people.

Discovering one's internal conflicts and holding a conscious, empathetic attitude towards them can be, as many therapeutic approaches and traditional schools of personal growth point out, an essential vehicle for change. The constructivist approach used in our research is, according to us, a lacking piece in understanding procrastination. The results of our studies may lead not only to understanding the subjective meanings that drive procrastination, but as well to creating cutting-edge, non-pathologizing, effective treatments. We believe that the existing, "one size fits all" interventions have still much room for improvement. It may be gained by adding the element of defining (for example, with the help of RGT) and transforming the idiosyncratic internal conflicts that lie behind the procrastinatory behavior. Along the same lines of reasoning, our work will be useful for other researchers and therapists because we will describe the in-depth differences

between the personal construct systems of procrastinators vs. non-procrastinators, including the differences regarding viewing themselves, others, and the world in general.

Our second study reflects the intention of creating well-tailored interventions focused on discovering and resolving internal conflicts lying behind procrastination. We analyze the change in symptomatology and in the personal construct systems after applying a therapeutic intervention. We focus especially on the resolution of IDs and the change of the entire cognitive structure as analyzed with the RGT. Hence, we intend to understand the change beyond the level of procrastinatory behavior which should help in creating better, more effective treatment proposals that will focus on discovering and transforming cognitive conflicts, at the same time being able to address the possible resistance to change. In conclusion, the approach we adapt in our studies is an answer to the scientists' call for a more person-oriented stance in understanding and treating procrastination.

2. Objectives and hypotheses

2.1. Objectives

2.1.1. Main Objective

This dissertation had two main objectives. The first one was to advance the knowledge on procrastination by analyzing the cognitive structure of students who procrastinate and exploring the IDs that drive their behavior, thus being able to define the extent to which the subjective meaning given to procrastination affects personal identity and prevents the desired change (Study 1). Hence, our research would contribute to describe the distinctive features of procrastinators' personal construct system. The second main objective was to analyze the change in this structure and conflicts after receiving psychotherapy (Study 2). These aims were further explored and specified. In order to achieve them we conducted two interrelated studies.

2.1.2. Specific Objectives for Study 1

O1.1. Compare and analyze the cognitive structure and IDs of procrastinating students with a control group of those who do not present this problem in order to define the distinctive features of procrastinators' personal construct system and the conflicts they face when engaging in postponing behavior. Getting to know this data would make it possible for clinicians to understand the deep, underlying cognitive schemas and conflicts that possibly drive one's procrastination and thus design specific interventions that would target these conflicts directly, taking a fully person-oriented attitude in the diagnostic and intervention process.

O1.2. Analyze the relationship between the level of clinical symptomatology and procrastination. This would possibly confirm previous research findings which indicate that procrastination correlates with various symptoms of psychological and physical distress. If it is confirmed, this knowledge would be helpful as well to adjust therapeutic interventions, so that they take into account symptoms other than from procrastination itself.

2.1.3 Specific Objectives for Study 2

O2.1. Examine whether cognitive psychotherapeutic interventions reduced the levels of procrastination, depression, anxiety, and stress.

O2.2. Analyze the change in cognitive structure that occurred after an ultra-brief treatment of student procrastination in order to gain a better understanding of the changes (if any) in various cognitive factors and cognitive conflicts. This would allow us to determine if the intervention applied influences the change not only in the level of procrastination, but as well regarding the specific cognitive conflicts and constructions of reality lying behind one's delay behavior.

O2.3. Analyze the relationship between the change in cognitive structure and the change in clinical symptoms and procrastination level after having undergone treatment. This would allow us to identify if changing the cognitive schemas that are possibly related to the presence of procrastination, and thus diminishing the latter, leads to a decrease in distress. It would as well confirm the research findings which state that a higher number and frequency of cognitive conflicts correlate with higher levels of psychological suffering. A decrease in both of these measures would confirm the validity of psychotherapeutic interventions that focus in resolving cognitive conflicts and would be a promising development in treating procrastination this way.

2.2. Hypotheses

2.2.1 Hypotheses for Study 1

H1.1. We expected to find a higher presence as well as number and intensity of IDs in students who procrastinate in comparison to those who do not do it.

H1.2. We expected to find that students who procrastinate present more clinical symptomatology than those who do not do it.

H1.3. We expected to find that students who procrastinate have a more negative vision of themselves than those who do not do it.

Apart from these hypotheses, we explored as well the relationships between other variables extracted from the RGT and procrastination or its absence.

2.2.2 Hypotheses for Study 2

H2.1. We expected to find that a brief cognitive therapeutic intervention would produce a decrease in the level of procrastination and reduce the intensity of clinical symptoms.

H2.2. We expected that students with procrastination would experience a decrease in the presence as well as number and intensity of IDs after participating in a brief cognitive therapeutic intervention.

H2.3. We expected to find that the possible decrease of the number and intensity of IDs would correlate with the decrease of the intensity of clinical symptoms.

H2.4. We expected to find that the students who resolved their IDs after the brief cognitive therapeutic intervention would decrease their level of procrastination more than those who did not resolve their IDs.

We will also explore the changes (if any) in other measures of the personal construct system of the participants after the brief intervention.

3. Methods

3.1. Study 1

3.1.1. Design

The first study was observational. It had a cross-sectional, *ex post facto* design of the case-control modality. The sampling method was a convenience non-probability one. The study consisted of two groups: the procrastination one and the control one, the latter consisting of non-procrastinating students.

3.1.2. Participants

Study 1 included 128 participants: 67 who procrastinated and 61 who did not. A part of the first group (30 students) was recruited within our previous study. All of them were students from various universities in Barcelona.

3.1.2.1. Inclusion and Exclusion Criteria. The inclusion criteria regarding the procrastination group were the following: (a) being a student at the time of assessment; (b) age between 19 and 26 years; (c) reporting procrastination as a problem and scoring above 51 points in GPS; (d) having the procrastination construct scored in the RGT (Kelly, 1955/1991). The cut-off score of 51 points in GPS was chosen because this is the mean score for Spanish adult population (Díaz-Morales et al., 2006b). In our principal data analyses, we decided not to include the standard deviation for this score (*SD* = 11) because it would lead to excluding a large part of the sample, especially in the control group. However, in order to resolve any possible doubts stemming from this decision, we conducted the analyses as well with the standard deviation included and we compared the results of both procedures.

The exclusion criteria were the following: (a) organic mental disorder, brain dysfunction or mental retardation; (b) substantial visual, hearing, or cognitive deficits; and (c) substance abuse.

To form part of the control group, the students needed to report not having problems with procrastination and to score maximum 51 points in GPS. All the rest of the inclusion and exclusion criteria were the same as for the procrastination group.

In the data analyses, we decided not to use as cut-off score the standard deviation for the mentioned Spanish population mean score (*SD* = 11) because this would involve excluding a large part of the sample, especially in the control group.

3.1.2.2. Sample Characteristics. The principal demographic and clinical features of the sample along with the variables derived from the RGT are presented in Table 1. It was checked if the existing between-group disparities regarding the sociodemographic variables were significant. The results of this procedure are reported in section 4.1.

Table 1

Sociodemographic and Main Clinical and Cognitive Characteristics of the two Groups of Study 1

Variable	Procrastination (n = 67)	Control (n = 61)	Full sample (N = 128)
Age *M* (*SD*)	22.10 (2.17)	21.88 (2.19)	21.97 (2.19)
Gender *n* (%)			
Male	17 (25.4)	10 (16.4)	27 (21.1)
Female	50 (74.6)	51 (83.6)	101 (78.9)
Marital status *n* (%)			
Single	39 (58.22)	33 (54.1)	72 (56.2)
Married/ partnered	28 (41.8)	28 (45.9)	56 (43.8)
Education *n* (%)			
Primary	0 (0.0)	0 (0.0)	0 (0.0)
Secondary	48 (71.6)	39 (63.9)	87 (67.9)
Master/ doctoral	19 (28.4)	22 (36.1)	41 (32.1)
Previous psychological treatment *n* (%)			
Yes	29 (43.3)	21 (34.4)	50 (39.1)
No	38 (56.7)	40 (65.6)	78 (60.9)
Work at the same time as studies *n* (%)			
Yes	27 (40.3)	31 (50.8)	57 (44.5)
No	40 (59.7)	30 (49.2)	71 (55.5)
GPS *M* (*SD*)	72.63 (8.41)	40.90 (6.10)	57.51 (17.53)
AIP *M* (*SD*)	51.07 (9.26)	28.82 (7.76)	40.47 (14.05)
DPS *M* (*SD*)	17.55 (4.66)	10.88 (3.57)	14.37 (5.34)
DASS-21 *M* (*SD*)			
Depression	11.31 (10.25)	5.90 (6.70)	8.73 (9.12)
Anxiety	8.66 (8.78)	5.74 (7.25)	7.27 (8.19)
Stress	18.36 (9.40)	14.31 (8.94)	16.43 (9.37)

Variable	Procrastination (n = 67)	Control (n = 61)	Full sample (N = 128)
Total	38.33 (23.72)	26.36 (19.08)	32.62 (22.37)
CORE-OM *M* (*SD*)			
Well-being	1.65 (.86)	1.37 (.8)	1.52 (.84)
Problems	1.48 (.76)	1.10 (.7)	1.30 (.75)
Functioning	1.15 (.66)	.76 (.52)	.96 (62)
Risk	.15 (.26)	.14 (.36)	.15 (.31)
Total	1.15 (.62)	.84 (.52)	1.00 (.59)
Presence of IDs *n* (%)			
Yes	50 (74.6)	18 (29.5)	68 (53.1)
No	17 (24.6)	43 (70.5)	60 (46.9)
PICID *M* (*SD*)	1.06 (1.32)	.36 (.77)	.72 (1.15)
Discrepancies *M* (*SD*)			
Self now – ideal self	.38 (.11)	.25 (.09)	.31 (.12)
Self now – others	.32 (.08)	.28 (.07)	.30 (.08)
Ideal self – others	.31 (.07)	.29 (.07)	.30 (.07)
Cognitive polarization *M* (*SD*)	29.66 (11.85)	30.49 (12.30)	30.05 (12.02)
Interpersonal construct differentiation *M* (*SD*)	38.89 (9.46)	38.05 (8.74)	38.49 (9.10)

Note. GPS – General Procrastination Scale; AIP – Adult Inventory of Procrastination; DPS – Decisional Procrastination Scale; DASS-21 – Depression Anxiety Stress Scales—21; CORE-OM – Clinical Outcomes in Routine Evaluation – Outcome Measure; PICID – Percentage of Intensity of Constructs of Implicative Dilemmas.

3.1.3. Instruments

The three scales we used to measure procrastination are described in section 1.1.5. To avoid duplicity, we do not describe them here again.

In addition, we used two inventories to measure the level of psychological symptomatology and distress (DASS-21 and CORE-OM). Finally, the Repertory Grid Technique was administered in order to explore the cognitive structure and conflicts (including those regarding procrastination) of the participants. Apart from these instruments, we used as well a sociodemographic questionnaire to gather general information about the participants (see Annex 1).

3.1.3.1. Clinical Outcomes in Routine Evaluation – Outcome Measure. The CORE-OM (Evans et al., 2000; Feixas et al., 2012) is a self-administered questionnaire used to measure the level of psychological distress in adults, applied mostly to assess change during psychotherapy or counselling. It consists of 34 items that analyze respondents' state on four subscales: Well-being (four items assessing subjective well-being), Functioning (12 items assessing general functioning individually and interpersonally), Problems (12 items assessing psychological and somatic symptoms) and Risk (six items assessing the possibility of harming oneself or others). The respondents are asked to consider their state in the last week and score each item according to the frequency of suffering specific problems or symptoms. There are five possible answers regarding this frequency: "not at all" (0 points), "only occasionally" (1), "sometimes" (2), "often" (3), "most of the time" (4). The scores are summed up and divided by the number of questions in each scale, in total, and in total without the Risk scale. Hence, the lower the score, the lower the level of symptoms and the higher the level of well-being of the respondent. The original version of the measure showed a high level of convergent validity and viability (Evans et al., 2000; Evans et al., 2002). In the present study, we used the Spanish version of this questionnaire (Feixas et al., 2012) which is characterized by good psychometric properties, showing a reliability between Cronbach's $\alpha = .71$ and $\alpha = .94$ across the scales (Trujillo et al, 2016).

3.1.3.2. Depression Anxiety Stress Scales—21. The DASS-21 (Lovibond & Lovibond, 1995) is a self-administered questionnaire created to measure the level of core symptoms of depression, anxiety, and stress. The main version of DASS consists of 42 items, but we decided to

use the shorter one, DASS-21, because in the Spanish validation study it provided better psychometric properties (Bados et al., 2005). It has seven items per scale and uses a 4-point severity scale. The Depression scale measures dysphoria, hopelessness, life devaluation, depreciation of self, lack of interest/involvement, anhedonia, and inertia. The Anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. Finally, the Stress scale measures relaxing difficulty, nervous arousal, as well as getting easily upset, agitated, irritable, impatient, and over-reacting. Answering choices are "never" (0 points), "sometimes" (1), often (2), and "almost always" (3). The respondents are asked to consider their state in the last week. Cut-off scores were developed for each scale to define the severity of the symptoms as normal (0-9 points), light (10-13), moderate (14-20), severe (21-27), or extremely severe (28 and more points). Concurrent validity of DASS was confirmed by comparing it to Beck's depression and anxiety inventories (Lovibond & Lovibond, 1995). Scores obtained in DASS-21 need to be multiplied by two to calculate the final score. We administered the Spanish version of the questionnaire (Bados et al., 2005).

3.1.3.3. Repertory Grid Technique. RGT was created originally by Kelly (1955/1991) and later developed further by other researchers (Feixas & Cornejo, 2002; Fransella et al., 2004; Jankowicz, 2003). As we mentioned briefly in section 1.2.2.2., instead of being a typical, preestablished self-report questionnaire, RGT is a semistructured interview designed to elicit the personal constructs of respondents and thus be able to analyze their cognitive structure and conflicts. Over the years, the RGT has been used in many areas of research, assessment, and intervention such as clinical, organizational, developmental, and educational psychology, marketing, information systems, criminology, or anthropology (e.g., Bell, 2003; Curtis et al., 2008; Feixas & Botella, 2003; Walker & Winter, 2007). It has taken many forms as well (for an account of these, see Caputi et al., 2012), out of which our research group uses the interpersonal one proposed by Feixas and Cornejo (2002). This RGT has shown good test-retest reliability for the elicitation of

elements (71-77%) and constructs (47.7-68%), whereas the stability of the measures obtained with the RGT varies between .61 and .85 (Feixas et al., 1992; see Feixas & Cornejo, 2002, for a review).

The administration of this RGT procedure was carried out by trained interviewers who briefly explained to each participant the consecutive steps to be taken to administer it (for an example of a complete grid form, see Figure 1 below). Next, the person conducting the interview asked the participant to enumerate some significant people in their life. These people are called "elements" in the RGT and are being logged manually in the columns of the grid form. The list must include the "self now", some important family members (especially parents and siblings), present partner (and/or past significant partners if the participant wished to include them), friends, other significant people (if the participant wishes to add them), one *non grata* person (somebody whom the participant would not like to be alike), and, finally, the "ideal self" (how the participant would like to be, ideally). The minimum number of elements recommended is ten (Feixas & Botella, 2003), but the respondents usually elicit a few more elements.

Figure 1

Grid Form Completed by one of the Participants of the Study (Translated From Spanish by the Author)

Name:_____

Date: _____

				SELF NOW	FATHER	MOTHER	SISTER	PARTNER	FRIEND 1	FRIEND 2	FRIEND 3	NON GRATA	IDEAL SELF									
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	curious	1	without interest	1	2	2	1	3	3	4	2	4	1										
2	funny	2	boring	2	1	2	2	3	2	3	2	5	2										
3	creative	3	non-imaginative	3	3	2	3	3	4	5	5	5	1										
4	affectionate	4	cold	3	5	1	3	2	1	1	4	6	1										
5	organized	5	disorganized	6	3	2	1	2	1	2	5	4	2										
6	character	6	relaxed	6	7	2	2	6	6	3	7	4	3										
7	optimist	7	pessimist	6	6	3	3	3	2	3	1	4	1										
8	open	8	closed	5	1	1	2	3	1	4	1	3	1										
9	cares about people	9	uncaring	5	5	2	4	5	1	1	6	6	2										
10	responsible	10	irresponsible	5	3	2	2	2	3	1	7	4	2										
11	party girl	11	not a party girl	6	3	3	6	5	1	5	2	1	3										
12	patient	12	irritable	3	3	6	6	2	2	2	2	4	2										
13	good person	13	bad person	3	3	2	3	3	2	1	2	7	1										
14	leaves it all to the last mon	14	does it on time	1	6	6	7	5	7	7	3	4	7										
15	happy	15	sad	2	2	2	2	2	3	3	1	2	1										
16		16																					
17		17																					
18		18																					
19		19																					
20		20																					

1. Very **2.** Quite **3**. A bit **4**. Middle point **5**. A bit **6**. Quite **7**. Very

The following step consists of eliciting bipolar personal constructs. For that purpose, participants are guided to compare the obtained elements between them regarding their personal characteristics (such as their character, values etc., avoiding physical aspects). We used the dyadic method which consists of comparing the elements in pairs. For example, the participant is asked about a similarity between them and their mother. Let us assume that the spontaneous answer is "well-organized". This answer becomes the left pole of the construct, known as well as the emergent pole. Then, the participant is asked to name the opposite of the elicited pole, for example "disorganized" which becomes the right pole of the construct. Personal constructs are expressed preferably in form of adjectives, but nouns and descriptive forms are allowed as well. The interviewee is asked both about similarities and differences between the elements. This procedure continues with dyadic comparisons between the participant and other elements, and between the

other elements until the so-called point of saturation, where the respondent is not able to elicit any more constructs. Sometimes, two or more constructs may be elicited from the same dyad, especially if it is a significant one (such as mother/father or self now/partner). Both poles of each construct are noted down in the rows of the grid form. Should the participant repeat a construct that has been elicited already, it is not included twice. Here again, the minimum number of constructs is ten, but respondents elicit usually from 15 to 25 constructs.

For the sake of our study, two constructs were added by the interviewer when the point of saturation was reached if they had not been elicited spontaneously before. Obviously, the first one regarded procrastination. In order to elicit it, the interviewer would suggest the left pole in a descriptive form of "leaves everything until the last moment" and the participant was asked to define the opposite pole. We chose this descriptive form because the word "procrastination" and its forms in Spanish and Catalan are not universally known. Hence, we thought that it was best to avoid any possible misunderstandings and provide a clear description of the procrastinatory behavior. The second construct provided by the interviewer regarded level of happiness. The proposed pole was simply "happy" and the interviewee had to provide the opposite. The procedure of adding external constructs in specific research projects is a well-known practice in PCT-related research (Compañ et al., 2011; Walker & Winter, 2007)

The third and final step in the administration of the RGT is to assign a score to each person on each construct. Various scoring systems have been used in the history of the RGT (Caputi et al., 2012). Our research group opts for a 7-point Likert scale, with 4 as the middle point, chosen if the participant cannot decide if the person is more like the left or the right pole of the construct. Scores towards 1 denote that the element is rated on the left pole (1-very much like the left pole, 2-quite, 3-slightly), whereas scores toward 7 mean the element is perceived according to the right pole (5-slightly like the right pole, 6-quite, 7-very much). The scoring procedure starts usually with the interviewer asking the participant to score each element on each construct and the interviewer

writing down the scores in the rows of the grid form. After a few constructs being scored, the participants may continue with filling in the form themselves, as long as they feel confident to do it.

The whole procedure usually takes about an hour. After the scoring is completed, we obtain a matrix of ratings that needs to be introduced to a specific software program (we used RECORD/GRIDCOR 6.0; Garcia-Gutierrez & Feixas, 2018) which analyzes the obtained information automatically and provides the researcher with various indexes regarding participants' cognitive structure and conflicts. In the present studies we analyzed the following variables:

3.1.3.6.1. Cognitive Conflict Measures. As we mentioned in section 1.2.2.2., various types of CCs are derived from the RGT analysis (Feixas et al., 2009). In this research we focus specifically on one of them – the IDs because only this type of CC has a sufficient empirical base and has consistently shown its relevance in the study of psychological and somatic problems.

Originally, DCs were included in the study of CCs (Dada et al., 2012; Feixas et al., 2009; Saúl, 2005). This type of conflict is detected when the respondent assigns a midpoint rating (4, in a 7-point Likert scale) to his or her "ideal self" on a given construct, thus not choosing any of the poles, possibly because both are perceived as undesirable. In our opinion this situation reflects a dilemma because the respondent does not seem to have a clear course of action regarding the choice between the two conflicting poles of the construct (Feixas & Saúl, 2004). Another possible view on this situation is the one of Winter and colleagues (2010) who claim that selecting a midpoint rating may be a conscious choice and means actually wanting to be exactly in the middle, between the two extremes of the construct. However, we believe that as this middle ground is not defined or constructed yet, DCs point to a certain area that needs further elaboration. An example of a DC in the case of one of the participants of our studies was the construct "dreamer vs. realist" in which the "self now" was rated with a 6, meaning that the participant defined herself as quite a realist, but as her score of 4 in the "ideal self" indicates, she would prefer to stay in the middle ground (a) –

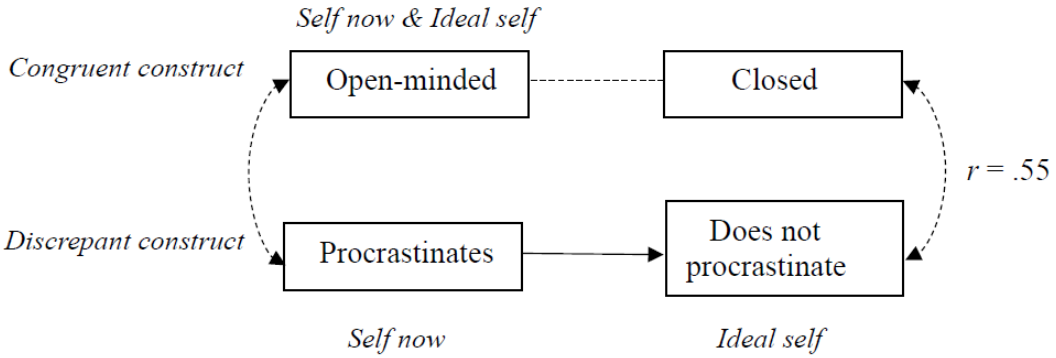
neither a dreamer, nor a realist. Studies including DCs so far provide no clear evidence of its construct validity or capacity to discriminate between clinical and control groups.

IDs are characterized by a more complex structure than DCs. They consist of two constructs that correlate with each other. One is a **congruent construct**, meaning that the person's "self now" is coherent with their "ideal self" – they are rated on the same pole and the ratings are either the same or there is a difference of one point only. Hence, the person does not want or need to make any change in this construct. The second part of the dilemma is a **discrepant construct** in which the "ideal self" is rated at the opposite pole to the "self now" (four or more points of difference between their ratings). Thus, the person wishes to make a change in this construct by abandoning the present, undesired pole and becoming more like their "ideal self", defined on the opposite pole.

This pair of constructs becomes an ID when there is a correlation equal or higher than .35 so that the undesired pole of the congruent construct correlates with the desired pole of the discrepant construct. In other words, a desired change in the discrepant construct would imply losing coherence in the congruent construct which often expresses a feature important to person's identity. Therefore, we call these dilemmas implicative ones. As we can see, in such a situation a CC is created and the change is blocked despite the person's wish for it. What is more, one congruent construct may correlate with various discrepant ones and vice versa which creates structures called "macro-dilemmas" that may make the desired change even more difficult to obtain. An example of and ID is presented in Figure 2 below. For this participant, people who do not procrastinate are construed as being also closed in their minds. Therefore, this implication generates a dilemma because overcoming procrastination would also involve un undesired consequence for his personal identity.

Figure 2

Example of an Implicative Dilemma Detected in the Grid Data of one of the Participants of Study 1



In the studies of this thesis, we focused on two RGT indexes related to IDs: their presence measured by a categorical frequency variable (having at least one ID versus not having them) and their number measured by the Percentage of Intensity of Constructs of Implicative Dilemmas (PICID). Until recently IDs number was measured in MDP research by Percentage of Implicative Dilemmas (PID). This index takes into account the grid's size (it needs to be done because the more constructs elicited in the interview, the higher the possibility of IDs' appearance), but has the drawback of not taking into consideration the intensity (strength) of correlations between constructs forming part of IDs. The recently created (Rouco et al., 2019) PICID includes this feature and can better reflect IDs' importance for the person because the higher the correlation the more intense or difficult to solve may be the dilemma. Therefore, we decided to opt for this index. When predicting major depression, PICID showed to be equally effective as PID (Rouco et al., 2019). Equation 2 presents the formula for calculating PICID, where "*n*" represents the number of constructs in the Grid and "*r*" stands for the Pearson correlation involved in the IDs.

$$PICID = \frac{\sqrt{\sum r^2}}{\left({}^{n!}/_{2[(n-2)!]}\right)} \times 100 \qquad (2)$$

3.1.3.6.2. Self-Discrepancies. These indexes allow analyzing how similar or different from their "ideal self" and from "others" the participants see themselves, as well as how similar other people are regarding participant's "ideal self". Whereas the elements "self now" and "ideal self" always form part of the RGT, the element "others" is computed afterwards automatically by the software. It includes ratings of all the elements apart from the "self now" and "ideal self", that is, all significant people included in the grid. Hence, these people are thought to be the representation of the more generalized "others" within respondents' subjective construction of reality.

With the aim of assessing these dissimilarities, Euclidian distances (*D*) are calculated. These are obtained by calculating the differences between the rating of these three elements. A standardization is applied for the results, so that the outcome is not influenced by the number of constructs in the grid. Therefore, the distance range varies from 0 (no discrepancy at all) to 1 (maximum possible discrepancy). The equation (5; Corella, 2012) used to calculate the Euclidian distance for the self now – ideal self discrepancy is presented below.

$$D = \frac{\sum_0^c (S-I)^2}{6\sqrt{C}} \tag{5}$$

In the formula, S stands for the self now, I for the "ideal self", and C for the number of constructs in the grid. Number 6 represents the maximum possible distance between the elements, taking into consideration the 7-point Likert scale used by our research group. Trujillo (2016) found in the community sample of her study, means for the three measures: *M* = .23 (*SD* = .09) for the self now – ideal self, *M* = .21 (*SD* = .06) for the self now – others, and *M* = .22 (*SD* = .06) for the ideal self – others discrepancies.

The Euclidian distances may be interpreted as measures of self-esteem (self now – ideal self discrepancy), self-perceived isolation (self now – others) or identification with others for low distances, and perceived adequacy of others (ideal self – others). As a matter of fact, Dada (2008)

found a high correlation between the self now – ideal self discrepancy and self-esteem as measured by the Rosenberg Self-Esteem Scale (1985). For reading purposes, we refer to the discrepancies as self – ideal, self – others, and ideal – others, respectively.

3.1.3.6.3. Cognitive Polarization. This index is obtained by calculating the percentage of extreme scores (i.e., 1 and 7) in the whole grid data matrix. Purely mathematical probability of both extreme scores together yields a figure of 28.57% of all possible ratings. Trujillo (2016) found in her community sample have a similar mean score of polarization – 28.11 (*SD* = 15.79). Taking these values as a reference, it is thought that scores significantly higher than 28.11 or 28.57 indicate cognitive rigidity and dichotomous thinking or, in other words, seeing the world only in black and white. Studies in which the RGT was used show that high cognitive polarization is associated with certain psychological and psychosomatic disorders (Aguilera et al., 2019; Benasayag et al., 2003; Feixas et al., 2010; García-Mieres, Montesano et al., 2020), these results being in accordance with Bonarius' view (as cited in Hardison & Neimeyer, 2012), this index's proponent, who claimed that extreme ratings reflect a joint function of the meaningfulness of constructs and elements and could be a sign of psychopathology.

Polarization is calculated as well for individual constructs and elements. In this case, the score on polarization may be interpreted as indicating the level of meaningfulness each construct and element have for the respondent (Winter, 1992). In our analysis, we included the polarization score on the procrastination construct.

3.1.3.6.4. Interpersonal Construct Differentiation. This index is a measure of cognitive complexity, a notion widely used and researched within the PCT. It was put forward initially by Bieri (1955) as a structural characteristic of the personal construct system. Many definitions and measurement methods of cognitive complexity have been proposed since (for a review of these, see Kovářová & Filip, 2015). We follow the model of Adams-Webber (1979) who claimed that

cognitive complexity consisted of two dimensions – differentiation and integration. This definition has been widely accepted and followed in PCT-related research.

According to Fransella et al. (2004) differentiation means having the capability of using various, independent cognitive dimensions when considering elements (e.g., people) or being able to discriminate in detail between these dimensions. When it goes to integration, it reflects a situation in which various subordinate constructs are subdued under superordinate constructs, the latter giving unity to the whole construct system (Neimeyer et al., 1983). In their review, Kovářová & Filip (2015) conclude that none of the indexes proposed to measure integration assessed it independently from differentiation. That is why we opt for analyzing solely the latter which seems to be a more robust measure, leaving less space for doubt regarding its validity (Kovářová & Filip, 2015).

Interpersonal construct differentiation is measured by the Percentage of Variance Accounted by the First Factor (PVAFF; Bonarius, 1965) which results from the principal component analysis of the grid data matrix. It indicates the percentage occupied by one dominant dimension of meanings expressed in the grid. Trujillo (2016) found a mean of 42.93 (*SD* = 11.88) for the PVAFF of her community sample. Hence, scores higher than that may indicate a unidimensional construing of reality, a sign of low cognitive differentiation. On the other hand, scores lower than the community mean may be a sign of multidimensional construing, a sign of higher cognitive complexity via differentiation. Such people tend to use various, independent dimensions of construing, being able to operate on many different constructs when trying to make sense of reality. In general, low cognitive differentiation appearing together with high polarization is interpreted as cognitive rigidity (e.g., Aguilera et al., 2019, Soldevilla et al., 2014). Additionally, it was found that whereas high cognitive differentiation was related to metacognitive abilities, low differentiation correlated with social withdrawal and mediated the impact of self-reflexivity and neurocognitive deficits on negative symptoms in psychosis (García-Mieres, Villaplana et al., 2020).

3.1.3.4. Sociodemographic Questionnaire. We created an additional document in order to gather basic data regarding participants' demographics, psychotherapy they were receiving in the time of assessment or had received in the past, potential substance abuse, and level of life satisfaction.

3.1.5. Procedure

Study 1 was conducted after its protocol was accepted by the Bioethics Committee of the *Universitat de Barcelona*. When it goes to gathering the sample, 30 participants from the procrastination group were recruited between 2013 and 2014 within our previous study. The other 98 participants (37 from the procrastination group and all 61 from the control one) were recruited entirely for Study 1 between 2016 and 2021. Call for participants was announced in person by the investigators from our research group among students of the Faculty of Psychology and disseminated by the latter to their friends and acquaintances from other faculties and universities in the Barcelona area. The call was advertised as well on posters placed in various buildings of the *Universitat de Barcelona* and on the Internet.

Students interested in participating in the study contacted the undersigned PhD candidate via email and, after initial scanning for the inclusion and exclusion criteria (only two students were excluded because of their age), an assessment session was scheduled. The assessment sessions were conducted by the PhD candidate in the Psychotherapy Lab of the Faculty of Psychology in a bright room, equipped with desks and chairs, and designed especially for therapy and assessment purposes.

At the beginning of the assessment session, all the relevant details of the study were explained to the participants. Then an identification number was assigned to each of them and they were asked to sign the informed consent (so did the investigator) and fill in the sociodemographic and, subsequently, all the questionnaires mentioned above. Finally, the RGT interview was conducted by the investigator and the constructs in the Repertory Grid were scored by the

participant. In total, the assessment session lasted about two hours. A few weeks later, when the data was analyzed by the investigator, the students were contacted again to schedule a feedback session. In this session, they were informed about the results of the questionnaires and got information regarding their cognitive structure and conflicts extracted from the RGT.

3.1.6. Data Analyses

Data analyses included the results of 128 participants who completed the assessment. For analyzing the data extracted from the RGT we used RECORD/GRIDCOR 6.0 (Garcia-Gutierrez & Feixas, 2018). Further analyses of RGT data and all the other analyses were performed using IBM SPSS Statistics (Version 26) and JASP (Version 0.14.1).

Normality checks were run for each outcome measure separately (PICID, DASS-21 total score and its subscales, CORE-OM total score as well as its subscales, self – ideal, self – others, ideal – others discrepancies, cognitive polarization, and interpersonal construct differentiation) in the two samples of Study 1 (procrastination and control group). Histograms, boxplots, and Q-Q plots were visually assessed, alike the results of Shapiro-Wilk test, as recommended in the literature (Ghasemi & Zahediasl, 2012; Mohd Razali & Yap, 2011).

Results suggested that the majority of outcome variables were not normally distributed. In the light of these results, the use of parametric methods may be questioned. Nonetheless, parametric methods have been shown to be robust even with non-normally distributed variables (Norman, 2010). All outliers were graphically explored (e.g., boxplots, histograms, scatterplots). Since it was not possible to decide if they were a product of measurement errors or real phenomena and the sample size was limited, analyses were conducted including outliers.

Considering the given information both parametric and nonparametric statistics were employed in the analyses. Moreover, statistical corrections were applied to parametric tests when adjusting any violation of their assumptions was needed. Results of both parametric and non-

parametric tests were provided except situations when distributions were normal and assumptions were met.

The statistical analyses applied to test the hypotheses of Study 1 are presented in Table 2 below. Prior to running the analyses described in the table, between-group differences regarding sociodemographic variables of the Study were explored. Chi-square tests for categorical variables and independent samples *t*-tests were run for this aim.

Table 2

Statistical Analyses Applied for Testing the Hypotheses of Study 1

Hypothesis	Analysis conducted
H1.1. We expected to find a higher presence as well as number and intensity of IDs in students who procrastinate in comparison to those who do not do it.	Parametric analyses: Independent samples *t*-test with Welch's correction for IDs' number and intensity. Non-parametric analyses: Chi-square test and odds ratio for IDs' presence; Mann-Whitney *U* test for IDs' number and intensity.
H1.2. We expected to find that students who procrastinate present more clinical symptomatology than those who do not do it.	Parametric analyses: Multivariate analysis of variance (MANOVA) and independent samples *t*-test with Welch correction for symptomatology differences; Two-way analysis of variance (ANOVA) for interaction effects between presence of IDs and both conditions on procrastination and clinical symptoms. Non-parametric analyses: Mann-Whitney *U* test for symptomatology differences.
H1.3. We expected to find that students who procrastinate have a more negative vision of themselves than those who do not do it.	Parametric analyses: Independent samples *t*-test for self – ideal discrepancy. Non-parametric analysis: Mann-Whitney *U* test for self – ideal discrepancy.
Additional analyses	Parametric analyses: Independent samples *t*-test for the remaining RGT variables differences; Logistic regression for variables predicting belonging to procrastination group. Non-parametric analysis: Mann-Whitney *U* test for the difference in interpersonal construct differentiation.

Since we carried out some multiple comparisons, Bonferroni correction was used when necessary. In each such case we informed about the corrected alfa value used to contrast the obtained results. In both studies, effects sizes (ES) were provided for the results. Cohen's *d* was

used for parametric analyses of mean differences (calculated using independent and paired samples *t* tests) and rank biserial correlation (r_{rb}) for the non-parametric ones (calculated with Mann-Whitney *U* and Wilcoxon signed-rank test). For chi-square tests *phi* (φ) coefficient and odds ratio were used. In Study 2, the chi-square tests needed to be complemented by Fisher's exact tests. Partial *Eta* squared (η_p^2) was employed for ANOVA, MANOVA, and RM MANOVA, whereas odds ratio expressed in the exponentiation of the *B* coefficient was used for logistic regression. For the purpose of calculating correlations' strength, we used point biserial correlation (r_{pb}) and Spearman's *rho*. All the ESs were interpreted according to the criteria proposed by Cohen (1988).

3.1.7. Ethical Concerns

All individuals interested in participating in Study 1 were informed about the characteristics of the study. They learned that their participation was voluntary and no financial compensation was offered. The description of the study was presented orally and in an information sheet including their right to access, delete, or modify their data in the context of the study, as well as to abandon the study at any point. After being informed, all participants accepted and signed the informed consent. All paper-based data collected in the study was securely stored in a key-protected closet to which only the investigators of the study had access. The digital data was stored securely as well, so that only the study's investigators could access it. Participants' data were anonymized, with an alphanumeric code assigned to each of them. The research project was approved by the Bioethics Committee of the *Universitat de Barcelona*.

3.2. Study 2

3.2.1. Design

Study 2 derives from another study of ours that was a randomized controlled trial. It consisted of two groups and was aimed at testing the efficacy of two ultra-brief treatments of procrastination.The experimental condition was a cognitive constructivist intervention, whereas the

control one consisted of cognitive behavioral therapy. We conducted the original study as a master's thesis project at the *Universitat de Barcelona*. The sampling method in that study was a convenience non-probability one. In consequence, the same method was used in the present study.

As there was no statistically significant differences in the efficacy of both treatments, and the sample was relatively small, in the present study, following the aforementioned objectives, we decided to merge the two groups and to analyze the change in cognitive structure and clinical symptoms after receiving treatment in the whole sample, without differentiating between the type of intervention. Therefore, in Study 2 of the present thesis, all participants who received treatment are considered as in one group receiving cognitive therapy, regardless of whether the interventions were initially planned as cognitive constructivist or cognitive behavioral. The objective of this study was to analyze the change in cognitive structure and its relation to the possible reduction in the clinical symptoms after receiving treatment.

3.2.2. Participants

Study 2 included 28 participants from our previous study. All of them were students from various universities in Barcelona. For the purposes of this project, we used specific inclusion and exclusion criteria.

3.2.2.1. Inclusion and Exclusion Criteria. The inclusion criteria for Study 2 were the following: (a) being a student at the time of assessment; (b) age between 19 and 26 years; (c) report procrastination as a problem and score above 51 points in GPS; (d) having the procrastination construct scored in the RGT (Kelly, 1955/1991); (e) having completed both the pre- and post-treatment RGT; (f) having attended all sessions constituting the intervention.

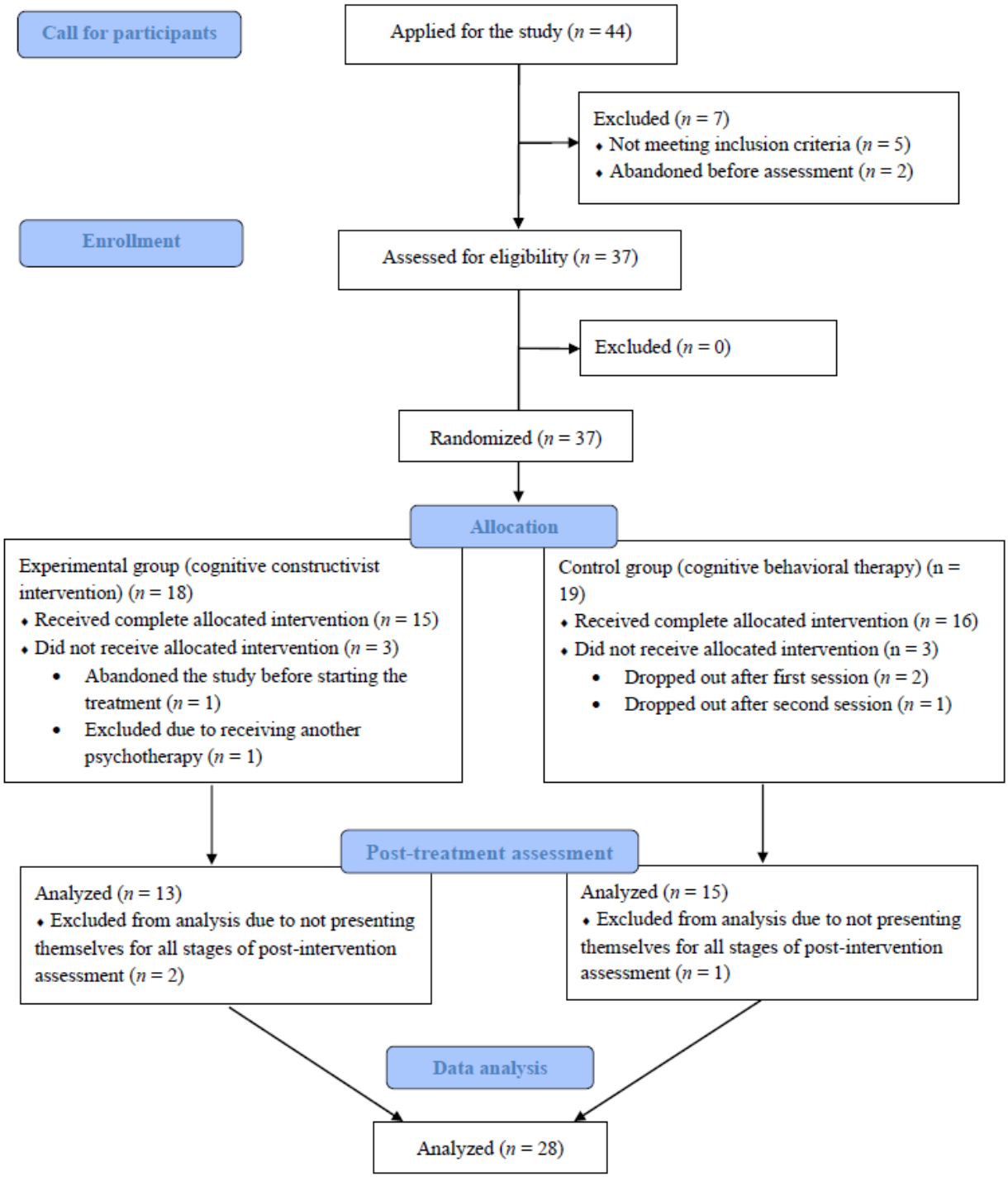
Potential participants were excluded if they: (a) were currently under psychological treatment; (b) had been diagnosed lately with any mental disorder; (c) abused drugs or alcohol; (d) presented psychotic symptoms; (e) had an organic mental disorder, brain dysfunction or mental retardation; or (f) had substantial visual, hearing, or cognitive deficit.

As we mentioned above, in the present study we merged the two groups from the randomized controlled trial and treated them as one sample of students receiving cognitive brief psychotherapy for procrastination. Out of the 31 participants of the original study, three did not complete the post-treatment RGT. That is why in Study 2 we analyzed only the data of the 28 eligible participants in total.

Figure 3 shows in detail the flow of participants in Study 2.

Figure 3

Participants' Flow Diagram of Study 2



3.2.2.2. Sample Characteristics. The principal demographic and clinical features of the sample along with the variables derived from the RGT are presented in Table 3.

Table 3

Sociodemographic and Main Clinical and Cognitive Characteristics of Participants of Study 2 at Baseline

Variable	Full sample (procrastination) (*N* = 28)
Age *M* (*SD*)	22.57 (2.08)
Gender *n* (%)	
Male	9 (32.1)
Female	19 (67.9)
Marital status *n* (%)	
Single	14 (50.0)
Married/ partnered	14 (50.0)
Education *n* (%)	
Primary	0 (0.0)
Undergraduate	16 (57.1)
Master/ doctoral	12 (42.9)
Previous psychological treatment *n* (%)	
Yes	8 (28.6)
No	20 (71.4)
Work at the same time as studies *n* (%)	
Yes	14 (50.0)
No	14 (50.0)
GPS *M* (*SD*)	73.90 (8.73)
AIP *M* (*SD*)	55.80 (7.36)

Variable	Full sample (procrastination) (N = 28)
DPS *M* (*SD*)	17.30 (4.88)
DASS-21 *M* (*SD*)	
Depression	11.20 (11.55)
Anxiety	8.00 (8.99)
Stress	17.60 (8.83)
Total	36.90 (25.79)
CORE-OM *M* (*SD*)	
Well-being	1.45 (.92)
Problems	1.36 (.9)
Functioning	1.14 (.65)
Risk	.21 (.36)
Total	1.13 (.76)
Presence of IDs *n* (%)	
Yes	23 (82.1)
No	5 (17.9)
PICID *M* (*SD*)	1.16 (1.06)
Discrepancies *M* (*SD*)	
Self now – ideal self	.40 (.12)
Self now – others	.33 (.08)
Ideal self – others	.32 (.08)
Cognitive polarization *M* (*SD*)	29.60 (10.75)
Interpersonal construct differentiation *M* (*SD*)	41.80 (8.84)

Note. GPS – General Procrastination Scale; AIP – Adult Inventory of Procrastination; DPS – Decisional Procrastination Scale; DASS-21 – Depression Anxiety Stress Scales—21; CORE-OM – Clinical Outcomes in Routine Evaluation – Outcome Measure; PICID – Percentage of Intensity of Constructs of Implicative Dilemmas.

3.2.3. Instruments

In this study we used the same questionnaires as in Study 1 (described in sections 1.1.5 and 3.1.3.), with the sole difference of them being administered twice: before and after the treatment. To avoid duplicity, they are not described here again.

3.2.4. Intervention

In the original study, we created specific treatment manuals for both (cognitive constructivist and cognitive behavioral) brief interventions. One therapist, trained in the cognitive constructivist model, conducted the treatment in this condition whereas another one, trained in CBT, conducted the therapy in this approach. Both were supervised by two experienced clinicians, specialized in the respective approaches. As said, in this study we do not distinguish among these two types of intervention and emphasize its common cognitive base.

3.2.5. Procedure

The original study was conducted after its protocol was accepted by the ethics board of the *Universitat de Barcelona*. Participants for both samples were recruited in late 2013 and early 2014. An offer of free psychotherapy for students who believed that procrastination was a problem for them was announced through posters at various university campuses in Barcelona and on the Internet. Interested students contacted the study coordinator via email or phone. A total of 44 students applied for the study but five of them had to be excluded due to not meeting the inclusion criteria. Moreover, two students abandoned the study before the initial assessment. When it goes to the remaining 37 students, an assessment session with a voluntary evaluator (a graduate student collaborating with our research group) was programmed. Therapists did not conduct the evaluation sessions, so that the independence between assessment and treatment was ensured.

In the assessment session, participants signed an informed consent and an identification number was assigned to each of them. They were asked to fill in the sociodemographic questionnaire, and if they fulfilled all the inclusion criteria, they completed all the above-mentioned

questionnaires. The participants were then informed that if they passed to the treatment stage of the study, they would by contacted to schedule the first session.

After random group assignment (conducted using graphpad.com software), each therapist contacted the assigned participants. In the first session the students were informed about the assigned treatment and its characteristics (the condition was not blind to the participants). The participants received three one-hour, weekly sessions and then one booster session five to seven weeks after the third session. In this last session, therapists offered a personalized feedback and future recommendations to the students. 31 students attended all the four sessions. Out of the remaining five, one abandoned the study before starting the treatment, one was excluded due to receiving another psychotherapy simultaneously, two dropped out after the first session and one did it after the second one. Post-treatment evaluation took place one week after the fourth session. It involved completing all the questionnaires included in the pre-treatment assessment, following the same procedure. In total, the time span between the two assessment sessions was between nine to eleven weeks. Three students did not present themselves for the post-treatment evaluation. Only the 28 participants who attended the four sessions and completed both assessments were included in the present study.

The study took place in the buildings of the of the Faculty of Psychology of the *Universitat de Barcelona*. Both evaluation and therapy sessions were conducted in three rooms, all of them bright, with natural light, equipped with desks and chairs. All the sessions were recorded in audio.

3.2.6. Data analyses

The 28 participants who entered the study also participated in all therapy and assessment sessions, so that we had no missing data. For analyzing the data extracted from the RGT we used RECORD/GRIDCOR 6.0 (Garcia-Gutierrez & Feixas, 2018). Further analyses of RGT data and all the other analyses were performed using IBM SPSS Statistics (Version 26) and JASP (Version 0.14.1).

Normality checks were conducted separately for the outcome measures (GPS, AIP, DPS, PICID, DASS-21 total score and its subscales, CORE-OM total score as well as its subscales) in the two assessment points (pre- and post-therapeutic intervention). Histograms, boxplots, and Q-Q plots were visually inspected, as well as the results of Shapiro-Wilk test. Results suggested that, similarly to Study 1, most outcome variables were not normally distributed. Here again, the use of parametric methods may be questioned. All outliers were graphically explored (e.g., boxplots, histograms, scatterplots). It was not possible to decide whether the outliers in the data were a product of measurement errors or real phenomena, and sample size was limited. Therefore, the analyses were conducted including these outliers.

Considering given information both parametric and non-parametric statistics were employed in the analyses. Results of both parametric and non-parametric tests were provided except for situations when distributions were normal and assumptions were met.

The statistical analyses applied to test the hypotheses of Study 2 are presented in Table 4 below.

Table 4

Statistical Analyses Applied for Testing the Hypotheses of Study 2

Hypothesis	Analysis conducted
H2.1. We expected to find that the brief cognitive therapeutic intervention would produce a decrease in the level of procrastination and reduce the intensity of clinical symptoms.	Parametric analyses: One-way repeated measures multivariate analysis of variance (RM-MANOVA) and paired samples *t*-test. Non-parametric analyses: Wilcoxon signed-rank test.
H2.2. We expected that students with procrastination would experience a decrease in the presence as well as number and intensity of IDs after participating in a brief cognitive therapeutic intervention.	Parametric analyses: Paired samples *t*-test for the number of IDs. Non-parametric analyses: Chi-square test and Fisher's exact test for the number of participants with at least one IDs.
H2.3. We expected to find that the possible decrease of the number and intensity of IDs would correlate with the decrease of the intensity of clinical symptoms.	Parametric analysis: Pearson correlation. Non-parametric analysis: Spearman correlation.
H2.4. We expected to find that the participants who resolved their IDs after the therapeutic intervention would decrease their level of procrastination more than those who did not resolve their IDs.	Parametric analyses: Independent samples *t*-test Non-parametric analysis: Mann-Whitney *U* test.
Additional analyses	Parametric analyses: Paired samples *t*-test

3.2.7. Ethical concerns

All individuals that showed interest in Study 2 were informed about the features of the research project. This description was included in an information sheet in which it was expressed that the study was voluntary and no compensation was offered, apart from getting the possible positive effects from the treatment received. Participants were informed as well about their possibility to access, modify, or delete their data, and about the possibility of abandoning the study if they wished to do so. After being informed, all participants who fulfilled the inclusion criteria accepted and signed the informed consent.

Therapists who delivered the interventions and graduate students who conducted the assessment sessions were asked as well to sign a confidentiality agreement regarding personal data of the participants. All paper-based data produced during the study was securely stored in key-protected closets. Only the investigators participating in the study had access to this data. It was as well the case with all digital data stemming from the study that was securely stored. Participants' data were anonymized and an alphanumeric code was assigned to each of them.

The original research project providing the sample of Study 2 was approved by the Bioethics Committee of the *Universitat de Barcelona*. The study was registered at ClnicalTrials.gov (NCT02058797).

4. Results

The first results reported are the analyses of sociodemographic differences among the procrastination and control group of Study 1. The subsequent results of Studies 1 and 2 are presented according to the order of hypotheses enumerated in section 2.2. Complementary results are presented as well. Moreover, we always tested the assumptions for statistical analyses and reported their results.

4.1. Between-Group Sociodemographic Differences in Study 1

In order to verify the homogeneity on sociodemographic variables between procrastination and control groups preliminary analyses were conducted. There was no difference neither in age, $t(126) = -0,57$, $p = 0.571$ nor in completed studies level, $t(126) = 0.93$, $p = 0.354$. A series of chi-square tests were carried to verify differences in categorical data. There was no difference in gender, $\chi^2(1) = 1.55$, $p = .214$; relationship status, $\chi^2(1) = 0.22$, $p = .64$; work status, $\chi^2(1) = 1.02$, $p = .313$, and presence of previous psychotherapeutic treatment, $\chi^2(1) = 1.05$, $p = .305$. Based on these results, there were no sociodemographic variables which should be taken into consideration for additional controlling in the analyses.

When it goes to outcome measures, significant differences were expected. All of them are reported in section 4.2. according to the hypotheses to which they relate.

4.2. Results of Study 1

4.2.1. Differences in Frequency, Number, and Intensity of Implicative Dilemmas

A chi-square test for association was conducted between presence of IDs and procrastination. All expected cell frequencies were greater than five. There was a statistically significant association between presence of IDs and procrastination, $\chi^2(1) = 26.10$, $p = < .001$. The association was moderately strong, $\varphi = .45$. Based on adjusted standardized residuals reported

in Table 5, presence of IDs was associated with participants in procrastination group. It can be seen that three out of four procrastinators presented IDs, whereas this proportion was almost inverse in the control group where only 29,5% participants presented this CC.

Table 5

Presence of Implicative Dilemmas in Procrastination and Control Groups

		Presence of at least one implicative dilemma	
		No	Yes
Procrastination	*n*	17	50
	row %	25.40	74.60
		(-5.1)	(5.1)
Control	*n*	43	18
	row %	70.50	29.50
		(5.1)	(-5.1)

Note. Adjusted standardized residuals are reported in parentheses.

Odds ratio for ID presence was calculated as well (OR = 7.03; 95% CI: 3.23–15.30), indicating that procrastinators were seven times more likely to present at least one ID in comparison to non-procrastinators.

Finally, to further explore the strength of the relationship of ID presence with procrastination, correlations between ID presence and the three procrastination scales (GPS, AIP, and DPS) scores were calculated as a post-hoc analysis. Biserial point correlation was used because ID presence was a categorical variable. Considering the whole sample, all three correlations were statistically significant. There were medium positive correlations between ID presence and GPS

($r_{pb}(126) = .46$, $p < .001$), as well as AIP ($r_{pb}(126) = .41$, $p < .001$). On the other hand, the correlation between ID presence and DPS was weak ($r_{pb}(126) = .26$, $p = .003$).

Additionally, the proportion of IDs containing a discrepant construct that directly referred to procrastination was calculated for the procrastination group (the participants in control group did not present any discrepancies regarding procrastination). Out of 302 IDs in this group, 80 conflicts regarded procrastination, which constituted 26.49% of all the IDs presented by procrastinators.

Next, an independent samples *t*-test was run to determine if there were differences in the number and intensity of IDs between procrastination and control group, as measured by PICID. There were outliers in PICID observations in the control group, as assessed by inspection of a boxplot. Removing outliers did not resolve the issue of non-normally distributed data. Therefore, both independent samples *t*-test and Mann-Whitney *U* tests were run. Additionally, Welch's correction was applied as assumption of equal variances was violated (assessed with statistically significant Levene's test). Based on the results shown in Table 6, there was a statistically significant difference in PICID between compared groups. Procrastination group ($M = 1.06$; $SD = 1.32$) had a higher mean score on this variable than the control group ($M = 0.36$; $SD = 0.77$), with a medium ES. Taking into account that H1.1 involved two different calculations (ID presence and PICID), we took a *p* value of .025 as the cut-off point to discard the null hypothesis.

Table 6

PICID Between-Group Comparisons

		Statistic	*df*	*p*	Mean difference (*SE*)	ES	
PICID	Student's *t*	3.59[a]	108.24	< .001	0.70 (0.19)	Cohen's *d*	0.64
	Mann-Whitney *U*	1097		< .001		Rank biserial correlation	0.46

Note. PICID – Percentage of Intensity of Constructs of Implicative Dilemmas.

[a] Levene's test was significant ($p < .05$), suggesting a violation of the assumption of equal variances, so Welch's correction was applied.

As a post-hoc analysis of the relationship of IDs' number and intensity with procrastination, correlations between PICID and the three procrastination scales were calculated. All data was non-normally distributed (assessed with statistically significant Shapiro-Wilk's test), so Spearman's *rho* coefficient was used. All three correlations were statistically significant. There were medium positive correlations between PICID and GPS (*rho*(126) = .40, p < .001), as well as AIP (*rho*(126) = .37, p < .001). On the other hand, the correlation between PICID and DPS was weak (*rho*(126) = .26, p = .004).

4.2.2. Differences in Clinical Symptomatology

Multivariate analysis of variance (MANOVA) was run to determine if there were statistically significant differences in clinical symptomatology between procrastination and control groups, as measured by DASS-21 and CORE-OM total scores. There was a linear relationship between the dependent variables. There was no multicollinearity as assessed with not too big (considered greater than .90) correlation coefficients. The multivariate normality assumption was violated as assessed with statistically significant Shapiro-Wilk's test for multivariate normality. The

homogeneity of covariance matrices assumption was considered met with Box's M-test's result *p* value greater than .005 (Huberty, Petoskey, 2000). Using Pillai's trace, there was a significant difference between compared groups, $V = 0.08$, $F(1, 126) = 5.22$, $p = .007$, $\eta_p^2 = .08$. Taking into account that H1.2 involved two different dependent variables (total DASS-21 and CORE-OM), we took a *p* value of .025 as the cut-off point to discard the null hypothesis.

As a post-hoc analysis, separate univariate analyses of variance (ANOVAs) on DASS-21 and CORE-OM total scores revealed statistically significant effects for both measures – $F(1, 126) = 9.77$, $p = .002$ and $F(1, 126) = 9.11$, $p = .003$, respectively. The ESs for both measures were medium – $\eta_p^2 = 0.07$ for DASS-21 and $\eta_p^2 = 0.07$ for CORE-OM.

Additionally, for exploratory purposes, differences in the subscales of DASS-21 and CORE-OM were explored in order to determine which factors differentiated the groups the most regarding mean differences. A series of independent samples *t*-tests was run for this aim. Due to the non-normally distributed data among compared groups, Mann-Whitney *U* tests were also run to support parametric tests' results.

As shown in Table 7, differences regarding DASS-21 scores was statistically significant for all the scales. Participants in the procrastination group ($M = 11.31$; $SD = 10.25$) had a higher mean Depression score than those of the control group ($M = 5.90$; $SD = 6.70$), with a medium ES. Participants in the procrastination group ($M = 8.66$; $SD = 8.78$) had higher mean Anxiety score than control group ($M = 5.74$; $SD = 7.25$). This difference was small. Compared groups differed weakly in Stress as well ($M = 18.36$; $SD = 9.40$ for the procrastination group and $M = 14.31$; $SD = 8.94$ for the control group). In conclusion, it can be seen that Depression was the main source of difference in DASS-21 results.

Table 7

Comparison of Depression, Anxiety, and Stress Scores Between Procrastination and Control Groups

		Statistic	*df*	*p*	Mean difference (*SE*)	ES	
Depression	Student's *t*	3.57[a]	114.65	.001	5.41 (1.52)	Cohen's *d*	0.62
	Mann-Whitney *U*	1363		.001		Rank biserial correlation	0.33
Anxiety	Student's *t*	2.04	126	.043	2.92 (1.43)	Cohen's *d*	0.36
	Mann-Whitney *U*	1578		.025		Rank biserial correlation	0.23
Stress	Student's *t*	2.49	126	.014	4.05 (1.63)	Cohen's *d*	0.44
	Mann-Whitney *U*	1498		.009		Rank biserial correlation	0.27

[a] Levene's test was significant ($p < .05$), suggesting a violation of the assumption of equal variances, so Welch's correction was applied.

Additionally, for exploratory purposes, the strength of the relationship between DASS-21 and its subscales with procrastination (as measured by GPS, AIP, and DPS) was determined. For this aim, Spearman correlations were calculated. As it can be seen in Table 8, Depression correlated strongly with DPS, as well as moderately with GPS and AIP. Anxiety correlated weakly with DPS, while there was no statistically significant correlation between this scale and GPS or AIP. Stress correlated moderately with DPS, while it had no statistically significant correlation with GPS or AIP. Finally, DASS-21 total scores correlated moderately with DPS, as well as weakly with GPS and AIP.

Table 8

Spearman's rho Correlation Coefficients Between DASS-21 and its subscales and GPS, AIP, and DPS

	GPS	AIP	DPS
Depression	0.36***	0.31***	0.51***
Anxiety	0.17	0.12	0.25**
Stress	0.17	0.16	0.32***
DASS-21 total	0.26**	0.21*	0.41***

Note. GPS – General Procrastination Scale; AIP – Adult Inventory of Procrastination; DPS – Decisional Procrastination Scale; DASS-21 – Depression Anxiety Stress Scales—21.

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

When it goes to the subscales of CORE-OM, based on results shown in Table 9, there were statistically significant differences only in Problems and Functioning. Participants of the procrastination group (M = 1.48; SD = 0.76) had higher Problems mean score than those of the control group (M = 1.10; SD = 0.70). The procrastination group (M = 1.15; SD = 0.66) had also higher Functioning mean score than the control one (M = 0.76; SD = 0.52). The ES for both differences was medium. It is worth mentioning as well that in the Well-being subscale, a tendency was found for the procrastination group (M = 1.65; SD = 0.86) which had a higher mean score than control group (M = 1.37; SD = 0.80), with a small ES. In summary, the Functioning subscale was the main source of difference in the CORE-OM score.

Table 9

Well-Being, Problems, Functioning, and Risk Scores Comparison

		Statistic	*df*	*p*	Mean difference (*SE*)	ES	
Well-being	Student's *t*	1.84	126	.068	0.27 (0.25)	Cohen's *d*	0.33
	Mann-Whitney *U*	1691		.092		Rank biserial correlation	0.17
Problems	Student's *t*	2.96	126	.004	0.38 (0.13)	Cohen's *d*	0.52
	Mann-Whitney *U*	1419		.003		Rank biserial correlation	0.31
Functioning	Student's *t*	3.73[a]	123.29	< .001	0.39 (0.11)	Cohen's *d*	0.65
	Mann-Whitney *U*	1329		< .001		Rank biserial correlation	0.35
Risk	Student's *t*	0.18	126	.854	0.01 (0.05)	Cohen's *d*	0.03
	Mann-Whitney *U*	1734		.073		Rank biserial correlation	0.15

[a] Levene's test was significant ($p < .05$), suggesting a violation of the assumption of equal variances, so Welch's correction was applied.

Additionally, as a further exploratory analysis, the strength of the relationship between CORE-OM and its subscales with procrastination (as measured by GPS, AIP, and DPS) was calculated using Spearman correlations. As it can be seen in Table 10, Well-being correlated moderately with DPS and weakly with GPS. Problems correlated moderately with GPS and DPS, as well as weakly with AIP. Functioning correlated strongly with DPS, as well moderately with GPS and AIP. On the other hand, the Risk scale correlated weakly with all procrastination scales. The overall CORE-OM score correlated moderately with all procrastination scales.

Table 10

Spearman's rho Correlation Coefficients Between CORE-OM and its subscales and GPS, AIP, and DPS

	GPS	AIP	DPS
Well-being	0.18*	0.14	0.37***
Problems	0.30***	0.29***	0.42***
Functioning	0.41***	0.41***	0.52***
Risk	0.23**	0.19*	0.23**
CORE-OM total	0.33***	0.31***	0.45***

Note. GPS – General Procrastination Scale; AIP – Adult Inventory of Procrastination; DPS – Decisional Procrastination Scale; CORE-OM – Clinical Outcomes in Routine Evaluation – Outcome Measure.

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

Finally, a series of two-way analysis of variance (ANOVA) was conducted to investigate interaction effects between presence of IDs and both conditions on procrastination measures, DASS-21 subscales and its total score as well CORE-OM subscales and its total score. Based on the main goal of this analysis, only the interaction effects are presented in Table 11. Results for Depression, Anxiety, DASS-21 total score, and CORE-OM total score should be interpreted with caution as they did not meet the assumptions of heterogeneity of variance (assessed with statistically significant Levene's test) and normally distributed residuals (assessed with visual investigation of Q-Q plots of residuals). None of the investigated interaction effects was statistically

significant. However, we can observe a small tendency signaled by a small ES in the DASS-21 (all subscales) and in the Well-being and Functioning scales of CORE-OM.

Table 11

Interaction Effects Between Presence of IDs and Procrastination and Control Conditions

	F	*p*	η_p^2
GPS	0.01	0.938	0.00
DPS	0.02	0.876	0.00
AIP	0.09	0.764	0.00
Depression	0.96	0.330	0.01
Anxiety	1.09	0.298	0.01
Stress	0.81	0.371	0.01
DASS-21 total	1.57	0.212	0.01
Well-being	1.18	0.279	0.01
Problems	0.43	0.511	0.00
Functioning	0.87	0.353	0.01
Risk	0.09	0.759	0.00
CORE-OM total	1.00	0.320	0.01

Note. GPS – General Procrastination Scale; AIP – Adult Inventory of Procrastination; DPS – Decisional Procrastination Scale; DASS-21 – Depression Anxiety Stress Scales—21; CORE-OM – Clinical Outcomes in Routine Evaluation – Outcome Measure.

4.2.3. Differences in Self – Ideal Discrepancy

An independent samples *t*-test was conducted to analyze the difference in self – ideal discrepancy (measured, alike other self-discrepancies presented below, by standardized Euclidean

distance; higher distance indicating larger discrepancy) between procrastination and control group. As distributions of data among groups were non-normal both parametric and nonparametric tests were conducted to corroborate the results. There was a significant difference as shown in Table 12 Procrastination group (M = 0.38; SD = 0.11) had a more negative vision of themselves than control group (M = 0.25; SD = 0.24). The magnitude of the difference was large.

Table 12

Self – Ideal Discrepancy Comparison Between Groups

		Statistic	*df*	*p*	Mean difference (*SE*)	ES	
Self – ideal distance	Student's *t*	7.07	126	< .001	0.13 (0.02)	Cohen's *d*	1.25
	Mann-Whitney *U*	740		< .001		Rank biserial correlation	0.64

Additionally, to promote a better understanding of this association, the strength of the relationship between self – ideal discrepancy and procrastination was gauged. Spearman correlations were calculated between self – ideal distance and the three procrastination scales (GPS, AIP, and DPS). There were strong positive correlations between self – ideal distance and GPS (*rho*(126) = .60, p < .001), as well as AIP (*rho*(126) = .55, p < .001), and DPS (*rho*(126) = .56, p < .001).

4.2.4. Additional Analyses of the Relationship Between Cognitive Structure and Procrastination

A series of independent samples *t*-tests was run to check the differences in self – others and ideal – others discrepancies, cognitive polarization, and interpersonal construct differentiation scores. Data were normally distributed apart from the last variable. Therefore, non-parametric test result for interpersonal construct differentiation was reported in parentheses. As shown in Table 13,

the only statistically significant difference was found in self – others discrepancy. Procrastination group (M = 0.32; SD = 0.08) had a moderately higher mean self – others discrepancy than control group (M = 0.28; SD = 0.07). In the case of ideal – others discrepancy, results indicated a trend (signaled by a small ES), with participants who procrastinated presenting a higher (M = 0.31; SD = 0.08) discrepancy than those who did not (M = 0.29; SD = 0.07).

Table 13

Self – Others Discrepancy, Ideal – Others Discrepancy, Cognitive Polarization, and Interpersonal Construct Differentiation Comparison

	T (U)	*Df*	*P*	Mean difference (*SE*)	Cohen's *d* (Rank biserial correlation)
Self – others distance	2.86	126	.005	0.04 (0.01)	0.51
Ideal – others distance	1.71	126	.090	0.02 (0.01)	0.30
Cognitive polarization	-0.39	126	.698	-0.83 (2.14)	-0.07
Interpersonal construct differentiation	0.52 (1926)	126	.602 (.577)	0.84 (1.61)	0.09 (0.06)

Additionally, as a further exploration, the strength of the relationship between these variables and procrastination was measured. For this aim, Spearman correlations were calculated between self – others distance, self – ideal distance, cognitive polarization, interpersonal construct differentiation and the three procrastination scales (GPS, AIP, and DPS). As it can be seen in Table 14, the only significant correlations were the ones between self – others distance and GPS, AIP, and DPS, as well as between ideal – others distance and GPS and AIP. All the ESs were small. On the other hand, there were no statistically significant correlations between cognitive polarization or interpersonal cognitive differentiation and any of the procrastination scales.

Table 14

Spearman's rho Correlation Coefficients Between Self – Others Discrepancy, Ideal – Others Discrepancy, Cognitive Polarization, and Interpersonal Construct Differentiation Comparison and GPS, AIP, and DPS

	GPS	AIP	DPS
Self – others distance	0.25**	0.28**	0.17*
Ideal – others distance	0.19*	0.22*	0.09
Cognitive polarization	-0.11	-0.16	-0.14
Interpersonal construct differentiation	0.10	0.05	0.08

Note. GPS – General Procrastination Scale; AIP – Adult Inventory of Procrastination; DPS – Decisional Procrastination Scale.

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

Finally, a logistic regression was performed with the categorical variable ID presence and the following continuous variables: self – ideal distance, DASS-21 total score, and CORE-OM total score. In order to control for the possible interference of age or gender in the prediction model, we decided to include these variables as well. The aim of this analysis was to examine which of the variables of cognitive structure and clinical symptomatology best predicted belonging to the procrastination condition. Input scales' differences created an issue with large odds ratio, so continuous variables were standardized (Gelman, 2008). The results of the Hosmer and Lemeshow test confirmed the goodness of fit of this model, $\chi^2(8) = 4.49$, $p = .811$. Out of the four introduced variables, only self – ideal distance and ID presence turned out to be the best predictors of belonging to the procrastination group. This final model explained 43.1% of variance (Nagelkerke's

R^2) and its goodness of fit was confirmed by the results of the Hosmer and Lemeshow test, $\chi^2(8) = 1.60$, $p = .991$. Based on the results of the final model shown in Table 15, participants with presence of IDs and larger self – ideal distance score were more likely to belong to the procrastination group. This model was able to correctly classify 76.6% of participants (72.1% to the control group and 80.6% to the procrastination group). Figure 4 represents the receiver operating characteristic curve for the final regression model.

Table 15

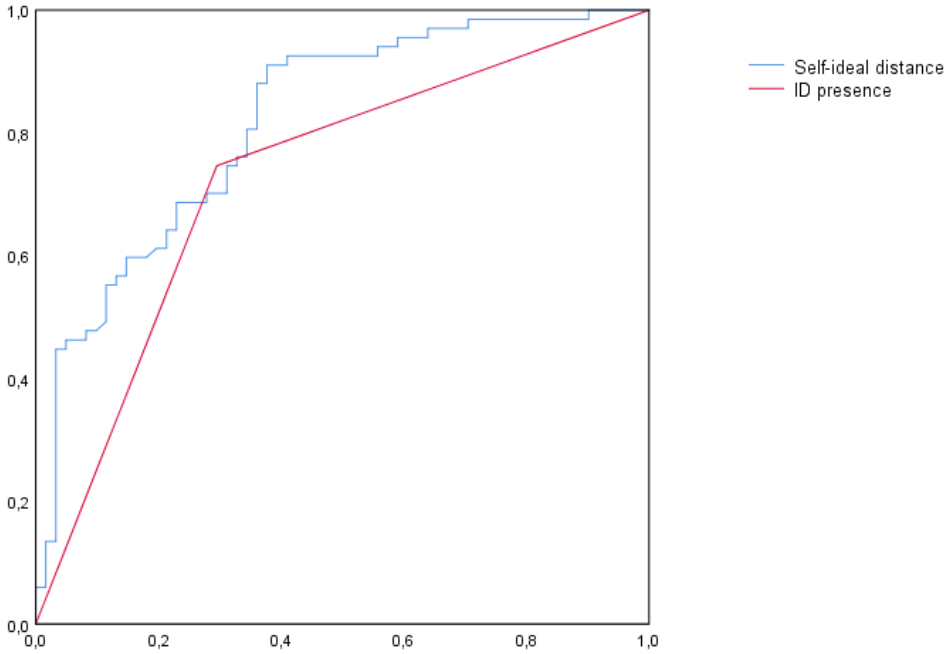
Model for Predicting Group Belonging (Procrastination or Control) Resulting From Logistic Regression Analysis

	B	SE	Wald	df	*p*	Exp(*B*) (Standardized)
ID presence	1.18	0.46	6.72	1	0.010	3.26
Self – ideal distance	10.30	2.52	16.76	1	<0.001	29725.56 (12.19)
Intercept	-3.71	0.77	23.37	1	<0.001	0.02

Note. *B* – estimate representing the log odds for procrastination vs control.

Figure 4

Receiver Operating Characteristic Curve for the final Logistic Regression Model



Note. Vertical axis represents sensibility, horizontal axis represents specificity.

4.3. Results of Study 2

4.3.1. Influence of the Therapeutic Intervention on the Level of Procrastination and Clinical Symptomatology

In order to verify whether the brief therapeutic intervention produced a change in procrastination scales as well as in clinical symptomatology Repeated Measures Multivariate Analyses of Variance (RM MANOVAs) followed up by separate univariate tests (RM ANOVAs) were conducted. Since five variables were needed to contrast the first hypothesis of this study (H2.1), Bonferroni correction for multiple comparison was applied, this setting the *p* value for rejecting the null hypothesis at .01.

First, a RM MANOVA on the three procrastination scales (GPS, AIP, and DPS) was run. There were no univariate or multivariate outliers. There was a linear relationship between each pair of dependent variables. There was no multicollinearity as assessed with not too big (considered

greater than .90) correlation coefficients. Using Pillai's trace, there was a significant difference in the level of procrastination at pre-treatment and post-treatment $V = .70$, $F(3, 25) = 18.56$, $p < .001$, $\eta_p^2 = .70$.

Separate univariate tests (RM ANOVAs) on the outcome variables (GPS, AIP, and DPS) revealed statistically significant effects – $F(1, 27) = 25.31$, $p < .001$ for GPS, $F(1, 27) = 56.64$; $p < .001$ for AIP, and $F(1, 27) = 12.89$; $p = .001$ for DPS. Participants had lower GPS scores at post-treatment ($M = 62.20$; $SD = 12.80$) than at pre-treatment ($M = 73.90$; $SD = 8.73$), with a large ES ($\eta_p^2 = .48$). AIP scores decreased from $M = 55.80$ ($SD = 7.36$) at pre-treatment to $M = 44.90$ ($SD = 10.40$) at post-treatment, with a large ES as well ($\eta_p^2 = .68$). DPS scores changed from $M = 17.30$ ($SD = 4.88$) to $M = 14.20$ ($SD = 4.44$). The ES for this scale was large ($\eta_p^2 = .32$).

Using Pillai's trace of the second RM MANOVA, it was found as well that there was a statistically significant difference in clinical symptoms between pre- and post-treatment measures $V = .34$, $F(2, 26) = 6.63$, $p = .005$. Separate RM ANOVAs on the outcome variables (DASS-21 total score and CORE-OM total score) revealed statistically significant effects – $F(1, 27) = 8.74$, $p = .006$ and $F(1, 27) = 13.07$, $p = .001$, respectively. DASS-21 total score decreased from $M = 36.90$ ($SD = 25.80$) at pre-treatment to $M = 23.30$ ($SD = 17.00$) at post-treatment, with a large ES ($\eta_p^2 = .24$). CORE-OM total score changed from $M = 1.13$ ($SD = 0.76$) at pre-treatment to $M = 0.70$ ($SD = 0.53$) at post-treatment, with a large ES as well ($\eta_p^2 = .33$).

Additionally, for exploratory purposes, a series of paired samples *t*-tests was run to gauge the changes in the mean differences on the subscales of DASS-21 and CORE-OM. Data was normally distributed (assessed with non-significant Shapiro-Wilk's test) except for Depression, Anxiety, and Risk scales. Hence, parametric tests were supported with non-parametric Wilcoxon signed-rank test. As shown in Table 16, there was a statistically significant change in every variable except in Anxiety and Risk subscales. There were lower mean scores at post-intervention on each of the compared variables indicating improvement after the therapeutic intervention.

When it goes to DASS-21 subscales, Stress decreased from *M* = 17.60 (*SD* = 8.83) to *M* = 11.00 (*SD* = 6.94) with a medium ES. The ES for Depression was small, changing from *M* = 11.20 (*SD* = 11.60) to *M* = 7.21 (*SD* = 9.45) after the intervention. Although the difference in the Anxiety subscale was non-significant, the tendency was in the predicted direction with a small ES. The mean score on this subscale decreased from *M* = 8.00 (*SD* = 8.99) at pre-treatment to *M* = 5.07 (*SD* = 5.51) at post-treatment.

Finally, the Well-being and Problems' subscales of CORE-OM changed with a medium ES. The mean score on the first subscale decreased from *M* = 1.45 (*SD* = 0.92) at pre-treatment to *M* = 0.97 (*SD* = 0.67) at post-intervention, while the latter changed from *M* = 1.36 (*SD* = 0.90) to *M* = 0.79 (*SD* = 0.64) after the intervention. The scores in Functioning also decreased, from *M* = 1.14 (*SD* = 0.65) to *M* = 0.83 (*SD* = 0.63) with a small ES. Finally, there were no statistically significant differences in the Risk scores, but there was a tendency in the predicted direction, signaled by a small ES. The mean score on this subscale decreased from *M* = 0.21 (*SD* = 0.36) to *M* = 0.10 (*SD* = 0.23).

Table 16

Pre and Post Therapeutic Intervention Comparisons for DASS-21 and CORE-OM Subscales

	t (W)	*df*	*P*	Cohen's *d* (Rank biserial correlation)
Depression	2.33 (213)	27	.028 (.022)	0.44 (0.54)
Stress	4.08	27	< .001	0.77
Anxiety	1.55 (193.5)	27	.132 (.217)	0.29 (0.29)
Well-being	2.85	27	.008	0.54
Functioning	2.62	27	.014	0.49
Problems	3.73	27	< .001	0.71
Risk	2.11 (71)	27	.044 (.080)	0.40 (0.56)

Note. DASS-21 – Depression Anxiety Stress Scales—21; CORE-OM – Clinical Outcomes in Routine Evaluation – Outcome Measure.

4.3.2. Influence of the Therapeutic Intervention on the Presence, Number, and Intensity of Implicative Dilemmas

First, chi-square tests were used for comparing the frequency in the presence of IDs before and after the intervention. 50% of expected cell frequencies were lower than five, so Fisher's exact tests were applied. The result was statistically non-significant ($p = 1.00$), indicating that there was no pattern in change of IDs presence. Frequencies of IDs are presented in Table 17.

Table 17

Presence of Implicative Dilemmas Before and After the Intervention

ID presence pre-treatment		ID presence post-treatment		Total *n* *row %*
		No	Yes	
No	*N*	3.00	2.00	5.00
	row %	10.71 %	7.14 %	17.85%
Yes	*N*	11.00	12.00	23.00
	row %	39.29 %	42.86 %	82.15%
Total	*N*	14.00	14.00	28
	row %	50%	50%	100%

Next, paired samples *t*-test was conducted to compare PICID scores before and after the therapeutic intervention. Data was normally distributed (assessed with non-significant result in Shapiro-Wilk's test). The change in PICID, although non-significant ($p = 0.103$), occurred in the predicted direction and was characterized by a small ES ($d = 0.32$). The participants decreased their number of IDs from $M = 1.16$ ($SD = 1.07$) to $M = 0.65$ ($SD = 1.10$) at post-treatment.

4.3.3. Relationship Between the Change in the Number and Intensity of Implicative Dilemmas and Change in the Intensity of Clinical Symptoms

First, changes in IDs number and intensity parameter (PICID) and clinical symptoms (DASS-21 and its subscales as well as CORE-OM and its subscales) were computed by subtracting post-treatment measures from pre-treatment measures. Next, it was checked whether the change in PICID was related to changes in clinical symptoms. Due to non-linear relationships between the variables, Spearman's *rho* correlation coefficients were computed. None of the coefficients was

statistically significant as shown in Table 18 for DASS-21 and its subscales and Table 19 for CORE-OM and its subscales.

Table 18

Spearman's rho Correlation Coefficients Between Change in PICID and Change in DASS-21 and its Subscales Scores

	ΔPICID
ΔDepression	0.17
ΔAnxiety	0.24
ΔStress	0.18
ΔDASS-21 Total	0.15

Note. Δ – Pre-intervention scores minus post-intervention scores in the given variable; DASS-21 – Depression Anxiety Stress Scales—21; PICID – Percentage of Intensity of Constructs of Implicative Dilemmas.

Table 19

Spearman's rho Correlation Coefficients Between Change in PICID and Change in CORE-OM and its Subscales Scores

	ΔPICID
ΔWell-being	0.01
ΔProblems	0.29
ΔFunctioning	0.12
ΔRisk	0.18
ΔCORE-OM Total	0.15

Note. Δ – Pre-intervention scores minus post-intervention scores in the given variable; CORE-OM – Clinical Outcomes in Routine Evaluation – Outcome Measure; PICID – Percentage of Intensity of Constructs of Implicative Dilemmas.

4.3.4. Influence of Resolving Cognitive Conflicts on the Level of Procrastination

Changes in AIP, DPS, and GPS were compared between participants who fully resolved their IDs and participants who did not resolved them. Because three comparisons are involved in testing this hypothesis (H2.4), Bonferroni correction was applied taking .02 as the *p* value for rejecting the null hypothesis. There were 23 participants who presented IDs at pre-treatment, with 11 of them being able to resolve these conflicts. Due to the small sample size, this analysis should be treated as preliminary and interpreted with caution.

Because dependent variables were normally distributed among compared groups, an independent samples *t*-test was run for this aim. Assumptions of equal variances were met (assessed with non-significant Levene's test). Due to small sample sizes the *t* tests' results were supported with *U* Mann-Whitney tests. As shown in Table 20, only the difference in change in GPS was

statistically significant. Participants who resolved their IDs (*M* = -18.64; *SD* = 10.76) had greater change in GPS compared to participants who did not resolve their IDs (*M* = -6.58; *SD* = 10.77) with a large ES. Also, a large (non-significant) ES was found for AIP suggesting a tendency: those who resolved their IDs (*M* = -15.18; *SD* = 8.83) had greater change in AIP change compared to participants who did not resolve their IDs (*M* = -8.00; *SD* = 6.30). Similarly, participants who resolved their IDs (*M* = -4.72; *SD* = 4.63) might show a tendency (as signaled by a medium ES) to show more change in DPS than those who did not resolve their IDs (*M* = -2.17; *SD* = 5.02).

Table 20

Difference in Change in AIP, DPS, and GPS Between Participants who did and did not Resolve Their IDs

	t (U)	*df*	*p*	Cohen's *d* (Rank biserial correlation)
ΔAIP	2.26 (101.00)	21	0.034 (0.033)	0.94 (0.53)
ΔDPS	1.27 (87.50)	21	0.219 (0.195)	0.53 (0.33)
ΔGPS	2.68 (104.50)	21	0.014 (0.019)	1.12 (0.58)

Note. Δ – pre-intervention scores minus post-intervention scores in the given variable; GPS – General Procrastination Scale; AIP – Adult Inventory of Procrastination; DPS – Decisional Procrastination Scale.

4.3.5. Additional Analyses

Furthermore, we decided to explore possible changes in RGT indexes not included in our hypotheses (self-discrepancies, cognitive polarization, and interpersonal construct differentiation). For this aim, a series of paired samples *t*-tests was conducted. Data was normally distributed (assessed with non-significant Shapiro-Wilk's test). As shown in Table 21, there was a statistically

significant change in self – ideal and self – others discrepancies, with large and small ESs, respectively. The self – ideal distance diminished from *M* = 0.40 (*SD* = 0.12) at pre-treatment to *M* = 0.33 (*SD* = 0.13) at post-treatment, while the self – others distance decreased from *M* = 0.32 (*SD* = 0.08) to *M* = 0.31 (*SD* = 0.08) after the treatment. Additionally, there was a trend in change in cognitive polarization, with a small ES. Participants' score on this index decreased from *M* = 29.60 (*SD* = 10.70) at pre-treatment to *M* = 27.30 (*SD* = 9.66) at post-treatment. On the other hand, differences in ideal – others discrepancy and interpersonal construct differentiation were not statistically significant, although there was a negative trend in the first variable, signaled by a small ES. This discrepancy increased from *M* = 0.32 (*SD* = 0.08) to *M* = 0.33 (*SD* = 0.07). Finally, interpersonal construct differentiation decreased from *M* = 41.80 (*SD* = 8.84) at pre-treatment to *M* = 41.10 (*SD* = 6.38) at post-treatment.

Table 21

Pre and Post Therapeutic Intervention Comparisons for Self-Discrepancies, Cognitive Polarization, and Interpersonal Construct Differentiation

	t (W)	*Df*	*p*	Cohen's *d*
Self – ideal distance	5.40	27	< .001	1.02
Self – others distance	2.15	27	.040	0.41
Ideal – others distance	-1.08	27	.290	-0.20*
Cognitive polarization	1.72	27	.096	0.33
Interpersonal construct differentiation	0.66	27	.515	0.13

Note. * - Difference had a negative value (post-intervention scores were higher than pre-intervention scores).

5. Discussion

5.1. General Discussion

This thesis had the general aim of advancing the knowledge on cognitive structure and conflicts in student procrastination. Two studies were designed for that purpose. In the first, cross-sectional study, we analyzed the cognitive structure and conflicts of procrastinating students and compared them on these variables, as well as on clinical symptomatology, to the students that did not suffer from this problem. The second, longitudinal study entailed analyzing the changes after a brief cognitive intervention in the cognitive structure and conflicts as well as its relationship to the change in the levels of procrastination and clinical symptoms.

Both studies had their specific objectives as well, followed by the hypotheses based on previous research on procrastination. The results of testing all the consecutive hypotheses are discussed below. We discuss as well the additional, exploratory analyses conducted in both studies.

When it goes to Study 1, we expected that students who procrastinate would have a higher presence as well as number and intensity of IDs than those who do not procrastinate (H1.1). Our hypothesis was confirmed by the results, with moderately strong effects. On the one hand, more participants in the procrastination group had IDs compared to controls, and, on the other hand, also the number and intensity of these conflicts in this group was higher. These differences are in line with other studies conducted within the MDP which found that the participants in a wide variety of clinical conditions differed consistently on these variables in comparison to the control groups (Benasayag et al., 2011; Compañ et al., 2011; Escandón-Nagel et al., 2018; Feixas et al., 2010; Feixas, Montesano, Compañ et al., 2014; Feixas, Montesano, Erazo-Caizedo et al., 2014; Melis et al., 2011; Montesano et al., 2014; Soldevilla et al., 2014) which confirms the transdiagnostic nature of this type of CC. We need to note that the PID index was used to measure IDs number in those studies, whereas, as we mentioned in section 3.1.3.6.1, we used PICID because it examines both the number and intensity of these CCs and thus is methodologically more precise.

When it goes to ID presence, the percentage of procrastinators who presented with at least one ID (74.6%) was one of the highest if compared to the clinical groups of the other studies. So was the odds ratio (7.03) for this variable. If our study was added to the meta-analysis conducted by Montesano et al. (2015), this OR would be the second largest out of the ten studies, preceded only by the OR for ID presence in bulimia nerviosa (11.05). These results indicate that ID presence is a highly relevant variable when differentiating between procrastinators and non-procrastinators, and it plays an important role in this problem. This was confirmed by the binary logistic regression that we performed as an additional analysis (discussed in detail further in this section) in which it was shown that only the self – ideal discrepancy and ID presence were able to predict belonging to procrastination and control groups for a high (76.6) percentage of participants.

In contrast to the procrastination group, only 29.5% of participants in the control group presented with IDs and, additionally, the number of this type of conflict in individual participants was significantly lower. The percentage of controls with IDs is similar to the ones in the control groups in the aforementioned studies which confirms the finding that IDs are a universal phenomenon and are present as well in people without any specific psychological problems, though in a much lower rate than in the case of those who suffer from a concrete condition. This, as Feixas et al. (2009) note, is coherent with Kelly's (1955/1991) observation, expressed in his Fragmentation and Modulation corollaries, regarding the fact that most people can tolerate some amount of incompatibility in their construct systems. The need for continuity and coherence in our identity may result in internal conflicts and preclude the desired change, whether we develop a disorder or not (Feixas et al, 2009). Nevertheless, we can see that in clinical samples this proneness to conflict is definitely higher and, as we discuss further in this section, comes along with significant suffering.

We need to add, however, that merely 26.49% of all IDs in the procrastination group included procrastination in the discrepant construct. Hence, there were as well other IDs influencing the dilemmatic functioning of their construct systems and, most probably, resulting in, or at least

correlating, with procrastination. At the same time, we suspect that if we analyzed the semantics of all constructs, we would probably find that more of them are related to procrastination in a synonymous or less direct way through, for example, constructs referring to fear of failure, perfectionistic strivings, or need of freedom from authority. All these issues were found to correlate to some extent with procrastination behavior (Haghbin & Pychyl, 2007; Haghbin et al. 2012; Rice et al., 2011; Sederlund et al., 2020; Solomon & Rothblum, 1984; Zakeri et al., 2013). Therefore, after conducting such an analysis, the abovementioned percentage could be significantly higher.

Measuring correlations between presence, and combined number and intensity (PICID) of IDs with the three procrastination scales used in this study provided us with novel information regarding the strength of association between these CCs and different types of procrastination. The moderately strong correlations of general procrastination questionnaires (GPS and AIP) with both having IDs, as well as their number and intensity suggest that IDs may play an important role in behavioral procrastination presented across various areas of life. On the other hand, the potential importance of IDs in decisional procrastination seems to be slightly smaller than in general procrastination (as signaled by a small ES), though still significant. Therefore, if further studies replicate this finding, we may conclude that consistently postponing decisions is related to IDs presence, number, and intensity but to a lesser degree than in the case of more general types of procrastination.

Our results regarding the central role of IDs in procrastination add a novel understanding of this problem because, as far as we know, researchers have not been seeing procrastination as a way of protecting one's identity in a coherent, adaptive way. In the literature we reviewed, procrastination is almost univocally seen as a self-regulatory failure (e.g., Ferrari, 2001; Rozental & Calbring, 2014; Sirois & Pychyl, 2013; Steel, 2007). However, seen through constructivist lens, procrastination is, as paradoxically as it may sound, a totally adaptive, though most often unconscious, choice to protect a person's construct system from painful invalidation and disruption

in identity resulting from getting rid of this problem. Therefore, it can be seen as a self-regulatory success rather than failure. In other words, when forming part of an ID, procrastination regulates the homeostasis of the construct system and it fits well into the constructivist idea of the pro-symptom position (Ecker et al., 2012) – a stance that is adapted to protect the core aspects of self by unwillingly "producing" the symptom, in accordance with semantic schemas created usually in one's past. What is more, these authors (Ecker & Hulley, 1996, 2019; Ecker et al., 2012) have described various single case studies in which procrastination fulfilled this protective function, so we may conclude that our studies add some validity to these observations.

Along these lines, the high prevalence of IDs in those who procrastinate raises a question about the sense of treating procrastination with a therapeutic intervention that mainly uses counteracting strategies. A failure to help the procrastinator can be explained by unintentionally attacking their core constructs which are protected by procrastination. Our results should motivate clinicians to adapt an empathetic, non-counteractive approach when intervening in this problem because, as we can see, the possible resistance to change is a natural result of having IDs (Feixas, 2016). An intervention focused on dilemma resolution rather than on counteracting the symptom of procrastination may be, in our opinion, an effective way of solving the internal conflict by reorganizing the construct system so that procrastination loses its function. An example of such an intervention is dilemma-focused therapy (DFT), created within the MDP (Feixas et al., 2013; Feixas & Compañ, 2015). It proved to be effective in resolving CCs and can be used both as an independent intervention or together with other approaches (Feixas et al., 2016). Other constructivist models focused on resolving CCs are, for example, the aforementioned coherence therapy (Ecker & Hulley, 1996, 2019) or immunity to change (Kegan & Lahey, 2009).

Our finding regarding the high presence and number of IDs in procrastination offers as well a deepened vision of the theories of procrastination proposed by its researchers. Even if we adopt the view of this behavior as a self-regulatory failure, we can now see the internal reasons for failing

consistently to stop procrastination despite a desire to change. An appreciation of IDs may enrich the theories which focus on conflict at the motivational, volitional, or situational level, such as the Temporal Motivation Theory (Steel & König, 2006) or the Temporal Decision Model (Zhang, Liu, and Feng, 2019) by adding an alternative, person-centered understanding of task aversiveness, motivation to avoid acting, or reasons to delay beyond the characteristics of the task or the time available to perform it. The notion of CC seen from PCT's point of view may explain better as well the norm-based approach offered by Giguère et al. (2016) which seem to lack an explanation of the function of procrastination. Shame and/or guilt felt by procrastinators after transgressing social norms may be explained in terms of internal conflicts. In such a possible ID, the need to protect one's identity leads to the transgression of norms and, consequently, provokes the feeling of being intrinsically bad (shame) or guilty. IDs can explain as well why procrastination is so difficult to abandon even when people are conscious of the physical, relational, professional/academic, and financial problems it causes in their daily life.

When it goes to the relationship of procrastination with clinical symptomatology, we expected to find that students who procrastinate would present a higher level of clinical symptoms than those who do not do it (H1.2). This hypothesis was confirmed. Differences in DASS-21 and CORE-OM were significant with a medium ES in both scales.

Additional exploratory analyses on between-group differences regarding the subscales of these two questionnaires provided us with information about the significance of specific symptoms and problems in procrastination. When it goes to DASS-21, it came out that Depression differentiated the most between procrastinators and non-procrastinators, with a medium ES. The differences on Anxiety and Stress, though small, were significant as well. These results confirm many previous findings that repeatedly showed that procrastinators suffer from depression, anxiety, and stress more than those who do not procrastinate (Beswick et al., 1988; Ferrari, 1991; Lay, 1995;

Solomon & Rothblum, 1984; Steel, 2007; Tice & Baumeister, 1997; Uzun Ozer et al., 2014; van Eerde, 2003).

Additionally, the higher weight of depression than the other two symptoms confirms the findings which say that it can play a more important role in procrastination than anxiety or stress. Specifically, van Eerde (2003) found in her meta-analysis that depression correlated with procrastination slightly more than anxiety, though both correlations were moderate. Moreover, Lay (1995) found that dejection/depression-related feelings were more prevalent in procrastination than the ones related to agitation/anxiety. However, following other researchers (Block et al, 1991; Clark & Warson, 1991; Kendall & Watson, 1989, as cited in Lay, 1995) he stated that depression and anxiety were only quasi-independent and their dynamic and conceptual overlap should not be ignored. More recent research (Chan et al., 2011; Watson, 2005; Zimmerman et al., 2019) has given validity to this view and emphasize the significant comorbidity between depression and anxiety. Therefore, we believe that this approach should be considered when analyzing procrastination's correlates, including our results.

Nevertheless, our further exploratory analyses on correlations between DASS-21 and its subscales and the three procrastination scales confirmed that depression was the predominant symptom associated with procrastination, correlating strongly with DPS and moderately with GPS and AIP, quite similarly to what was found by van Eerde (2003) and Steel (2007) in their meta-analyses. At the same time, anxiety and stress correlated only with DPS, with small and medium ESs, respectively. The lack of correlation of these symptoms with behavioral procrastination (in the predicted direction but too low to reach significance) is somehow surprising since at least weak, but significant correlations for these problems and procrastination have been reported usually (Steel, 2007; van Eerde, 2003). Several factors could help to explain this unexpected results (e.g., lack of power, no exams or deadlines at the time of testing, different assessment instruments) but we will have to trust in future research to resolve this question.

In sum, it is no wonder that the Depression scale was the main source of DASS's total score's moderate correlation with DPS and weak correlations with the behavioral procrastination scales. Apart from highlighting the important role of depression in procrastination, we may draw another conclusion from this analysis: it is the decisional procrastination that has the strongest and most significant relationship with the clinical symptoms measured by DASS. This could mean that while behavioral procrastination correlates with some suffering, it is actually the postponing of making decisions that is linked the most to feeling depressed (especially), as well as anxious and stressed. Obviously, it is not a causal relationship, so it may work both ways which would be understandable and was emphasized already in other studies (e.g., Steel, 2007; Pychyl & Flett, 2012). It has been widely known that depressed, anxious, and stressed people may procrastinate more than the ones who do not feel this way, but it seems they procrastinate especially on taking decisions. These results represent an important supplement to the existing knowledge on various types of procrastination and their correlates, mentioned in the Introduction of this dissertation.

At the same time, from PCT's point of view, it is of no wonder that people who are depressed, anxious, and stressed would procrastinate more than those who do not feel these ways. Here again, procrastination (behavioral or decisional) can be seen as a mean to avoid further invalidation (a process that Kelly, 1955/1991, termed "constriction") of the already invalidated, and thus depressed, anxious, or stressed self. The predominant role of indecision in procrastination's relationship with clinical symptoms can be understood as resulting from certain CCs causing a blockage in Kelly's cycle of experience, while at the same time protecting one's core constructs.

A more nuanced way of viewing this problem is through Kelly's Circumspection-Preemption-Control (C-P-C) cycle (1955/1991) in which the person engages when their construct system requires revision. In the Circumspection phase the individual analyzes different options regarding a given experience or situation. Next, in the Preemption stage, one specific option (construct pole) is chosen as the most valid one, in accordance with the choice corollary. Finally, in

the Control phase, the choice is tested in practice which then influences the revision (or its absence) of the personal construct system. Hence, we may assume that while the behavioral procrastinators are stuck in the Control stage of the C-P-C cycle (they now what they should do, but they postpone the action), the decisional procrastinators seem to be struggling already in the previous phases, not being able to even move to the Control stage, probably protecting their core constructs from invalidation and at the same time feeling bad about their indecision. This perspective goes in line with the finding that says that indecisive people procrastinate because of searching for additional information regarding the chosen alternatives (Ferrari & Dovidio, 2000). The latter seems to be one of their strategies to avoid invalidation rather than a behavior stemming from conscientiousness which is one of the strongest negative correlates of procrastination (Steel, 2007; van Eerde, 2003).

PCT's understanding of procrastination's relationship with negative mood states (especially depression) may be further complemented with what Steel (2007) noted at the theoretical level:

> Procrastination has long been viewed as a way of temporarily evading anxiety that unfortunately becomes compounded when later faced (Mayers, 1946; Solomon & Rothblum, 1984). Thus procrastination may initially improve mood but should worsen it later. This opens the possibility of a deviation-amplifying loop, specifically a depression spiral (Lindsley, Brass, & Thomas, 1995). Given that depression may lead to procrastination and can be characterized as an extended period of negative affect, a poor mood itself may not only result from procrastination but also create it. (p. 70)

Moving on to the relationship of procrastination with the symptoms measured by CORE-OM, our results indicated that while student procrastinators differed in a statistically significant manner from non-procrastinators on its total score, only the subscales of Problems and Functioning differentiated significantly (with medium ESs) between the two groups. This is congruent with the results of numerous studies that showed that procrastination corresponds with impaired functioning and having problems not only in the academia, but as well generally, in such areas of life as work,

relationships, physical and psychological health, or finances (e.g., Kroese et al., 2014; Lay & Brokenshire, 1997; Li et al., 2020; Nye & Hillyard, 2013; Sirois & Pychyl, 2016; Steel, 2007; Tice & Baumeister, 1997). On the other hand, our results did not directly confirm the difference between procrastinators and non-procrastinators regarding well-being. However, despite the lack of statistical significance, there was a trend in that direction (signaled by a small ES) showing that indeed those who procrastinate assess their well-being as worse than those who do not engage in this behavior, which is compatible with the aforementioned research as well. Finally, there was no significant difference on the Risk scale which is somewhat surprising because we could hypothesize that the decreased well-being, impaired functioning, and larger number of problems would correlate with some risky thoughts or behaviors towards self and/or others. There are in fact a few studies showing some evidence for a higher suicide proneness (Klibert et al., 2011), risky driving and unsafe sexual practices (Keinan & Bereby-Meyer, 2012), or alcohol abuse (Phillips & Ogeil, 2011) among procrastinators. A possible explanation of the absence of difference in Risk in our results is that the questions in this subscale refer to very specific situations and states (aggressive thoughts and behaviors directed at oneself or others) that characterize people with more severe symptoms than those presented by our participants. It is therefore probable that they did not experience these thoughts or behaviors in the week prior to being evaluated for our study. Because of its clinical significance, it would be definitely interesting to further study this aspect of procrastination.

The additional correlational analyses provided a deeper insight of the relationship between CORE-OM and different types of procrastination. Well-being correlated moderately with all three scales, alike the finding of Stead et al. (2010) who used GPS and PASS to measure procrastination. Hence, we may hypothesize that if our sample was larger, the mean difference between groups on this scale might achieve statistical significance as well. Similar to the results discussed above, the Risk subscale correlated weakly with procrastination scales, so we may see that, although small, there is some relationship between postponing behaviors and decisions and risky thoughts or

actions. Problems correlated moderately with GPS and DPS, while weakly with AIP. However, the difference between GPS and AIP was minimum – one of *rho* = 0.01, setting AIP just below the threshold of a medium strength correlation, so we may assume that these correlations were essentially the same. This result is quite consistent with the one found by Steel (2007) who, in his meta-analysis, found a strong correlation between procrastination and various types of problems, especially self-handicapping. Finally, impaired functioning seems to be associated especially with indecisiveness, as shown by a strong correlation with DPS. Hence, once again, we can see that procrastinating on making decisions relates to more harm for the individual than doing it behaviorally (GPS and AIP correlated moderately with this subscale). Taking all the subscales together, CORE-OM's total score correlated moderately with all procrastination scales, though the highest of these correlations was the one with DPS which seems to occur because of its relationship with the poorer functioning of procrastinators.

The last analysis conducted when testing H1.2 was the ANOVA, performed to compare the effect of having at least one ID on the procrastination scales and the two clinical symptoms scales together with their subscales across the two groups. While there was no statistically significant effect in any of the investigated scales, the small tendencies found in DASS-21 and its subscales, as well as in Functioning and Problems, indicate that ID presence may be a factor to consider in the interaction between procrastination and suffering from clinical symptoms. Further research on these effects is recommended.

The third hypothesis in Study 1 referred to self now – ideal self discrepancy. We expected it to be larger among students who procrastinate than among those who do not present this problem (H1.3). This hypothesis was confirmed, with a large ES, actually the largest when it goes to the differences among all the variables of cognitive structure (followed by ID presence). Additionally, we found that this discrepancy correlated strongly both with the two behavioral procrastination scales, as well as with the decisional one.

As we mentioned before, the self – ideal discrepancy may be interpreted as a measure of self-esteem or self-evaluation, so our results confirm the numerous findings that say that procrastinators struggle with low self-esteem (e.g., Ferrari, 1991; Lay, 1995; Solomon & Rothblum, 1984; Spada et al., 2006; Steel, 2007; Tice & Baumeister, 1997; Uzun Ozer et al., 2014; van Eerde, 2003). We believe as well that the self – ideal discrepancy, which directly reflects a situation in which a person is not like they want to be according to their own subjective constructs, may represent at the same time a measure of self-efficacy, another essential correlate of procrastination (Gamst-Klaussen et al., 2019; Krispenz et al., 2019; Steel, 2007; van Eerde, 2003; Wäschle et al., 2014). In fact, as we mentioned in the Introduction, van Eerde (2003) noted that low self-esteem and low self-efficacy may be viewed as forming part of a negative self-image construct which, in our opinion, seems to fit well with self – ideal discrepancy as measured by the RGT.

When it goes to the scarce research on self-discrepancies and procrastination, it was found that the self – ideal discrepancy measured by instruments other than the RGT was indeed higher in procrastination groups (Lay, 1995; Orellana-Damacela et al, 2000, Ferrari, Driscoll et al., 2007; Smith et al., 2017). Furthermore, our results confirm the ones of McGarity-Palmer et al. (2019) who found that self-critical cognition plays an important role in indecision. Low self-esteem was as well one of the correlates of decisional procrastination found by Effert and Ferrari (1989).

Our results provide support for the role of self – ideal discrepancy in procrastination, adding to the extant literature the novel element of the idiosyncratic way of measuring discrepancies using RGT. This allows us to get to know the construction of self in people's own subjective terms through their personal constructs, instead of applying preestablished diagnostic scales. As Feixas et al. (2010) note:

> We think the perception of self as evaluated from the point of view of the person's own (idiosyncratic) constructs could have a different function in self-regulation than traditional measures of self-esteem which are derived from theoretical constructs as expressed in

> questionnaire items. Specifically, Watson and Watts (2001) indicated that the sense of personal value is based on the similarity between the perception of «present self» and «Ideal self» in terms of the attributes that are important for the person. The RGT allows the assessment of self-esteem in the participants' own terms. (p. 453)

When it goes to other studies using RGT as a measure of self – ideal discrepancy, the latter has been consistently larger in clinical groups than in controls in problems such as anxiety (Melis et al., 2011); bulimia nerviosa (Feixas et al., 2010), various depressive disorders (Feixas, Erazo-Caicedo et al., 2008; Feixas et al. 2021; Mieres et al., 2020; Montesano et al., 2017), fibromyalgia (Compañ et al., 2011), or psychosis (Mieres et al., 2020). As we can see, procrastination can be added to this list, gaining one more argument for being treated as a serious clinical problem.

In the additional analyses conducted in Study 1, we gauged the mean group differences in two other self-discrepancies measured by RGT. It came out that students who procrastinate view themselves as significantly (with a medium ES) more different from others than students who do not have this problem. This is, to the best of our knowledge, a novel finding in the research of procrastination. It was confirmed by the additional correlational analysis which showed small, but significant correlations between all three procrastination scales and self – others discrepancy.

From PCT's perspective, this discrepancy means that procrastinators are characterized by a higher self-perceived social isolation than non-procrastinators. Feeling different than others may be associated with procrastinators' larger self – ideal discrepancy and higher level of depression which we discuss further when summarizing the findings regarding all three self-discrepancies.

Considering previous studies in procrastination, we believe that self – others discrepancy may also be a reflection of socially prescribed perfectionism – the belief that others have high expectations towards the person in question who is being critically evaluated by them (Hewitt & Flett, 1993). This belief would lead the person to experiencing an external pressure to be perfect.

Socially prescribed perfectionism has been shown to be maladaptive and associated with procrastination in contrast to self-oriented perfectionism (being intrinsically motivated to strive for perfection) which may be adaptive and does not correlate with this behavior (Flett et al., 1995; Klibert et al., 2005; Mushquash, & Sherry, 2012; Xie et al., 2018). Besides, procrastinators were found to feel that others did not like them and to search for their approval in a "needy" way (Ferrari & Díaz-Morales, 2007). On the other hand, we need to mention that Steel's (2007) meta-analysis revealed that the association of perfectionism with procrastination was not robust, although he might have obtained these results because of not dividing perfectionism into the two separate types mentioned above.

In conclusion, we believe that the provided arguments show that the role of self – others discrepancy, additionally to being an important novel finding in procrastination research, may contribute to understand better what has been described as socially prescribed perfectionism characteristic for procrastination. From PCT's perspective we may perceive the demand of perfection imposed on oneself as a search for validation and acceptance. A procrastinator could feel that they are different or even worse than important others, so they need to strive to be perfect because only this way will they get accepted, instead of being criticized and rejected. This vision goes in line with the self – ideal discrepancy described above – procrastinators are definitely not good enough in their own eyes – they lack an intrinsic, unconditional acceptance of themselves. Procrastination reinforces this self-invalidation constantly in their cycle of experience, this commonly resulting in shame and guilt (Giguère et al., 2016; Rahimi et al. 2016). They feel possibly different especially from the people who do not procrastinate and have a better self-esteem, so they need to win over their acceptance by being perfect which, unfortunately, is perceived as almost impossible to achieve and, thus, tasks which will be evaluated by others are set aside or postponed. On the contrary, those who do not procrastinate feel not only closer to their own ideal,

but as well to others, which most likely diminishes the necessity to be perfect in others' eyes – they simply do not need it to feel good about themselves.

When it goes to the third discrepancy measured by the RGT – the ideal – others one, there was no statistically significant difference between the two groups. However, there was a trend signaled by a small ES showing that procrastinators see others as more different from their ideal self than non-procrastinators. The additional correlational analysis showed small, though significant correlations of this discrepancy with GPS and AIP – two measures of behavioral procrastination. On the other hand, there was no significant relationship with decisional procrastination. To the best of our knowledge, this tentative finding is another novel one in the field of procrastination research and requires further investigation, so that it is verified if the difference in this discrepancy can reach statistical significance.

From PCT's perspective, the ideal – others discrepancy is interpreted, as we mentioned before, as the degree to which people see others as adequate. Hypothetically, it could be another dimension in which procrastinators' perfectionism interferes with their world view and relationships – not only would they see themselves different from their ideal and others, but as well other people would be seen as distant from their (unachievable) ideal. Overall, we can assume that self-discrepancies play an essential role in procrastination and are with no doubt an important topic to be explored further when studying this problem and RGT should be regarded as a convenient instrument that includes these and other measures of interest.

Curiously enough, the negative pattern in the self-discrepancies of procrastinators matches the one found by Feixas, Erazo-Caicedo et al. (2008) and Feixas et al. (2021) in two studies on various depressive disorders. Both procrastinators and depressed people had, in comparison to controls, a more negative self-image, saw themselves as more different from others, and saw others as more different from the ideal self. The negative view of self and the world (represented in the RGT by the element "others") are two aspects of the negative triad described in Beck's cognitive

model of depression (Beck, 2008; Beck & Bredemeier, 2016), the third one being the negative views about the future, not measured neither in the present study, nor in the ones of Feixas and colleagues. This constitutes an interesting resemblance between the characteristics of procrastination and depression. However, the logistic regression we performed (described in detail further below) indicated clearly that clinical symptoms, including depression, were not significant predictors of procrastination. Taking all this data into account, we believe that an alternative view of procrastination could be for it to be treated as a transdiagnostic phenomenon, similarly to the case of perfectionism as proposed by Egan et al. (2011).

When it goes to two other indexes extracted from RGT – cognitive polarization and interpersonal construct differentiation, there were no significant differences between the two groups. This lack of relationship was confirmed by the absence of significant correlations of either of these indexes with the three procrastination scales. The lack of difference in cognitive polarization means that procrastinators do not differ from non-procrastinators when it goes to cognitive rigidity or dichotomous thinking. In other words, the two groups turned out to be equally flexible at the cognitive level. Similarly, the lack of difference in interpersonal construct differentiation indicates that the two groups present a similar level of cognitive complexity – both procrastinators and non-procrastinators are able to construct reality in a multidimensional way. What is more, procrastinators scores on these two indexes are quite similar to the ones found by Trujillo (2016) for a community sample, with procrastinators presenting even slightly higher cognitive complexity. These results differentiate procrastinators from people with depression who were found to be more cognitively rigid (Neimeyer & Feixas, 1992; Feixas et al., 2021) and this rigidity, together with poorer complexity, has been associated traditionally with this disorder (Beck et al., 1979; Kelly, 1955/1991).

The absence of significant differences on these two indexes is in fact coherent with the vast majority of research which has not found any differences on cognitive flexibility or complexity

between procrastination and control groups (Steel, 2007; van Eerde, 2003). However, as we mentioned in the Introduction, there are as well some single studies that found procrastinators to be more rigid cognitively than non-procrastinators (Glick et al., 2014; Hailikari et al., 2021; Sutcliffe et al., 2018). Yet on the other hand, it was shown that conscientiousness, the main negative correlate of procrastination, was associated with cognitive rigidity (Stoycheva et al., 2020). Therefore, due to this ambiguity, future research into the role of cognitive polarization and interpersonal construct differentiation in procrastination is still recommended.

The last additional analysis performed in Study 1 was the logistic regression conducted with the objective of defining the best predictors of belonging to the procrastination group. In the initial model, we decided to include the self – ideal discrepancy (the strongest self-discrepancy when it goes to differentiating between procrastinators and non-procrastinators), ID presence (the strongest of the two variables regarding the importance of IDs when differentiating between the two groups), as well as DASS-21 and CORE-OM total scores, so that we would know if clinical symptomatology can influence the investigated prediction to some extent. Additionally, we included age and gender as well, so that their possible influence on the prediction model was controlled, especially when previous studies' results regarding gender differences in procrastination are not conclusive (Steel & Ferrari's, 2013; Limone et al., 2020; Sirin, 2011; Zhou, 2020; Rodarte-Luna & Sherry, 2008).

As we reported in the Results section, it came out in the final model that only self – ideal discrepancy and ID presence were able to predict belonging to the two groups and they did so for 80.6% of participants in the procrastination group and 72.1% in the control one. These results emphasize the vital role of negative self-image and having IDs in struggling with procrastination. The unique significant contribution of the latter variable to the model is a novel finding. At the same time, clinical symptoms, despite differentiating between procrastinators and controls, turned out to be non-significant when predicting belonging to these groups.

Self – ideal discrepancy and ID presence may possibly both cause procrastination as a protective solution for the construct system, as well as get reinforced by this problem and its consequences. Out of the two variables, self – ideal discrepancy was the stronger predictor which, interestingly, resembles the finding of Montesano et al. (2017) in the case of major depressive disorder. Similarly to the results obtained by these authors, we can see that, as well as in the case of procrastination, presenting IDs is an important and novel complement to the well-researched role of negative self-image in a problematic condition. While clinical symptoms are not a significant predictor of being a procrastinator, the resemblance of our regression model with the one for depression and the significance of depressive symptomatology in differentiating between the two groups should spark more interest in researching its specific role in procrastination, for example as its mediator or moderator.

Finally, we should add that while self – ideal discrepancy and ID presence are functionally related to each other because they both depend on the existence of discrepant constructs, the regression model showed that IDs are not a mere epiphenomenon that occurs alongside the primary self – ideal distance. On the contrary, this type of CCs turned out to be an important feature of procrastinators independently of the discrepancy. What is more, we need to remember that the sheer discrepancies in personal constructs are not enough for the construct system to become conflicted. What is required for an ID to emerge is a significant correlation with a congruent construct that reflects the important identarian aspects that are protected by the problem present in the discrepant one. In conclusion, we believe that our results show that the need for coherence and continuity, equally important as the desire to change, requires special attention in research and treatment of procrastination, in parallel with the appreciation of the well-established role of negative self-image.

Moving on to discussing the results of Study 2, we anticipated firstly that the brief cognitive therapeutic intervention would lead to a decrease in the level of procrastination and clinical symptoms (H2.1). This hypothesis was confirmed as the intervention yielded very satisfactory

results: the differences between pre and posttreatment scores were significant, with large ESs for all three procrastination scales as well as for DASS-21 and CORE-OM. Our results corroborate the findings regarding cognitive therapies' effectiveness in reducing procrastination (Malouff & Shutte, 2019; Rozental et al., 2018; van Eerde & Klingsieck, 2018), although the lack of a control group impedes to present a more valid comparison of treatment effects with those presented in previous research. The large ESs observed seem to support Malouff's & Shutte's (2019) meta-analytic finding that procrastination interventions for students as the specific collective and delivered in person (instead of online) is the optimal modality of treating this problem.

Van Eerde and Klingsieck (2018) found that CBT reduced procrastination to a larger extent than other therapeutic modalities and our results confirm this finding, taking into account that it was an important ingredient of the intervention delivered. At the same time, we believe the constructivist component played an important role in reducing procrastination as well, as it implemented the idiosyncratic, person-oriented approach which has been lacking and necessary in procrastination treatment, according to the meta-analysis of Rozental et al. (2018). In fact, our ESs turned out to be equal or higher than the average ESs found in the mentioned meta-analyses, which ranged from small (Rozental et al., 2018) to large (Malouff & Shutte, 2019; van Eerde & Klingsieck, 2018). The duration of our intervention was very brief (it included four 60-minute sessions) and it still yielded very significant decrease in procrastination which seems to confirm van Eerde's and Klingsieck's (2018) conclusion that treatment's duration (the mean total time of the analyzed interventions was 404 minutes) was not a significant moderator in the effectiveness of procrastination interventions. Unfortunately, we did not conduct a follow-up assessment which is one of the limitations of our study. However, we hypothesize that, similarly to van Eerde's and Klingsieck's (2018) finding for 23 combined ESs, there would be no difference between post-treatment and follow-up levels of procrastination.

When it goes to reducing the intensity of clinical symptoms, the large ESs for both scales showed that it was not merely an additional benefit of treating procrastination, but rather a substantial effect of receiving therapeutic help in the first place. These ESs were larger than the ones reported for secondary outcome measures by Rozental et al. (2018) in their meta-analysis. Our results confirm the hypothesis of these authors who stated that reducing procrastination may have an alleviating effect on other problems at the same time. The uniformity of the ESs across the changes in procrastination and clinical symptom scales corroborates as well our finding from Study 1, which showed significant associations between procrastination and these symptoms.

The additional exploratory analyses allowed us to understand on which subscales of DASS-21 and CORE-OM the largest changes were recorded. When it goes to DASS-21, only Stress (medium ES) and Depression (small ES) decreased significantly. However, the change in Anxiety, though non-significant, occurred in the predicted direction (signaled by a small ES), so we may anticipate that with a larger sample size it might reach statistical significance. In comparison, in their meta-analysis, Rozental et al. (2018) found medium ESs for anxiety, task anxiety, and depression as secondary outcome measures in procrastination treatment, although neither they nor the other aforementioned authors mention any results for stress.

On the other hand, it is worth noting that the Stress (especially) and Anxiety scores diminished to levels below the ones of the control group of Study 1, a change that corroborates the efficacy of our intervention. However, Depression, despite its significant decrease, stayed a bit above the level of that control group. It is positive then that despite this barely small decrease in depressive symptomatology, the participants were able to diminish their procrastination to a large extent. We may interpret it as possibly confirming the findings from Study 1 where it was found that factors such as self – ideal discrepancy and ID presence contributed to procrastination more than clinical symptoms. The decrease in procrastination further confirms these findings as it

happened in line with a significant decrease in self – ideal distance and a slight, though not significant, decrease in number of participants presenting at least one ID.

With regard to the changes in CORE-OM subscales, there was a significant decrease in the scores of Well-being (medium ES), Problems (medium ES), and Functioning (small ES). Interestingly enough, we can see here a similar pattern to the one observed in the case of DASS-21: the scores of the scale that was the principal one in differentiating between procrastinators and non-procrastinators (Depression in DASS-21 and Functioning in CORE-OM) were the ones that decreased less than the scores of the less predominant scales, as if it was more difficult to change on the variables that correlated with procrastination the most. A similar pattern is present if we additionally compare the post-treatment outcomes to the ones of the control group of Study 1. The Well-being and Problems scores decreased much below the level of that control group, while the post-treatment score on Functioning was still slightly higher than the one of controls. Nonetheless, the significant improvement in daily functioning and well-being, as well as having less problems, after the brief intervention can be considered as a success, and it seems to be a clear correlate of the large reduction obtained in procrastination. On the other hand, the lack of significant change in Risk should not be of much concern since the scores on this scale were low already at pre-treatment, so the possible floor effect might have limited the scope of change. Therefore, we may be satisfied with the fact that there was still a decrease on this scale in the predicted direction, signaled by a small ES. What is more, the scores at post-treatment were lower than the ones of the control group in Study 1. In sum, we can see that the brief cognitive intervention targeted at reducing procrastination, completed not only its main objective, but diminished as well (to a varying extent) participants' suffering on many dimensions, supporting the quality of the applied treatment and of psychotherapy in general.

When it goes to the second hypothesis of Study 2, we anticipated that the brief cognitive intervention would decrease the presence, number, and intensity of IDs (H2.2). This hypothesis was

rejected as there were no statistically significant differences in either of these indexes. However, approximately half of the participants who presented IDs at pre-treatment were able to resolve them. Hence, we may hypothesize that the briefness of the intervention prevented this resolution from occurring in a higher number of subjects. Moreover, while the number and intensity of IDs (measured by PICID) did not change significantly, the small ES signaled a decrease of these values at post-treatment. Here again, it is possible that a larger number of sessions could allow these changes to be more prominent and thus significant. We need to stress as well that IDs were not targeted and treated directly in this intervention like they are in dilemma-focused therapy. This may be the reason for why more participants did not resolve their IDs and the number and intensity of the latter did not diminish to a larger extent. On the other hand, the fact that approximately half of the sample did resolve their dilemmas, is congruent with the study of Hoyer et al. (2001) who found that CBT, despite not focusing explicitly on internal conflicts, may lead to their resolution through the cognitive changes and behavioral activation that promotes by facing the underlying dilemmas. We believe that the same might have happened for the constructivist ingredient of our treatment which was based on the intervention in personal meanings and thus promoted gaining awareness and transforming the conflictual schemas, even if these were not directly related to the IDs identified with the RGT.

Furthermore, the situation in which the level of symptoms is reduced after the treatment more than the presence, number, and intensity of IDs is alike the one described by Paz et al. (2016) who obtained similar results in the case of constructivist psychotherapy for anxiety. Such a pattern was noticed already by Holland et al. (2007) in their meta-analysis of personal construct therapy outcomes. Specifically, they found that the changes in the indexes of personal meaning showed smaller ESs than the ones in clinical symptoms. These authors hypothesize that it occurs because the behavioral change usually precedes the one in the cognitive structure, which validates our

assumption that a larger number of sessions or a follow-up assessment could reveal more satisfactory changes in these measures.

Our next hypothesis stated that the possible decrease in the number and intensity of IDs would correlate with the decrease of the intensity of clinical symptoms (H2.3). This hypothesis was rejected, as no significant correlations between the change in PICID and clinical symptoms scales or their subscales were identified. It occurred probably due to the lack of a large enough change in PICID – we may assume that if it had been significant, it would have correlated at least with the scales on which the participants achieved the most significant changes. Here again, the absence of direct focus on resolving IDs in our intervention might have influenced these results.

On the other hand, the following hypothesis, stating that the participants who have resolved their IDs would decrease their level of procrastination more than those who did not resolve this type of CC (H2.4), was partially confirmed. Specifically, this difference was large for GPS. At the same time, a similar tendency was signaled by a large ES in the other scale of behavioral procrastination, the AIP, although it was not statistically significant. However, taking into account that both scales correlated strongly with each other, we can conclude that resolving one's IDs made a difference regarding the decrease in behavioral procrastination. This, to the best of our knowledge is a novel finding and should be replicated with a larger sample. When it goes to decisional procrastination, there was no statistically significant difference in change on this score depending on resolving participant's IDs or not, but the tendency in the predicted direction, signaled by a medium ES, indicates that in this case the simultaneous dilemma resolution may have some effect as well. These results resemble the ones obtained by Feixas, Saúl et al. (2008) and Paz et al. (2017) who found that resolving IDs correlated with a bigger improvement on primary outcome measures in comparison to not resolving them. What is more, even though we are not able to define causality in this relationship, our results seem to be aligned with the findings regarding the significance of CCs in suffering in terms of clinical symptoms and distress (Escandón-Nagel et al., 2017; Feixas,

Montesano, Compañ et al., 2014; Montesano et al., 2015; Paz et al., 2017; Pueschel et al., 2011), reinforced as well by the results of Study 1. Further study of these relationships both with larger samples and including a control group could confirm our findings and provide more robust evidence for them.

The additional analyses in Study 2 regarded pre-post treatment differences in the RGT indexes not included in the hypotheses. When it goes to the self-discrepancies, participants improved their self-image by diminishing the distance between their present self and ideal self, with a large ES. What is more, they started construing themselves as more similar to others owing to the decrease of distance between their present self and other people, with a small ES. Hence, we can see that procrastinating students improved on both discrepancies in which we noted significant differences between procrastinators and controls in Study 1. However, in spite of the large ES in the change of self – ideal discrepancy, the participants did not reach the level similar to controls of Study 1 or those from the recent study of Feixas et al. (2021). Instead, the post-treatment level on this discrepancy situates them approximately half-way between depression and control groups of the latter study, and closer to procrastination than control group of Study 1. The same occurred in the case of self – others discrepancy. This means that even though the changes could seem satisfactory, there was still a wide margin for progress which could be possibly achieved with a longer treatment, in keeping with the aforementioned hypothesis of Holland et al. (2007).

Finally, there was no significant pre-post treatment difference in ideal – others discrepancy, although the change in the distance indicated a slight deterioration, signaled by a small, though almost negligible, ES. This means that others, representing the external world, seemed to be a bit less adequate in participants' eyes after the treatment. Due to the non-significance and a very small ES the value of this result is rather low, but it is still quite surprising. If it was confirmed in further studies, it could possibly mean that procrastinators, after diminishing their levels of procrastination and clinical symptoms, started to perceive others more negatively than when they procrastinated

chronically and felt worse. One possible explanation of this is that they got rid of their procrastination on the one hand, but still had perfectionistic expectations towards themselves and others on the other (let us remember that the remaining two discrepancies continued to be pretty high despite the therapeutic change). This hypothesis is reinforced by the fact that both pre- and post-treatment scores on ideal self – others discrepancy were not only much higher than the ones of the controls in the study of Feixas et al. (2021), but even higher than the depression group itself. They were as well higher than the scores of both groups of Study 1, so we may assume that not seeing others as adequate was a significant problem for the participants of Study 2, both before and after the received treatment.

With regard to the last two RGT indexes we measured, namely cognitive polarization and interpersonal construct differentiation, no significant changes occurred, though there was a trend in the decrease of cognitive polarization, signaled by a small ES. This means that the treatment caused, at least to a small extent, some flexibilization in how the participants construe themselves and their reality. In fact, the post-treatment score was lower than those of both groups in Study 1 and almost the same as the one of the control group in the study of Feixas et al. (2021), so we may conclude that when it goes to the level of cognitive flexibility our participants completed the treatment with scores similar to the general population. At the same time, the absence of change in interpersonal construct differentiation is not worrying as both pre- and post-treatment scores indicate a typical level of cognitive complexity (without unidimensional thinking), similar to the one found by Trujillo (2016) in a community sample.

5.2. Strengths and Limitations

Here we will discuss not only the strengths of the research presented in this thesis but also some limitations that influence the scope and generalizability of its results. When it goes to the strengths, the main one is that, to the best of our knowledge, our studies are the first ones to

empirically address the issue of internal conflict in procrastination and to investigate this problem from the perspective of PCT, using RGT as the assessment tool. Therefore, our approach is a novelty in procrastination research. The constructivist methodology we used allowed us both to confirm previous findings on procrastination correlates such as negative self-evaluation or specific clinical symptoms, as well as to provide new knowledge regarding the cognitive structure of students who procrastinate and the cognitive conflicts they struggle with.

We provided support for the role of self-discrepancies in procrastination, especially the self now – ideal self discrepancy which is thought to represent a negative self-evaluation pattern or low self-esteem and, as we found, plays a central role in procrastination. Additionally, we found that the self now – others discrepancy, representing perceived self-isolation, differentiates as well those who procrastinate from those who do not do it. This is a new finding which should advance the understanding of the self-view of procrastinators. The strength of our approach regarding self-discrepancies lies in the fully idiographic way of measuring them using RGT, in contrast to previous findings based on the use of standard methods such as self-report questionnaires using preestablished attributes based on the researcher's theoretical constructs.

Probably the most important novel finding in our studies is the central role of IDs in the cognitive structure of students who procrastinate. The strength of the conceptualization of internal conflicts in the form of IDs lies in the fact that it encompasses not only the need for change (expressed in the discrepant construct) but also the need for continuity (congruent construct), often omitted in previous research on procrastination and its treatment. Having this information for a given client who procrastinates is a valuable information for the therapist or counsellor in order to deal with this problem. At a more general level, further analysis of the content of these IDs may definitely deepen the understanding of internal conflicts of procrastinators and improve the ways of treating this problem.

Another advantage of the way we used the RGT with the participants of Study 1 is that they were able to become aware of their CCs. This occurred in the feedback session when the results of the assessment were presented to them. Our constructivist approach had the advantage of avoiding labelling or pathologizing procrastination. On the contrary, by presenting this problem as a coherent choice, it allowed the participants to engage in a compassionate view of their habit.

Overall, the use of RGT allowed us to elicit fully idiosyncratic, personal constructs which form part of these IDs. The idiographic, careful assessment involved in the RGT, although time consuming, can be considered an essential ingredient of our studies to achieve a personalized understanding of procrastination from the point of view of those who procrastinate. This is particularly useful for individualizing interventions targeting the specific ID of the client asking for help. But, at the same time, as seen across this dissertation and in many of the cited publications, the RGT provides measures that can be used to describe and compare groups, in a nomothetic way.

Moving on to limitations, one that needs to be mentioned regarding the sociodemographic questionnaire is that we included only “male” and “female” options to be chosen from when it goes to participants’ gender. Even though we doubt that any significant changes would have occurred after adding more options, these should be included in future research with no doubt. Another limitation when it goes to the sociodemographic and clinical data is that we did not control the sample for the presence of comorbid psychiatric diagnoses (such as ADHD or major depression disorder) or significant somatic problems that could possibly mediate or moderate participants’ procrastination.

Furthermore, psychology students were overrepresented in our samples, accounting for 81.3% of the sample in Study 1 and for 64.3% in Study 2. However, to the best of our knowledge, there is no clear evidence that representatives of certain fields of study procrastinate more than others, so we assume that this limitation did not influence much our results. The fact that psychology students were a majority among our participants may explain as well why there were

more females than males in the samples. Nevertheless, as we mentioned before, no significant differences in gender distribution among groups were found in Study 1 in which, if present, they could have influenced the results and would have been controlled for.

To conclude with limitations regarding the demographics, one could pinpoint that our studies were yet another ones that recruited only students. This clearly limits the generalizability of our results to populations other than students. However, taking into account the fact that this is the population that suffers from procrastination the most, we think that it is important to better understand the cognitive structure of procrastinating students and help them on time, so that they do not bear this habit with them to the subsequent stages of their lives.

When it goes to other limitations, probably the main one is that Study 1 had a cross-sectional design which limited the exploration of causal relationships between the variables. Thus, we cannot assume that, for example, the presence of implicative dilemmas in the cognitive structure of a student is the cause of their procrastination. On the other hand, we employed a longitudinal design in Study 2. The brief format of the applied treatment had the advantage of making it more likely to attribute the acquired changes to the intervention rather than to possible external factors. At the same time, our results seem to indicate that a more potent intervention, possibly with a larger number of sessions, could yield more significant changes.

The number of participants and convenience sampling may be considered another limitation of our studies. Nevertheless, in the case of Study 1 we were able to satisfy the requirements of sample size estimation when it goes to finding an ES of a similar magnitude to the ones found in previous research on the main outcome measure. However, this may not be the case for other calculations, so future research should consider increasing the sample size. The same improvement should be applied if Study 2 was to be replicated.

Another limitation of Study 2 was that there was no follow-up assessment session six months (or one year) after concluding the intervention with the booster session conducted one

month after the three weekly consecutive sessions. Such assessment could have examined the robustness of the change achieved by the participants, especially the possible crystallization of the changes in their cognitive structure. Similarly, lack of a control group in which there would be no therapeutic intervention applied decreases the possibility of attributing the observed effects to the therapeutic intervention. Moreover, using a different specific treatment as a control group would allow to attribute the differential outcome (if found) to the quality of the cognitive intervention used.

The instruments we used present some constraints as well. When it goes to the procrastination questionnaires, their lack of clearly established cut-off points may be considered a limitation. However, we were able to solve this problem by using mean score for the Spanish population which made sense as almost all our participants were citizens of Spain.

Finally, the RGT, despite its vast advantages, presents some limitations as well. Firstly, it assesses only verbal constructs, omitting the importance of the non-verbal ones, even though the PCT proposes the existence of the latter type. Secondly, in Study 2, at post-treatment the participants were scoring the same constructs that were elicited in the pre-treatment assessment. It was done so in order to maintain the internal validity of RGT across the two measurements. However, this approach made it impossible to examine if there were any changes regarding the appearance of new constructs or poles, as well the potential loss of meaning in the constructs used to describe participants' reality in the first place. An interesting way of solving this problem in future research would be to first use the same grid at post-treatment and then to create a completely new one, eliciting possibly new constructs and maybe even including new elements. This way we would be able to check if there are any relevant differences between the two grids. All in all, despite these limitations, RGT has showed its utility and offers many advantages in research and therapeutic practice, the main one being revealing the subjective construction of self, others, and

personal goals, together with the idiosyncratic conflicts that may be responsible for precluding therapeutic change.

5.3. From Research to Practice

Our research confirms the importance of viewing procrastination as a serious, complex problem. Hence, we believe it should be investigated and treated clinically (or in student support programs) taking into account its various facets, delineated in this dissertation. With the aim of facilitating the work of psychotherapists and other professionals who help those who procrastinate, we present below some tentative guidelines for the assessment and treatment of procrastination.

Firstly, we encourage these professionals to incorporate the concept of internal conflict in their interventions dealing with procrastination. As we have demonstrated, the need for continuity and coherence plays an essential role in one's construct system and will most probably block the desired change when there is an association between this change and the consequential loss of coherence. Therefore, helping people discover and become aware of their CCs is, according to us, a vital initial step in the process of change. Our results along with the other studies mentioned above suggest therapists that if their client have one or more IDs they would be better off being aware of and tackling this conflict(s) if they want change to go more smoothly.

We strongly encourage investigate IDs using RGT. The approach that incorporates the RGT directly into the assessment and therapeutic process is the DFT, mentioned already in section 5.1. However, RGT may be applied for the identification of CCs independently of the specific therapeutic approach preferred by the therapist. As long as the clinician is open towards the constructivist epistemology, which is the fundament of this method, it may be incorporated relatively easily (after some training on its application) into the the toolbox of therapists of virtually all orientations. Nevertheless, RGT is not the only way of discovering CCs (Feixas, 2016). One may do it as well conversationally by focusing on the elements of clients' narrative that may indicate the

existence of internal conflicts. Another way is to use specific techniques, both cognitive and experiential that will facilitate the discovery, integration, and resolution of the dilemmas. Such methods are offered both within the realm of PCT and its present incarnations (Feixas, 2016; Neimeyer, 2009), as well as by other approaches inspired by constructivist thinking, like the aforementioned coherence therapy or the immunity to change model.

We strongly believe (and hope evidence from future studies will support this conviction) that implementing the concept of IDs in the psychotherapy process may increase the effectiveness of interventions by taking into consideration the positive, adaptive features of procrastination (and other symptoms). This "coherence empathy", as Ecker et al. (2012) call it, is an essential attitude both for the therapist and for the client who, according to us, are likely to fail in the process of change if counteractive techniques are applied with little or no understanding of the coherence of the symptoms.

When working with IDs in procrastination treatment, we recommend focusing not only on the conflicts that include this problem in the discrepant construct. As we have seen, only a fourth part of all IDs presented by procrastinators refer directly to this symptom. We hypothesize that procrastination may be an effect of other conflicts as well, for example those referring to one's values and core identarian constructs. Therefore, it is important to explore all the IDs with the client and work with them towards their resolution, so that the change in the personal construct system is as comprehensive as needed.

Because of the nature of IDs, working with them might decrease the discrepancies in the construct system and, in consequence, improve the way the clients view themselves and others, thus increasing their sense of well-being. However, taking into account the central role of the self – ideal discrepancy in procrastination, we recommend as well putting special attention to improving clients' self-worth evaluations. This can be done by showing appreciation for core internal conflicts that give adaptive meaning to maintaining low self-worth. We believe that resolving these conflicts

will break the vicious cycle of self-invalidation and increase the chances of diminishing the habit of postponing, thus leading to a sense of higher self-esteem and self-efficacy which may originate a new cycle – this time a virtuous one, thus decreasing the risk of procrastination. Similarly, focusing on the self – others discrepancy and decreasing clients' sense of isolation or feeling different than other important people in their lives may, as our results suggest, reduce the need for procrastination. Finally, the fact that procrastinators not only see themselves, but as well others (at least to some extent) as far from their ideal self should be investigated additionally as a possible sign of perfectionistic tendencies. Should this hypothesis be confirmed in the course of therapy, the meaning and function of perfectionism need to be addressed as well.

When working with people who procrastinate, we must not forget about the real suffering that comes along with it. Depression (especially), anxiety, and stress are symptoms that need to be addressed in procrastination treatment. From a constructivist stance, we recommend treating them as well with a "credulous approach", trying to understand their meaning according to each client's unique personal construct system, while helping them to decrease these symptoms' intensity in parallel. The impaired functioning must not be overlooked either. In the case of this problem, the well-researched methods stemming from CBT or self-regulation methods may be an important ingredient of procrastination treatment, as long as they are not imposed in a counteractive way, always bearing in mind the possible resistance to change that can arise if we accidentally "attack" clients' need for coherence. Finally, the debilitating problems that correlate with procrastination (such as relational or financial difficulties) should be addressed empathically as well, always taking into account the broader, biopsychosocial context surrounding our clients. Additionally, it should be taken into consideration that decisional procrastination correlates with more suffering than the behavioral one, so special attention should be paid to working with indecision and the conflicts related to it.

Taking all the above recommendations into account, we believe, in accordance with Steel and Klingsieck (2016), that it is important to design effective, custom-tailored interventions for procrastination treatment. Whereas they suggest adapting the treatment to the "type of procrastinator", we think that the flexibility of such an idiographic approach should lie in looking for the very subjective, personal meanings of procrastination, and intervening at the level of these meanings, avoiding counteractive techniques and taking special care of people's need for psychological continuity. The abovementioned guidelines may become pillars of such a therapy. This treatment, based on DFT, could become an independent program or an add-on to existing approaches, such as CBT (for a study testing the efficacy of combining DFT and CBT in the treatment of depression, see Feixas et al., 2016), powered with the transformative potential of dilemma resolution.

5.4. Future Research

The results of our studies can motivate further research on the role of CCs in procrastination and its treatment. First of all, as we mentioned in section 5.2., our sample sizes might have been too small for some of the analyses performed, so future studies with larger samples are recommended. Our results clearly encourage such replication. Moreover, better control of possible comorbidities would be an improvement factor in subsequent studies.

When it goes to future cross-sectional research, larger samples could provide more insight into the novel findings presented in this dissertation, especially when it goes to the role of the presence of IDs and self – ideal discrepancy in differentiating between procrastinators and non-procrastinators. More research is needed as well regarding the self – others discrepancy which we found to be bigger in students who procrastinate. The trend in the difference we found in the ideal – others discrepancy should be further investigated as well and it could be studied if all the three distances treated as a general variable of self-discrepancy are a characteristic of those who

procrastinate. To further refine the results of Study 1, structural equation models may be used in order to examine the mediating and/or moderating role of cognitive structure variables and clinical symptoms in procrastination, similarly to what was done in the case of psychosis by García-Mieres et al. (2020).

More studies on the specific role of IDs in procrastination are definitely needed. One interesting line of research would be to analyze the content of these IDs and other constructs from the RGT and organize them in a theoretical framework. As we have mentioned above, barely one in four discrepant constructs in procrastinators' IDs refers directly to procrastination. However, probably other constructs are related to this behavior and its facets in a less direct way. The content analysis system designed by Feixas et al. (2002) makes it possible to classify all constructs extracted from the RGT into specific categories and have a qualitative look at them. Creating such a network of meanings could help to understand the idiosyncratic meanings that procrastination has for each person and which of these meanings may be blocking the change in procrastination and to tailor interventions with more precision, this way preparing the therapists and other professionals to address the specificities of the personal construct system of procrastinators.

Content analysis can be used as well to better understand the change (and/or its absence) in personal constructs after therapy. For this aim, longitudinal studies could include comparing constructs' content before and after the intervention. As we have mentioned before, creating a completely new grid after the intervention would provide more insight regarding the change in personal meanings, and content analysis could be very beneficial in this process. To corroborate the results of procrastination treatment, a follow-up assessment should be added to the protocol, including another RGT application. We need to stress again the importance of having a control group that would not be receiving any therapy (e.g., a waiting list group), or a different active treatment, so that the results of the intervention can be fully attributed to the received treatment.

The final recommendation for analyzing the content of constructs regards the cognitive structure of those who do not procrastinate. We know from past research that these people are self-disciplined (the most prominent facet of conscientiousness to correlate inversely with procrastination), feel self-efficacious, and avoid self-handicapping (van Eerde, 2003). However, we know little about their subjective construction of reality. Hence, analyzing the content of their personal constructs could advance our capacity of helping procrastinators by guiding them towards generating new meanings coherent with a construction of reality that does not "require" the presence of procrastination.

From a systemic-constructivist point of view (Procter & Winter, 2020; Ugazio, 2013), it would be interesting to analyze the meanings of procrastination at the level of family of origin. Similarly to Medina's (2018) study on happiness in depression, we recommend analyzing the RGT output in terms of procrastination (or its absence) attributed to parents and optionally even siblings. Such an exploration of the family network of meanings would make it possible to define parents' possible influence on children's procrastinatory behavior. The results of such a study could be compared with the results of the research of Zakeri et al. (2013) who found that strict behavioral supervision of the parents predicted procrastination in their offspring. On the other hand, parenting styles denominated as "acceptance-involvement" and "psychological autonomy-granting" were found to be significant predictors of lack of procrastination. Analyzing the content of personal constructs we would be able to explore if any of these parenting styles are attributed to parents and see how they correlate with respondents' procrastination.

Another interesting line of research could involve comparing the effectiveness of therapies that are specifically focused on resolving IDs related to the presenting problem (in our case, procrastination), such as DFT, to other approaches (such as narrative therapy or solution-focused brief therapy) that can also address procrastination but, in doing so, the latter do not mention working on internal conflicts at all. This proposal is inspired by the study of Feixas et al. (2016)

who found that conflict resolution is not a distinctive feature of any specific approach but may possibly occur in many models of therapy. A similar design could be used in comparing DFT or other non-counteractive constructivist approaches that focus on resolving internal conflicts, such as coherence therapy, with counteractive models used in procrastination treatment, for example CBT or self-regulation interventions. Yet another option when it goes to randomized controlled trials would be to follow the line of research proposed within the MDP (Feixas et al., 2016; Feixas et al., 2018) and check if adding a dilemma-focused intervention to other approaches would improve the effectiveness of such a therapy in reducing procrastination and decreasing the number and intensity of IDs.

The versality of RGT as an instrument that can be used together with a wide variety of therapeutic interventions is a big advantage that should encourage researchers to apply it to study changes in cognitive structure. Both randomized controlled trials as well as a process-oriented, qualitative research approach could help to specify which treatment and specific interventions are most effective in dilemma resolution and simultaneous procrastination reduction. These findings could lead to creating new treatment manuals which would be built on a strong, research-based framework of concrete phases and interventions, while allowing for flexibility and custom-tailoring the process according to the person's needs at the same time.

When it goes to the populations of those who procrastinate, it would be informative to compare the cognitive structure and conflicts of procrastinating students and older adults. We know in fact, as we mentioned in chapter 1, that procrastination usually decreases with age. Therefore, both cross-sectional and longitudinal studies could be designed so as to provide information on how the personal construct system of those who procrastinate differs according to age and changes as they grow older. This line of research, maybe adding a qualitative inquiry to a longitudinal study, could also provide insights on how young people who procrastinate overcome this difficulty in their natural process of evolution, without specialized or professional help.

On the other hand, our results indicated that indecision can be an especially debilitating form of procrastination, linked with significant suffering, so we suspect that it may be related to particular CCs that make it impossible to simply make decisions and turn them into action. Hence, further research on deeper features of decisional procrastination, the direction of its possibly causal relationship with clinical symptoms, as well as the IDs related to it could shed more light on this problem. This, in turn, could lead to creating specific interventions aimed at resolving these internal conflicts.

Finally, similarly to Rozental and Calbring (2014), we recommend conducting more research on clinical utility and test-retest validity of the procrastination scales used in our research. When it goes to measuring procrastination, future studies could investigate the strength of correlation between the results obtained in these self-report questionnaires and the rating of the procrastination construct in RGT. If this relationship was to be strong, it would mean that the score on the idiographic construct related to procrastination is a valid way of measuring this problem and could be included in further research.

6. Conclusions

The main objective of this dissertation was to study the cognitive structure and conflicts (specifically IDs) of students who procrastinate. For this aim, students who procrastinated (recruited using convenient, non-probabilistic sampling) were compared to a control group of students who did not present this problem (Study 1). The socially important problem of procrastination was approached from a constructivist perspective, specifically through the lens of PCT. Its flagship measurement tool, the RGT, was used to obtain data regarding the personal construct systems of the participants. Relationships of various variables of cognitive structure and conflicts with procrastination and clinical symptomatology were analyzed. In Study 2, the change on these dimensions after a brief cognitive therapeutic intervention was investigated.

When it goes to the hypotheses of both studies, confirmatory results were found. We came across novel and challenging findings as well. The results were described extensively in the previous chapter, together with the strengths and limitations of our studies. Practical implications of the results were discussed and future lines of research were proposed as well. Considering all this information, the following conclusions are drawn as a summary:

1. As we expected, significantly more students who procrastinated presented IDs in comparison to those who did not procrastinate. The percentage of participants with IDs in the first group was high and similar to the ones found in various clinical conditions. This fact, joined with the rest of our results, suggests that procrastination could be viewed as a clinically significant problem or, alternatively, as a transdiagnostic phenomenon. On the other hand, the control group presented IDs as well, though in a much lower percentage that was comparable with control groups from other studies. Additionally, procrastinators presented a higher number and intensity of IDs. These results confirmed the expectation that IDs would play an important role in procrastination which is a novel finding in procrastination research.

2. When it goes to another aspect measured by the RGT, the self-discrepancies, procrastinators presented a much more negative self-image (expressed in a high self – ideal discrepancy) than the control group. This means they did not seem themselves as adequate in the light of how they would like to be. This result confirmed both our hypothesis and the results reported in previous studies in terms of procrastinators' low self-esteem and self-efficacy. Additionally, and to our surprise, procrastinators turned out to see themselves as significantly more different from significant others in comparison to the control group. This discrepancy can be seen as self-perceived social isolation and is a novel finding regarding procrastination. Furthermore, a trend (though non-significant) was found in the between-group comparison on the ideal self – others discrepancy, indicating that procrastinators might see other people as inadequate, though not so much as themselves. If this finding is confirmed in future research, it would be another novel conclusion in procrastination research.

3. Our results indicated that procrastinators suffered from clinical symptoms more than non-procrastinators, which confirmed the set hypothesis and extant literature. The largest differences regarding particular subscales were found on Depression (in DASS-21 questionnaire) and Functioning (in CORE-OM). Additionally, it was found that decisional procrastination correlated more with these symptoms than the measures of behavioral procrastination did, which deepens the knowledge on different facets of procrastination and should be further investigated.

4. Among the various variables investigated, only self – ideal discrepancy and ID presence were able to predict belonging to the procrastination group, the first one being the strongest predictor. No other variable of cognitive structure, clinical symptoms, gender, or age turned out to be significant predictor in this case. This finding emphasizes the essential role of self-esteem (or self-concept, in broader sense), but also of IDs in procrastination, and should motivate more research in this field, especially considering that the latter is a novel finding.

5. The brief cognitive intervention resulted in a significant decrease in the levels of procrastination and clinical symptoms, confirming our hypothesis and previous findings on the effectiveness of psychotherapy for procrastination (independently of its length). The decrease in the intensity of clinical symptoms confirmed the alleviating effect that procrastination therapy is thought to have on them.

6. Contrarily to our anticipations, no significant decrease in the presence, number, and intensity of IDs was found after the brief therapeutic intervention. However, approximately half of the participants resolved their IDs and the number and intensity of these CCs diminished slightly as well. Therefore, considering previous research, we may anticipate that an intervention containing more sessions could lead to significant changes on these dimensions.

7. The decrease in the number and intensity of IDs did not correlate with the decrease in the intensity of clinical symptoms which made us reject that hypothesis. This occurred possibly since the intervention was not focused on resolving the specific CCs found in participants' repertory grids. A dilemma-focused intervention for procrastination could be developed and tested in further studies.

8. On the other hand, and according to our anticipations, the participants who resolved their IDs reduced their procrastination more than those who did not resolve their IDs, although not reaching statistical significance in all the used scales. This is a novel finding in procrastination research. It further confirms the important role of IDs in procrastination as revealed in Study 1.

9. After the brief cognitive intervention procrastinators improved their self-image (by reducing the self – ideal discrepancy) and diminished their sense of self-perceived isolation (by reducing the self – others discrepancy). Nonetheless, their self-discrepancies were still more characteristic for the ones of procrastinators than controls, so further improvement would be expected with a longer, more efficacious intervention.

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8. Annexes

Annex 1. Sociodemographic questionnaire

Data de avaluació: _____ Codi participant:_____

Nom:_____

Avaluador(es):_____

DADES SOCIODEMOGRÀFIQUES

<table>
<tr><td>Sexe:
□ 1. Home □ 2. Dona</td><td rowspan="3">Estat Civil:
□ 1. Solter
□ 2. Casat
□ 3. Divorciat/Separat
□ 4. Vidu</td></tr>
<tr><td>Edat: _____</td></tr>
<tr><td>Te actualment parella:
□ 1. Si
□ 2. No</td></tr>
<tr><td>Durada de la relació: (si inferior a 1 any, especificar el nombre de mesos _____)
□ 1. Menys d’un any
□ 2. Entre 1 any i 2 anys
□ 3. Entre 2 anys i 5 anys
□ 4. Entre 5 i 10 anys
□ 5. Entre 10 i 15 anys
□ 6. Entre 15 i 20 anys
□ 7. Més de 20 anys</td><td>Durada de la convivència: (si inferior a 1 any, especificar el nombre de mesos _____)
□ 1. Menys d’un any
□ 2. Entre 1 any i 2 anys
□ 3. Entre 2 anys i 5 anys
□ 4. Entre 5 i 10 anys
□ 5. Entre 10 i 15 anys
□ 6. Entre 15 i 20 anys
□ 7. Més de 20 anys</td></tr>
<tr><td>Nº fills: _____</td><td rowspan="2">Últims estudis realitzats:
□ 1. Primaris
□ 2. Intermedis
□ 3. Universitaris

Estudis actuals:
Universitat:_____
Facultat:_____
Grau/Licenciatura:_____
Año:_____
Horari: mati □, tarda □</td></tr>
<tr><td>Situació laboral:
1. Treballa actualmente □
2. No treballa. □
Des: mes /os..... Any / s.....
3. En qué treballa: _____</td></tr>
<tr><td colspan="2">Tractament psicològic previ: Si □ No □
A quina edat? : _____
Quin tractament? : _____
Per quin motiu?: _____
Diagnòstic / s previs / s: _____
Actualment està rebent algun tractament psicològic o psicofarmacològic? Si □ No □
Quin tractament? : _____
Per quin motiu?: _____
Des: mes /os..... Any / s.....
Diagnòstic : _____
Consum de Alguna Substància: alcohol □drogues□ qual?_____ freqüència:_____</td></tr>
<tr><td colspan="2">Considerant tots els aspectes, quin grau de satisfacció té amb la seva vida en general?
En una escala del 1 al 10: _____</td></tr>
</table>

Annex 2. Spearman correlations matrix for all continuous variables of Study 1

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. PICID	—																	
2. AIP	0.37***	—																
3. DPS	0.26**	0.66***	—															
4. GPS	0.40***	0.85***	0.73***	—														
5. CORE-OM total	0.22*	0.31***	0.45***	0.33***	—													
6. Depression	0.23*	0.31***	0.51***	0.36***	0.76***	—												
7. Anxiety	0.11	0.12	0.25**	0.17	0.62***	0.45***	—											
8. Stress	0.07	0.16	0.32***	0.17	0.69***	0.54***	0.62***	—										
9. DASS-21 total	0.17	0.21*	0.41***	0.26**	0.83***	0.78***	0.77***	0.89***	—									
10. Well-being	0.14	0.14	0.37***	0.18*	0.86***	0.71***	0.51***	0.63***	0.75***	—								
11. Problems	0.19*	0.29***	0.42***	0.30***	0.94***	0.73***	0.68***	0.72***	0.85***	0.83***	—							
12. Functioning	0.20*	0.41***	0.52***	0.41***	0.88***	0.70***	0.54***	0.54***	0.70***	0.67***	0.76***	—						
13. Risk	0.18*	0.19*	0.23**	0.23**	0.55***	0.45***	0.40***	0.45***	0.54***	0.46***	0.53***	0.47***	—					
14. Self - ideal distance	0.49***	0.55***	0.56***	0.60***	0.46***	0.41***	0.24**	0.35***	0.40***	0.39***	0.40***	0.46***	0.32***	—				
15. Self - others distance	0.29***	0.28**	0.17*	0.25**	0.27**	0.14	0.05	0.19*	0.17	0.18*	0.21*	0.23**	0.16	0.43***	—			
16. Ideal - others distance	0.27**	0.22*	0.09	0.19*	0.02	0.05	-0.04	0.08	0.06	-0.09	0.02	0.06	0.09	0.25**	0.47***	—		
17. Polarization	0.09	-0.16	-0.14	-0.11	-0.09	-0.12	0.01	0.12	0.00	-0.08	-0.06	-0.21*	-0.11	0.02	0.23**	0.18*	—	
18. PVEFF	0.09	0.05	0.08	0.10	0.04	-0.01	0.04	0.01	0.03	0.04	0.03	0.05	-0.02	0.03	-0.05	0.12	0.03	—

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

Annex 3. Fields of study of participants in Study 1 and 2

Table A 1

Fields of Study of Participants in Study 1

	n (%)
Psychology	104 (81.3)
Anthropology	4 (3.1)
History	2 (1.6)
Pharmacy	2 (1.6)
Pedagogy	2 (1.6)
Biology	1 (0.8)
Criminology	1 (0.8)
Economy	1 (0.8)
Education	1 (0.8)
Social education	1 (0.8)
Philology	1 (0.8)
History of art	1 (0.8)
Informatics	1 (0.8)
Mathematics	1 (0.8)
Mechanics	1 (0.8)
Medicine	1 (0.8)
Political science	1 (0.8)
Chiropractic	1 (0.8)
Sociology	1 (0.8)
Total	128 (100)

Table A 2

Fields of Study of Participants in Study 2

	n (%)
Psychology	18 (64.3)
History	2 (7.1)
Pharmacy	2 (7.1)
Biology	1 (3.6)
Philology	1 (3.6)
History of art	1 (3.6)
Informatics	1 (0.8)
Mathematics	1 (0.8)
Mechanics	1 (0.8)
Total	28 (100)

Annex 4. List of tables and figures

Tables

Figures

Annex 5. List of abbreviations

- ADHD: Attention Deficit and Hyperactivity Disorder
- AIP: Adult Inventory of Procrastination
- ANOVA: Analysis of Variance
- CBT: Cognitive Behavioral Therapy
- CC: Cognitive Conflict
- CORE-OM: Clinical Outcomes in Routine Evaluation – Outcome Measure
- C-P-C cycle: Circumspection-Preemption-Control cycle
- DASS: Depression Anxiety Stress Scales
- DC: Dilemmatic Construct
- DPS: Decisional Procrastination Scale
- DSM: Diagnostic and Statistical Manual of Mental Disorders
- ES: Effect Size
- GPS: General Procrastination Scale
- ID: Implicative Dilemma
- MANOVA: Multivariate Analysis of Variance
- MDP: Multi-Center Dilemma Project
- PCT: Personal Construct Theory
- PICID: Percentage of Intensity of Constructs of Implicative Dilemmas
- PVAFF: Percentage of Variance Accounted by the First Factor
- REBT: Rational Emotive Behavior Therapy
- RGT: Repertory Grid Technique
- SD: Standard Deviation
- TMT: Temporal Motivation Theory