



**The effect of a novel self-determination theory based writing exercise in increasing self-determination and perceived self-competence in goal setting:**

**A randomized experiment**

Katie Mulvany

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Supervisor: Dr Ronda Barron

Course Director: Cathal O'Keefe

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Department of Psychology

Dublin Business School

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### **Abstract**

A novel reflective writing exercise based on self-determination theory was created, applied, and assessed within the current study. The study aimed to examine the potential for this exercise to increase participants self-determination and perceived self-competence in relation to their long-term goal. 155 participants took part in the study, with 84 participants receiving the self-determination theory based reflective writing exercise, while the control condition (n = 71) received a control intervention. Total self-determination score and perceived self-competence were assessed at baseline, and again following the intervention. A mixed two way ANOVA revealed a significant increase in the intervention conditions total self-determination, while the control condition showed no significant change. A Mann Whitney U test and a Wilcoxon signed rank test revealed that both the experiment and control condition showed significant increases in perceived self-competence following the intervention. No gender or age differences were evident in relation to the effectiveness of the intervention for the experiment condition. Limitations and recommendations for future research are discussed.

## 1. Introduction

The study of motivation is ubiquitous within the field of psychology (Heckhausen, 2018). The term *motivation* derives from the Latin verb *movere*, meaning *to move*, which reflects the overarching conceptualisation of motivation within the research as the desire to move towards a change in one's self or environment (Reeve, 2018). It was articulated by Reeve (1993, p. 354) that motivation can be understood as something which “gives behaviour its energy”. However, the literature indicates that motivation is not simply as a means of initiating change per se. For instance, research has shown that motivation is also a key psychological factor involved in promoting learning engagement (Breslin, Liston, Prentice, McLaughlin & McConnell, 2013), predicting successful outcomes for tasks (Alizadeh, 2016), and promoting greater life and career satisfaction (Kuvaas, Buch, Weibel, Dysvik, & Nerstad, 2017; Nwankwo, Okeke & Okeke, 2018). Furthermore, increased motivation has been linked to health benefits such as higher levels of psychological wellbeing, happiness, and lower levels of anxiety and stress (Khoshnam, & Gendavani, 2013). Research has also examined the relationship between motivation and depression, indicating that a lack of motivation may lead to depression, contrariwise a common symptom of depression is decreased motivation (American Psychiatric Association; 2013; Kunanithaworn et al., 2018). Furthermore, research by Piumatti (2018) argues that higher levels of motivation acts as a protector against depression in young adults. Taking the motivation literature into consideration, it can be understood that the study of motivation is an important and valuable area within psychology, thus interventions which may enhance or maintain motivation have a strong applied value.

## 1.1 Self-determination

To date, psychological research has provided various theories which define and describe motivation. However, in introducing self-determination theory (SDT), Ryan & Deci (2000) outline how it is not necessarily the strength of one's motivation that is important, but rather the type of motivation that the individual is experiencing. This component of SDT distinguishes it from most previous theories of motivation, which tend to describe motivation as being a "unitary phenomenon", in which motivation is defined as being something an individual either has or does not have (Ryan & Deci, 2000, p. 54). Ryan and Deci (2020) postulate that it is indeed true that one's levels of motivation can be subject to change; however, there are different subcategories of motivation. This concept ultimately underlies the SDT of motivation. The subcategories can be broadly described as intrinsic motivation or extrinsic motivation (Deci & Ryan, 2000).

Early research on self-determination focused heavily on the concept of intrinsic motivation, assuming it to be an innate and essential component of human growth and development (Ryan & Deci, 2000). Intrinsic motivation relates to activities and goals which are pursued due to the individual's personal curiosity, desire to learn, and desire for personal growth and achievement (Breslin et al., 2013). This type of motivation relates to motivation which induces a sense of mastery, accomplishment, or self-fulfilment (Fang, Gerhart & Ledford, 2013). SDT has also been investigated within academic settings, with studies indicating that students who display higher levels of intrinsic motivation show higher levels of learning enjoyment (Alizadeh, 2016), perform better academically (Adamma, Ekwutosim & Unamba, 2018), and exhibit less academic related anxiety (Froiland & Warrel, 2016)) than students who display extrinsic motivation. Each of these findings highlights the importance of research in examining the promotion and maintenance of intrinsic motivation.

SDT is a theory of human development which posits that humans have an innate need for psychological growth and to feel intrinsically motivated; however, in order to fulfil this inherent need, the individual's basic psychological needs of autonomy, relatedness and competence must be satisfied (Ryan & Deci, 2020). *Autonomy* relates to the extent to which the individual experiences a sense of ownership over their own choices, and is fundamental to acquiring a high level of self-determination (Ryan & Deci, 2000). *Relatedness* relates to the extent to which the individual feels supported and accepted by their environment and peers. Finally, *competence* relates to the individual's belief that they are capable of accomplishing the task or goal at hand (Ryan & Deci, 2017). An individual's perceived self-competence is not only an important aspect of SDT, but it is also reported as being associated with lower levels of anxiety and depression, better academic performance (Huerta, Goodson, Beigi & Chlup, 2016; Lane & Lane, 2001), higher levels of happiness and life satisfaction (Bardeen & Fergus, 2019; van Zyl & Dhurup, 2018), and better task persistence (Baier, Markman, & Pernice-Duca, 2016). Ryan and Deci (2000; 2020) argue that although the fulfilment of the three basic psychological needs allows individuals to experience higher levels of intrinsic motivation, that is not to say that a person will be intrinsically motivated in every activity they choose to engage in. The type of motivation which underlies the person's decision to pursue the goal or activity relates to their perception on whether they are engaging out of curiosity and desire to learn and grow, or because they feel compelled to do so.

Extrinsic motivation refers to activities and goals which are pursued due to the influence of external factors. Such examples of externally motivating forces include money, fear of failure, rewards, expectations, or pressure from others (Breslin et al., 2013; Ryan & Deci, 2000). In early research, extrinsic motivation was portrayed as being the opposite of intrinsic motivation, often being understood as motivation which is solely fuelled from the pressure or expectations from external stimuli. However, more recent SDT literature further defines this



category of motivation. Although it is true that extrinsic motivation can be characterised as the motivation that one experiences while carrying out an activity out of obligation, it would be inaccurate to state that all types of extrinsic motivation are non-self-determined (Ryan & Deci, 2017; Mullan & Markland, 1997). SDT puts forward four different behavioural regulation styles which depict the extent to which one's extrinsic motivation has been internalized (Ryan & Deci, 2017). In order to expand upon this concept of internalization, Ryan and Deci (2000) proposed the self-determination continuum.

## 1.2 The self-determination continuum

The self-determination continuum portrays the various types of motivation which an individual can experience in relation to their personal levels of self-determination. The Likert-type continuum ranges from the lowest level of self-determination, *amotivation*, to *intrinsic motivation* (Deci & Ryan, 1985; Ryan & Deci; 2000, 2002). The subscales between amotivation and intrinsic motivation displays the four categories of extrinsic motivation which one may experience respectively; *External regulation* (whereby the motivation for the behaviour is directly controlled by external factors, e.g. studying for the sole purpose of getting a good grade), *introjected regulation* (whereby the individual has acknowledged but not fully accepted the external controls, e.g. the guilt from missing an aerobics class) , *identified regulation* (whereby the motivation is somewhat internal, and based upon the values which are of personal importance to the individual, e.g. doing homework because one perceives it as valuable) and *integrated regulation* (whereby one fully internalizes the rationale behind a behaviour in conjunction with their personal values, e.g. exercising because it is consistent with the individuals life goals) (Ryan & Deci, 2017; Zanařippa, Castillo, Banos, Delgado, & Alvarez, 2018). Progression along these subtypes depends upon a process which is referred to as *internalization* (Deci, Patrick & Leone, 1994). Ryan & Deci (2017, p.180) define internalization as “the process of taking in values, beliefs, or behavioural regulations from

external sources and transforming them into one's own". In other words, when one acknowledges how the outcome of an extrinsically motivated goal aligns with their personal values, they can experience a higher degree of self-determination. Internalization can be experienced as identified regulation or integrated regulation (Ryan & Deci, 2002). Finding meaning in the task appears to be fundamental to facilitating this process. Two key conclusions can be drawn from the SDT research to date in relation to the applied value the self-determination continuum. Firstly, the fluid nature of motivation highlights the potential for interventions to influence internalization processes as SDT assumes motivation can be subject to change. The challenge is identifying the most effective methods by which to do this. Secondly, the importance of self-determination for the well-being and success of the individual, as outlined, accentuates the applied value of an SDT intervention to facilitate these processes. Then easily accessible interventions to enhance self-determination may be of vital importance, a key aim of the current study.

Within SDT, two sub-theories exist which outline the factors which may facilitate progression along the self-determination continuum: *cognitive evaluation theory* (CET) and *organismic integration theory* (OIT). CET aims to explore the external factors which can enhance, maintain, or diminish the acquisition of intrinsic motivation (Ryan & Deci, 2017). This theory focuses solely on intrinsic motivation. CET postulates that when an individual does not fulfil their needs for autonomy, competence and relatedness, their intrinsic motivation may be undermined. Alternatively, CET states that when these needs are satisfied, the individual is likely to experience intrinsic motivation. The role of feedback has also been put forward by CET and supported by the research as being an effective means of increasing intrinsic motivation when compared to no, neutral or negative feedback (Alesch & Niblack-Rickard, 2018; Burgers, Eden, Engelenberg & Buningh, 2015; Deci, Cascio & Krusell, 1975). However, Ryan and Deci (2000) state that experiencing competence alone will not facilitate intrinsic

motivation. It must be accompanied by autonomy in order for the individual to experience intrinsic motivation. OIT focuses exclusively on extrinsic motivation, and the factors which may facilitate the process of internalization (Ryan & Deci, 2000). Much like CET, OIT also argues that satisfaction of the three basic psychological needs of competence, autonomy and relatedness is directly related to the type of motivation experienced by the individual. However, OIT focuses on factors that facilitate the internalization process, thus increasing the degree of self-determination that one experiences (Ryan & Deci, 2000). OIT states that when a person's goals are in alignment with their values, it is possible for the person to experience internalization. That is to say that, though the motivation is intrinsic, the individual is self-determined as they realise how the goal aligns with their core values (Ryan & Deci, 2000; 2017). Like CET, OIT specifies the important role that autonomy has in self-determination. An individual who exhibits a high level of relatedness and competence may experience introjection, however, in order to experience internalization, these needs must be accompanied by autonomy (Ryan & Deci, 2000). Therefore, OIT and CET both posit that, although competence and relatedness are important factors in acquiring a high level of self-determination, the individual must experience autonomy in order to be self-determined.

As outlined previously, SDT argues that in order to experience the benefits of being self-determined, the individual should be motivated by goals and activities which are intrinsically motivated or consistent with the individual's values and basic psychological needs. However, within today's society, especially when considering the structure of education systems, working environments and societal and cultural pressures, the associated activities which an individual is required to engage in to progress or succeed are not always enjoyable activities, or activities which an individual feels intrinsically motivated to engage in (Ryan & Deci, 2017). For examples, people need jobs for financial security, assignments have to be completed in order to meet a deadline or receive a good grade, and individuals may feel

obligated to achieve milestones by a certain age. Hence, while research indicates that being intrinsically motivated is linked to better levels of well-being and satisfaction, it is unlikely and unrealistic for an individual to feel intrinsically motivated at all times (Ryan & Deci, 2017)). Furthermore, research has consistently shown that intrinsic motivation can be completely diminished when an external reward or consequence is introduced (Fang, Gerhart, & Ledford, 2013; Ryan & Deci, 2017). For example, perhaps the intrinsic motivation experienced while attending classes out of curiosity and a desire to learn could be diminished by course deadlines or grading systems. This provides further justification for the argument that there is a need for research into interventions which can empower people to find meaning in everyday goals and tasks.

### **1.3 SDT and positive psychology**

Although SDT is not traditionally put forward as a positive psychology theory, Sheldon & Ryan (2011) describe SDT and positive psychology as having a natural interface, with both of these fields highlighting conditions which promote and maintain wellbeing, while also identifying conditions which may hinder growth. Within the field of positive psychology, individuals are encouraged to increase their subjective wellbeing and flourish through engaging in simple, evidence based exercises. Such examples of these exercises are writing gratitude lists (Cunha, Pellanda & Reppold, 2019), three good things (Seligman et al., 2005), and positive reminiscence (Bryant, Smart & King, 2005). There is a gap in the research for an accessible, SDT based, writing exercise which can promote the individual's self-determination, such as those which exist within positive psychology. Most positive psychology interventions (PPI's) are self-help, self-administered and involve the individual engaging in some form of self-reflection (Boiler et al., 2013). The process of reflective writing in itself requires "the translation of emotions and experiences into words, and this cognitive process can benefit individuals" (Lie, Karlson, Niemiec, Graue & Oftedal, 2018, p. 312). Perhaps this process of

reflective writing could encourage the individual to reframe their beliefs surrounding the rationale for pursuing a particular goal or engaging in a certain behaviour. This could potentially be facilitated through implementing the principals of CET and OIT in order to guide the reflection process; a concept which has not yet been applied within the research.

Considering the effectiveness of PPI's in promoting wellbeing and flourishing in both clinical and non-clinical populations (Chakhssi, Kraiss, Sommers-Spijkerman & Bohlmeijer, 2018; Hendriks, Schotanus, Dijkstra, Hassankhan, Jong & Bohlmeijer, 2020), it may therefore be valuable to apply SDT principles to a self-reflection exercise in order to enhance self-determination. There is ample theoretical justification to incorporating SDT into a PPI-style reflective writing exercise. This can be observed through the success of PPI's. If PPI style interventions are effective, then it could be useful to adapt SDT into such an intervention. For example, Hoepfner, Schick, Carlon & Hoepfner (2019) conducted a randomized online study of 531 adults, and found that when compared with a control condition, individuals who receive a self-administered PPI exhibited higher levels of happiness following the intervention. To the authors knowledge, there are currently no studies which adapt SDT to a self-administered reflection exercise to assess its potential effectiveness, as will be examined in the present study, the seminal theoretical and applied nature being novel. In line with CET and OIT, an intervention which can successfully promote autonomy, competence or relatedness may successfully improve intrinsic motivation or internalization, thus increasing overall levels of self-determination. Furthermore, as per OIT, it may be valuable to implement a self-reflection exercise which encourages individuals to reflect upon their values, and how these values are in line with their personal goals in order to enhance self-determination.

There is a need to disseminate SDT research through easily accessible, and self-administered exercises which empower the individual to become self-determined. Furthermore, there is also a lack of brief SDT intervention studies. Most studies to date are

carried out over an extended period of time. It would be valuable to apply SDT to a brief intervention in order to assess its immediate effectiveness. Although longitudinal studies are often implemented when administering PPI's, a study by Creswell and colleagues (2005) showed that a simple pre-post reflection intervention can have a significant and immediate effect on the individual. Within their study, a self-affirmation theory (SAT) based intervention was utilized and applied in order to reduce stress responses amongst participants through engaging in a brief reflection exercise. Participants were instructed to reflect upon their values prior to engaging in a stress inducing task. This reflection exercise was based on the principles of SAT, which posits that reflecting on one's values and strengths can minimise the adverse implications of being in a stressful condition. The results from this study showed that the brief reflection exercise had an immediate effect on the participants cortisol levels, with participants who received the intervention showing a lower cortisol response to the stressful situation when compared to the control condition. This study provides a rationale for investigating the efficacy of brief intervention exercises and the immediate effect following engagement with such an intervention. To date, there are no studies which implement the principals of SDT to an intervention in this way, nor are there studies which aim to facilitate or maintain intrinsic motivation and internalization processes. As OIT highlights the importance of aligning one's values with their goals in order to experience internalization, a reflective writing exercise may be an effective means of facilitating this. The importance of the process of reflection in promoting self-determination is articulated by Ryan and Deci (2017, p. 56), who argue that "in order to realize autonomy, a person must reflect upon her wants, needs and desires ... and endorse or identify with them in some way".

#### **1.4 STD based interventions: Previous research**

SDT has acted as the basis for a range of interventions, such as those targeting health behaviours like binge drinking and smoking (Keatley, Clarke & Hagger, 2013; Li et al., 2019; Williams, Niemiec, Ryan & Deci, 2016; Ntaumanis et al., 2020), improving performance in schools and working environments (Carter & Lane, 2011; Deci & Ryan, 2016; Wang, Lie & Ryan, 2016; Sergis, Sampson & Pelliccione, 2018), and improving learning engagement and satisfaction in the classroom (Sergis, Sampson & Pelliccione, 2018). However, there are currently no empirically researched interventions which are universal, self-administered and easily accessible. As previously mentioned, there is a natural interface between SDT and positive psychology. It can therefore be argued that there is a gap in the literature for interventions which implement SDT into a positive psychology style intervention in order to empower people to become self-determined. There is ample research supporting the potential for SDT based interventions to improve a person's level of self-determination through promoting the fulfilment of the basic psychological needs, such as autonomy and competence, and through encouraging the individual to align their work with their values. Although the intervention in the current study has not been previously researched, there are comparable studies which share the same theoretical basis as that of the current study, thus providing an ample evidence base by which to create and implement a SDT based reflective writing intervention.

One such study which investigates the potential for self-determination interventions was carried out by Deci, Eghrari, Patrick & Leone (1994), who conducted a brief intervention study on 192 psychology students, which aimed to investigate methods by which internalization can be facilitated. The researchers encouraged autonomy for participants in the experimental condition through providing a meaningful rationale for taking part in an uninteresting task (articulating that the task at hand may improve their concentration), while

the control group were informed that the task may not be particularly interesting, thus not providing a meaningful rationale for the participants. Furthermore, the language used in the SDT supportive condition used need supportive language which communicated choice, while the control condition were presented with instructions which did not communicate choice, such as “you have to” and “you are required to”. The results from this study found that individuals in the condition which promoted autonomy and a meaningful rationale were more likely to experience internalisation, while participants in the condition which did not support autonomy and meaning were more likely to experience introjection, or external regulation. This suggests that an intervention which aims to encourage individuals to think autonomously and reflect upon the meaning and value of a task may be an effective means of improving self-determination.

However, this study has not been followed up on and there is a lack of studies which have built upon and expanded these findings. One potential limitation of the study is that the participants baseline level of self-determination was not measured. Rather, participants simply acknowledged whether or not the practice run of the task was uninteresting (with the consensus being that the task was not interesting), with the dependent measures only being assessed following the task. Research could improve upon this by measuring self-determination at base line and follow up in order to have a clear and accurate comparison by which to assess the change in self-determination. Furthermore, the participants in this study were all psychology students. Research could improve upon this by administering the intervention to the general adult population. The findings from this research provides a theoretical basis for the intervention in the present study, which aims to increase self-determination through encouraging participants to align their values with their goals and to think autonomously. Thus, examining the intervention administered by Deci and colleagues, building upon its limitations, applying the theoretical basic of this intervention to a reflective writing exercise.



Another successful application of SDT can be seen in research which aims to reduce problem tobacco use. Williams and colleagues (2006) implemented an SDT based clinical trial to promote tobacco cessation amongst 1006 smoker. Participants were randomly assigned to a community care control condition, or an SDT intensive intervention condition. The intervention condition received both autonomy and competence support counselling. This involved being encouraged to reflect on their values, and most importantly, if smoking aligned with these values. Furthermore, their competence was supported through creating quit plans. Results from this study revealed that receiving the autonomy and competence support intervention predicted greater tobacco cessation than the control condition. More recently, Lim and Ha (2019) reported that a 12 week SDT based counselling and texting service was effective in increasing cessation of smoking when compared with a control condition who did not receive the intervention. Participants in the SDT intervention condition were encouraged to focus on the meaning behind quitting smoking and the relationship between their values and smoking cessation. Strategies were also put in place to encourage competence such as creating coping strategies and receiving effective, supportive feedback.

SDT interventions have also been found to be effective in increasing motivation to engage in physical activity. Chatzisarantis & Hagger (2009) conducted a five week SDT based intervention which aimed to improve physical activity participation amongst 215 school pupils. Students who received autonomy support through being provided with a meaningful rationale and choice reported a stronger motivation to participate in leisure time physical activities than students in the control condition following the 5 week study. Furthermore, although there are no empirically supported SDT based, self-administered interventions, the theory has been applied to a worksheet for individuals with OCD. This worksheet focuses on enhancing the individual's autonomy, competence, and relatedness through the use of writing prompts which encourage the person to focus on these areas (Ackerman, 2019). However, the

utility of these worksheets have not been empirically validated. Although the research highlights the potential for SDT to be successfully applied, there is a lack of research which looks at the potential for SDT to be practiced in a more universal way, such as empowering people to promote their own self-determination using accessible and self-administered exercises. Interventions to date typically require the intervention to be administered by another person such, as a teacher, coach, counsellor, or manager.

### **1.5 SDT and goal setting**

The literature describes long term goals as being pursuits, which guide an individual's direction in life over an extended period of time (Hefferon & Boniwell, 2011; Shia, 1998). These goals are viewed as being imperative to the individual's sense of purpose, life meaning, and self-esteem, as well as providing structure to the person's life (Hefferon & Boniwell, 2011). Furthermore, within positive psychology, the literature indicates that an individual's innate ability to set a goal, reflect upon, and pursue a goal, is a fundamental component of well-being. Goal orientation refers to reason which underlies an individual's decision to pursue a goal, with two main categories which goal orientation can fall under: mastery-oriented and performance-oriented (Boyd, 2017; D'Lima, Winsler & Kitsantas, 2014). Research has illustrated that mastery orientation is associated with intrinsic motivation as the mastery goals are pursued due to the individuals desire to self-improve, increase in self-competence and experience personal fulfilment; the individuals motivation comes from within rather than being influenced by external factors (Boyd, 2017; Locke & Latham, 2019). Hefferon & Boniwell, 2011 found that that people who pursue intrinsically motivated or mastery goals show higher levels of subjective wellbeing than those who do not. The research has highlighted the importance of self-determination in goal setting. For instance, studies indicate that extrinsically motivated goals are associated with lower subjective wellbeing, self-efficacy, and success (Hefferon & Boniwell, 2011; Hui & Tsang, 2012). However, although the research highlights why and how

self-determination is important in relation to goal setting, there are currently no self-administered intervention exercises which aim to increase a person's self-determination towards their goals.

## **1.6 Gender and age**

One of the key assumptions of SDT is the universality of the psychological constructs and processes across developmental stages and gender (Guérin, Bales, Sweet & Fortier, 2012). SDT posits that the fundamental need for personal growth and the satisfaction of the three basic psychological needs of competence, autonomy and relatedness applies to individuals of all ages, genders, cultures, and socio-economic backgrounds (Guérin, Bales, Sweet & Fortier, 2012; Ryan & Deci, 2000; Ryan & Deci, 2002). However, some studies indicate that the extent to which one experiences self-determination may vary in relation to factors such as age or gender. One such study that has investigated gender differences in experiencing self-determination was conducted by Ayub (2010), who investigated the relationship between level of intrinsic (high self-determination) and extrinsic (low self-determination) motivation and gender for 200 university students (100 male, 100 female), and found significant gender differences. Results from this study indicated that females exhibited higher levels of intrinsic motivation and, contrariwise, male students showed higher levels of extrinsic motivation. In relation to goal setting specifically, numerous studies posit that females are more likely to pursue intrinsically motivated, mastery goals than males; ranging from classroom to sport motivation (Boyd, 2017; D'Lima, 2014; Heppler & Witte, 2016).

In contrast to these findings, Kunanithaworn and colleagues (2018) conducted a path analysis which investigated the intrinsic and extrinsic motivation across 128 male and female medical students. The results from this study revealed that extrinsic motivation was positively associated with being female and amotivation was associated with being male. Furthermore, a

study conducted by Kusurkar, Ten, Vo, Westers & Croiset's, (2013) provided further contrasting evidence, revealing that females showed significantly higher levels of external and introjected motivation than males in a study of 383 students. In response to the inconsistency of the research, Guerin and colleagues (2012) examined the literature pertaining to the relationship between gender and self-determination. A meta-analysis was conducted on 27 research papers and found that, overall, there was no significant difference between males and females for self-determination.

Research has also investigated the way in which self-determination may change over time or between different age groups. One such study which has examined the relationship between age and self-determination was conducted by Sheldon, Houser-Marko and Kasser (2006), who found that people were more likely to pursue self-determined and autonomous goals as their age increased. However, in contrast to these findings, Mackenzie, Karaoylas and Starzyk (2017) investigated the lifespan differences in an SDT model of eudaimonia across three age groups (younger, middle aged and older adults). This model describes eudaimonia as being a process whereby goal autonomy is intrinsically motivated rather than extrinsically motivated. They found that older adults reported the lowest levels of eudemonic behaviour, purpose, and growth. It was further reported that older adults may experience difficulty in finding opportunities for goal setting and continued growth thus resulting in lower levels of intrinsic motivation (Mackenzie et al., 2017; Ryff & Singer, 2008). There is evidence both in support of and against the argument that self-determination increases as a person ages. As Mackenzie and colleagues' (2017) research is more recent thus providing evidence against Sheldon and colleagues (2006), it could be argued that older adults may experience lower levels of self-determination.

It should be noted that the world is currently in the midst of the Covid-19 pandemic, with older adults in particular being advised to "cocoon" or self-isolate ("People at higher risk

of Coronavirus, 2020). This may have negative impact on competence, relatedness, and autonomy for people of all ages . However as older adults are particularly susceptible to the virus, it is worth considering that this may have a negative effect in their self-determination in particular. Though there is no research which can support this argument, it should be acknowledged that the coronavirus might act as a confounding variable.

### **1.7 Rationale**

In summary, the reviewed literature has outlined that SDT based interventions can be an effective means of increasing self-determined motivation. SDT posits that autonomy, competence, and relatedness are the three basic psychological needs which, when fulfilled, result in an individual experiencing self-determination. SDT also argues that internalization occurs when an individual aligns their goals with their values, thus resulting in the individual experiencing a higher degree of self-determination. The research on self-determination interventions focuses predominantly on autonomy, competence, and the alignment of values with goals therefore this study will incorporate these components into the reflective writing exercise.

Ryan and Deci (2017) have pointed out the prominence of extrinsically motivating factors within today's society. The literature indicates that these extrinsically motivating forces can diminish intrinsic motivation and decrease self-determination overall, further highlighting the need for an intervention which can empower individuals to work towards becoming self-determined. All of the SDT based interventions to date are administered by another individual, such as a coach or teacher, however, the SDT research has not been disseminated to the general population in a way that would allow them to understand and apply it to their own lives. Although it is indeed important to apply SDT to areas such as health and learning, it is worth considering the argument that these studies focus on changing people's motivation and

behaviour towards goals which the study has presented them with, such as becoming a better learner or changing their health behaviour. The purpose of the present study has been to address the lack of a universal application of SDT; to apply SDT in such a way that it is easily accessible, universal, and self-administered. The current study has merged SDT with positive psychology through incorporating SDT into a positive psychology style exercise. Much like how research into gratitude and mindfulness has been disseminated in such a way that it empowers individuals to practice it in their own life, this study aims to apply and disseminate SDT in a similar way. This study therefore aims to offer a unique contribution to the field of psychology by merging two distinct theoretical perspectives in order to examine a novel application of SDT. Lastly, although SDT is a universal theory, there are inconsistencies in the research in relation to gender and age differences in the acquisition of self-determination, however the literature generally posits that females are more likely to be intrinsically motivated than males, and older adults may not be as self-determined as younger adults. Therefore, perhaps demographic differences exist in relation to who the intervention is most effective for. The SDT intervention will implement autonomy, competence, and goal-value alignment into a reflective writing exercise, based on the existing research.

## 1.8 Hypotheses

A review of SDT, PPI and the gaps in the research have informed the hypotheses of this study. This research aims to investigate the following hypotheses:

1. A brief self-determination theory based reflective writing exercise facilitates progress along the self-determination continuum amongst participants, when compared to a control group.

2. A brief self-determination theory based reflective writing exercise increases perceived self-competence amongst participants when compared to a control group.

3. The self-determination theory based exercise is more effective for females than for males.

4. The self-determination theory based exercise is more effective for younger adults than for the older age groups.

## 2. Method

### 2.1 Participants

The sample population for this study consisted of 155 males and females over the age of 18. Initially, participants were recruited through means of convenience sampling. Participants could volunteer to take part in the study through following a URL link which was shared through the social networking platforms of Instagram, Facebook, Twitter, Whatsapp, Gmail and LinkedIn. Access to the study was further disseminated through shares across the various different social networks which increased the study response. Participants were randomly allocated to either an experiment ( $n = 84$ ) or control ( $n = 71$ ) condition. The experiment condition was made up of 62 females and 22 males, while the control condition was made up of 56 females and 15 males. All participants had a minimum education level of leaving certificate, with the majority of participants holding an undergraduate or a masters degree.

#### *Inclusion criteria*

Males and females over the age of 18 who consented to take part in the study.

English speaking

#### *Exclusion criteria*

Males and females under the age of 18.

Individuals who did not consent to take part in the study.

Individuals who were not fluent in English



## 2.2 Design

The current study employed a between-within groups, randomised control experiment design. The between groups factor is the traditional RCT design, which consists of two levels: the experimental and control condition. The between groups dependent variables (DV's) are the results of the Situational Motivation Scale (SIMS) and the Perceived Competence Scale (PCS), while the independent variable (IV) is the random application of either the experiment or control intervention. The within groups factor is the pre and post testing which consists of two levels: time one and time two. The within groups IV is the time pre and post, and the two DV's are the results from the SIMS and the PCS.

## 2.3 Materials

A questionnaire was created on google forms which presented both the experiment and control condition participants with an information and consent page which outlined the nature of the study [See appendix A] Participants provided consent through ticking a box which confirmed that they were over the age of 18 and consented to take part in the research. Following this participants were asked to provide their demographic information which included sex, age, employment status and education level. Participants were presented with text which asked them to think about a goal that they are working towards [Appendix B], and to answer the following measures in relation to said goal.

### *Situational Motivation Scale*

Situational motivation refers to the type of motivation that an individual experiences while they are taking part in an activity (Escher et al., 2017). In the case of this study, the SIMS was used to measure the type of motivation that the participant experienced while reflecting upon a long term goal of their choice both prior to and following engagement with an intervention. The SIMS [See appendix C] consists of four subscales, each of which measure

the participants level of self-determination in relation to their long-term goal. The four subscales included in the SIMS are intrinsic motivation, identified regulation, external regulation and amotivation. The original SIMS is composed of 16 questions which pose questions in relation to the participants rationale for engaging in an activity. For the current study, the wording of the questions were amended in order to assess the participants rationale for pursuing their chosen long term goal. The score for each of the four subscales is determined through calculating the mean of the responses to their associated questions. In order to calculate a total self-determination score (TSDS) towards a long-term goal, the formula validated by Blanchard, Mask, Vallerand, de la Sablonniere and Provencher (2007) was applied [See appendix C]

Reliability for the TSDS was assessed through examining each of the four individual subscales as per Hinton, Brownlow, McMurry and and Cozen's (2004) Chronbach alpha ranges for excellent ( $>0.9$ ), high ( $0.70 - 0.90$ ), moderate ( $0.50-0.70$ ) and low ( $\leq 0.50$ ) levels of internal consistency reliability. Each of the subscales showed moderate to high levels of internal consistency reliability; intrinsic motivation ( $\alpha = .71$ ), identified regulation ( $\alpha = .52$ ), external regulation ( $\alpha = .8$ ) and amotivation ( $\alpha = .7$ ). The average Chronbach alpha coefficients for TSDS was deduced, as per recommendation by Blanchard and colleagues (2007), through calculating the average Chronbach alpha coefficient for each of the four subscales. TSDS showed high internal consistency reliability ( $\alpha = .7$ ). A validity assessment for TSDS was conducted through means of a confirmatory factor analysis. The factorability of the four individual subscales was examined, each of which exhibited a KMO value which was greater than the typically recommended .6 (Pallant, 2016), thus meeting the assumptions of adequacy. Each of the 4 subscales consisted of one factor each. There is a clear one factor solution for each of the subscales, therefore supporting a strong validity for the construct of TSDS.

Extensive research was conducted in order to choose a suitable measure for level of self-determination. Initially, the General Causality Scale (GCS) was considered for this study. However, the GCS measures causality orientation (competence, autonomy, relatedness), describing these orientations as “relatively enduring aspect of personality” (Deci & Ryan, 1985, p.109). This definition does not align with the current research which understands self-determination as a fluid concept which can be subject to change based on facilitating or diminishing factors. The GCS does not anticipate such changes. Therefore, the SIMS was chosen for the present study, as it has been specifically created for experimental purposes.

#### *Perceived Competence Scale*

The PCS [See appendix D] will be used to assess the participants level of perceived self-competence prior to and following engagement with an intervention. Previous research has demonstrated how the wording of the PCS can be amended depending on the nature of the study (Haslem, Wilkinson, Prusak, Christensen, & Pennington, 2016; Williams & Deci, 1996; Williams, Freedman & Deci, 1998). The PCS is a short questionnaire consisting of four statements. The participant is asked to rate the extent to which they relate to the statement on a Likert-type scale of one to seven; one indicating *not true at all* and seven indicating *very true*. The participants perceived self-competence level is then determined by calculating the sum of their four statement responses. PCS shows excellent internal consistency reliability ( $\alpha = .9$ ). The PCS also shows a clear one factor solution thus supporting the scale validity.

#### *Intervention exercise*

This research involved administering a novel self-determination theory based reflective writing exercise [See appendix D] in order to assess its effectiveness in facilitating internalization processes and promoting intrinsic motivation. The intervention consisted of three reflective writing prompts which are based on SDT and the associated research [See

appendix E]. The first writing prompt is based on internalized regulation research and encouraged the participant to reflect upon how their goal lines up with their core values. The remaining writing prompts relate to two of the basic psychological needs as postulated by Ryan & Deci (2000); autonomy and competence. These prompts encouraged the individual to focus on their own personal reasons for choosing to pursue this goal (autonomy) and to reflect upon a time where they successfully applied the skills or abilities required to achieve their goal (competence). The aim of this intervention is to encourage the participants to reframe their beliefs in relation to why they are pursuing their chosen long-term goal through increasing their level of self-determination. For individuals who already experience internalised regulation or intrinsic motivation, simply aims to maintain, or further improve these levels of self-determination.

#### *Control intervention exercise*

The control intervention exercise asks participants to reflect upon what motivates them towards achieving their long term goal. This exercise presents participants with two writing prompts which do not aim to change how the participant perceives their goal, their perceived self-competence or self-determination. It is anticipated that this exercise will not yield any changes in the participants SIMS and PCS measures [See appendix F]

## **2.4 Procedure**

In order to obtain the participant sample for this research, a link to the research questionnaire was shared across the social networking platforms of Facebook, Instagram, Twitter, Whatsapp, Gmail, Reddit and LinkedIn. As this research involves both experimental and control conditions, the website [splitter.appdrag.org](http://splitter.appdrag.org) was used to create a URL which randomly allocated participants to one of the two conditions. Participants clicked on the link which brought them to the study. Information regarding the nature of the study and what the

study entailed was presented to the participant, and participants ticked the box to confirm that they consented to take part in the study and were over the age of 18. Participants were asked to provide responses for five demographic questions. After the demographic information was provided, text appeared on the screen which instructed the participant to take a pen and paper and write down a goal that they are hoping to achieve within the next one to three years. Participants were told that the questions which followed would relate to this goal. The participants were then required to complete then SIMS and PCS. The instructions for both surveys were located at the top of the screen. When the survey responses were submitted, participants were brought to the reflective writing exercise segment of the study. The experiment condition participants received the SDT based reflective writing exercise, and the control condition participants received a control reflective writing exercise. Upon completion of the reflective writing exercises, participants were required to complete the SIMS and PCS once again. Upon completion of the questionnaire, participants were thanked and fully debriefed on the nature of the study [See appendix G]. Should the participants be negatively affected by any of the questions or exercises in the study, a list of local support services were also provided. The questionnaire was closed when the desired number of participant responses had been collected.

## **2.5 Ethical considerations**

Prior to initiating the study, ethical approval was requested and approved through the Dublin Business School ethics committee. The research was conducted in alignment with the PSI code of professional ethics (2019) and the Dublin Business School ethical guidelines for research with human participants. Prior to participating in the study, participants were presented with an information page which outlined the nature of the study and what participation in the study would entail. Participants were also informed that their participation was completely voluntary and that their responses would be treated with total confidentiality.

Data was not collected until the participant had submit their responses. This ensured that the participant could quit at any time. However, as participation was anonymous, participants were unable to withdraw their data once the form had been submitted. This was outlined to the participant in the information page. Participants provided consent in light of this information through ticking a box confirming that they consented to take part in the study and were over the age of 18 [See appendix A].

In order to further protect the participants anonymity, no identifying details were collected. The data obtained from this study was stored on a password protected computer and an encrypted USB. Data will be destroyed in one year. Ethical considerations were also taken into account in relation to the allocation of participants to the experiment or control condition. In order to ensure ethical and random allocation, the website “splitter.appdrag” was used to conduct the A/B testing. In order to ensure that participants in the control condition are not disadvantaged following a study, it is typical for intervention research to offer the control condition the opportunity to partake in the experiment intervention on completion of the study. Though this is an important ethical consideration, participants in the control condition in this study were not offered the opportunity to receive the experiment intervention following the study due to the fact that the current research is novel, with no prior studies indicating its effectiveness.

### 3. Results

#### 3.1 Demographics

155 participants took part in this study, the majority of whom were female [see table 1]. Participants were divided between an intervention condition (n = 84) and a control condition (n = 74). Participants within the age ranges of 18-24 and 25-30 represented the highest proportion of participants. The proportion of participants within each age range decreased as age range increased [see figure 1]. In relation to employment status, a large proportion of participants were either full-time employed (n=68) or students (n=44), followed by participants who were part-time employed (n=18) or unemployed (n=17) [see figure 2]. Each participant had a minimum education status of completing second level education, with no participants reporting to have *less than leaving certificate*. [see figure 3].

Initial analysis revealed that the data for the scales used within this study were negatively skewed, with each scale exhibiting skewness and kurtosis scores which were greater than twice their standard error. As these measures were part of hypotheses which required a two way mixed ANOVA, which does not have a non-parametric alternative, the self-determination scales and intrinsic motivation subscales were transformed using the reverse and square root formula in SPSS. Following this mathematical modification, the data exhibited satisfactory skewness and kurtosis scores [see table 2]. As per Cohens power primer (1992), this study consisted of a sufficient number of participants to achieve a significance criterion of .05 with a medium effect size at power .8 for hypotheses one and two. Hypotheses three and four did not meet the sufficient participant sample size for a medium population effect size at this level. Hypothesis three consisted of a sufficient number of participants to achieve a large population effect size at a significance of .05 at power .8. However, hypothesis four consisted of one group which did not meet a sufficient sample size to achieve any statistical significance (Age: 60+, n= 1).

### 3.2 Inferential statistics

#### Hypothesis 1:

Hypothesis one posits that an SDT based reflective writing exercise increases an individual's levels of self-determination when compared to a control condition, who experience no change in self-determination. Preliminary analysis of the data revealed that the total self-determination score (TSDS) violated the assumption of homogeneity. As there is currently no non-parametric alternative for a two way mixed ANOVA, the data was transformed in order for it to be normally distributed. As the data was negatively skewed, the reflect and square root transformation was conducted through utilizing the following formula in SPSS:  $\text{SQRT}(K - \text{old variable})$  whereby K is the largest possible self-determination variable + 1. Note, the formula which was employed reversed the polarity of the scoring such that a low score now means higher self-determination, and a high score now means lower self-determination. A mixed between-within groups analysis of variance was employed in order to investigate if the self-determination theory based reflective writing exercise was effective in improving participants level of self-determination, when compared to a control condition. Participants' level of self-determination was collected at two time periods (pre-intervention and post-intervention). There was a significant interaction effect between intervention type and time of assessment, Wilks' Lambda = .97,  $F(1, 153) = 5.22$ ,  $p = .02$ , with an effect size of .03 [see table 3]. Using the commonly employed table proposed by Cohen (1988), the results from this analysis suggests a small effect size [see figure 4]. In relation to main effects, there was a significant difference between pre-intervention and post-intervention self-determination, Wilks' Lambda = .93,  $F(1, 153) = 11.86$ ,  $p < .05$ . The main effect of condition was not significant,  $F(1, 153) = .004$ ,  $p = .95$ , partial eta squared = .00. The null hypothesis is rejected.



## Hypothesis 2:

Hypothesis two posits that an SDT based reflective writing exercise increases an individual's levels of perceived self-competence when compared to a control condition, who experience no change in perceived self-competence. The Skewness and kurtosis exhibited by the PCS indicated that the assumption of normality of distribution had been violated, thus it was not appropriate to carry out a two way mixed ANOVA on these data. The data was transformed according to recommendations by Tabachnick and Fidell (2013, p. 87) , however, the data continued to violate the assumption of normality. Two non-parametric alternatives were applied in order to investigate if the self-determination theory based reflective writing exercise was effective in improving participants perceived self-competence when compared to a control condition.

The data file was split by condition in order to apply the Wilcoxon signed. This enabled SPSS to produce an analysis for both conditions separately. A Wilcoxon signed rank test revealed a statistically significant increase in perceived self-competence for the experiment condition,  $z = -2.9$ ,  $p < .005$ , with a medium effect size ( $r = .32$ ), and a statistically significant increase in in perceived self-competence for the control condition,  $z = -3.0$ ,  $p < .005$ , with a medium effect size ( $r = .35$ ). The median score on the PCS for the experiment condition increased from pre-intervention ( $Md = 6.0$ ) to post intervention ( $Md = 6.25$ ), while the median score on the PCS for the control condition does not change from pre-control intervention to post-control intervention. The data was unsplit, and a Mann Whitney U test was applied in order to investigate the difference between change scores of perceived self-competence for the intervention condition and the control condition. The change scores for perceived self-competence were calculated by subtracting the time one PCS scores from the time two perceived competence scores for each participant. The analysis revealed no significant difference in the change scores of perceived self-competence for the experiment condition ( $Md$

= 0,  $n = 84$ ) and the control condition ( $Md = 0$ ,  $n = 71$ ). This analysis failed to reject the null hypothesis.

#### Hypothesis 3:

Hypothesis three posits females in the experiment condition experience a significantly greater increase in self-determination than males following the self-determination theory based reflective writing exercise. The data was split by condition in order to assess the gender differences for the experiment group only (Males  $n = 22$ , female = 62). An independent-samples t-test was conducted in order to compare the TSDS for experiment condition males ( $M = -.25$ ,  $SD = .65$ ) and experiment condition females ( $M = -.21$ ,  $SD = .3$ );  $t(82) = .39$ ,  $p = .7$ , two-tailed. This analysis fails to reject the null hypothesis.

#### Hypothesis 4:

A one way between groups analysis of variance was applied in order to examine hypothesis four. It was hypothesised that participants in the self-determination intervention condition show differences in relation to their change of TSDS depending on the age range that they fall into with older participants exhibiting lower self-determination change scores than the younger groups [see figure 5]. Levene's test for homogeneity of variance confirmed that the assumption of homogeneity was not violated. Analysis revealed that there was no significant difference between age ranges and total self-determination change score;  $F(3, 80) = 1.05$ ,  $p = .38$ .

## 4.1 Tables

*Table 1*

*Table showing gender frequencies of all participants (N=155)*

	<b>Frequency</b>	<b>Percent</b>	<b>Cumulative percent</b>
Females	118	76.1	76.1
Males	37	23.9	100

*Figure 1*

*Bar chart showing age range of participants broken down by percentage (N=155)*

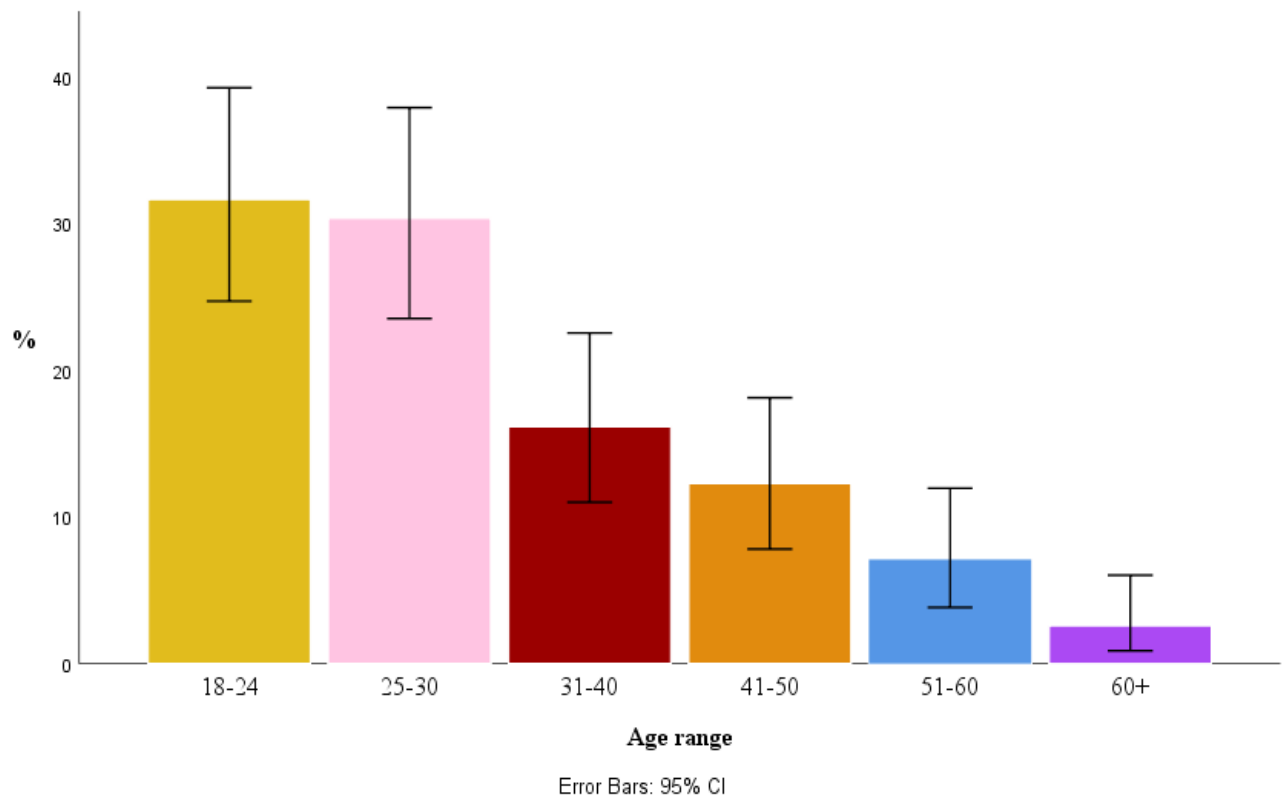


Figure 2

Bar graph showing employment status of participants broken down by percentage (N= 155)

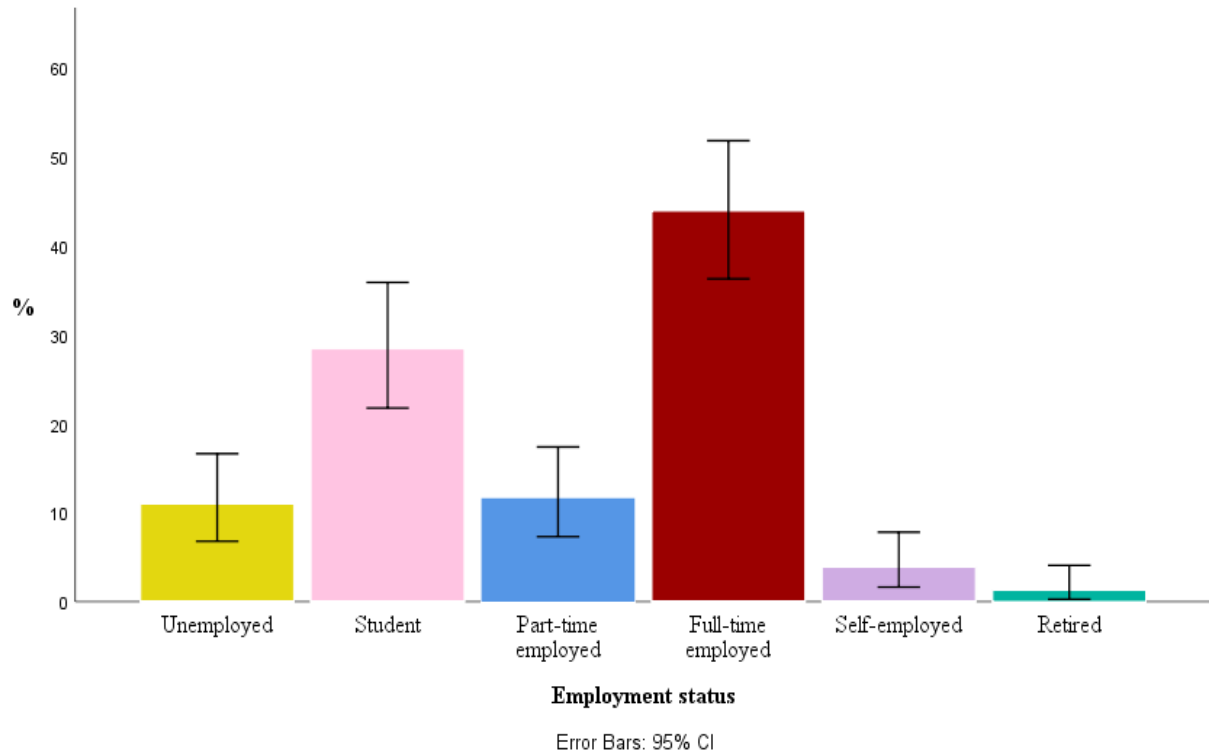


Figure 3

Bar chart showing education level of participants (n=155)

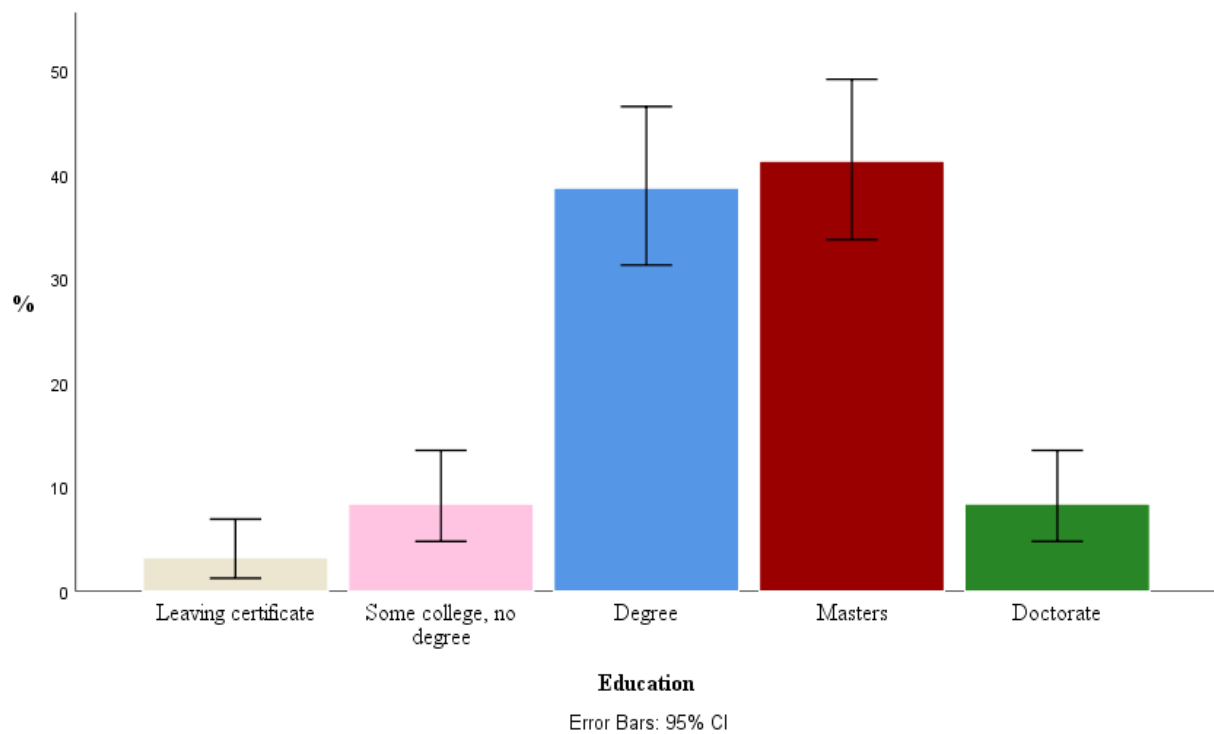


Table 2

Descriptive statistics of dependent variables (N = 155)

<b>Variable</b>	<b>Mean</b>	<b>Median</b>	<b>SD</b>	<b>Skewness</b>	<b>Kurtosis</b>	<b>Possible range</b>
Total self-determination time one	2.94	3.00	.75	-1.16	-.36	*1 – 6.08
Total perceived self-competence time one	5.83	6	1.0	-1.03	1.3	1 – 7
Total self-determination time two	2.8	2.79	.78	.02	-.52	*1 – 6.08
Total perceived self-competence time two	6.02	6.0	.93	-1.07	1.03	1 – 7
Perceived competence change score	.19	0	.58	2.9	15.28	0 – 6
Total self-determination change score	-.14	-.14	.48	.5	6.8	*0 – 5.08

\*Note: Transformation process reversed the polarity of the scoring, such that a low score is indicative of a high result from the associated scale, and a high score is indicative of a low result from the associated scale.

Table 3

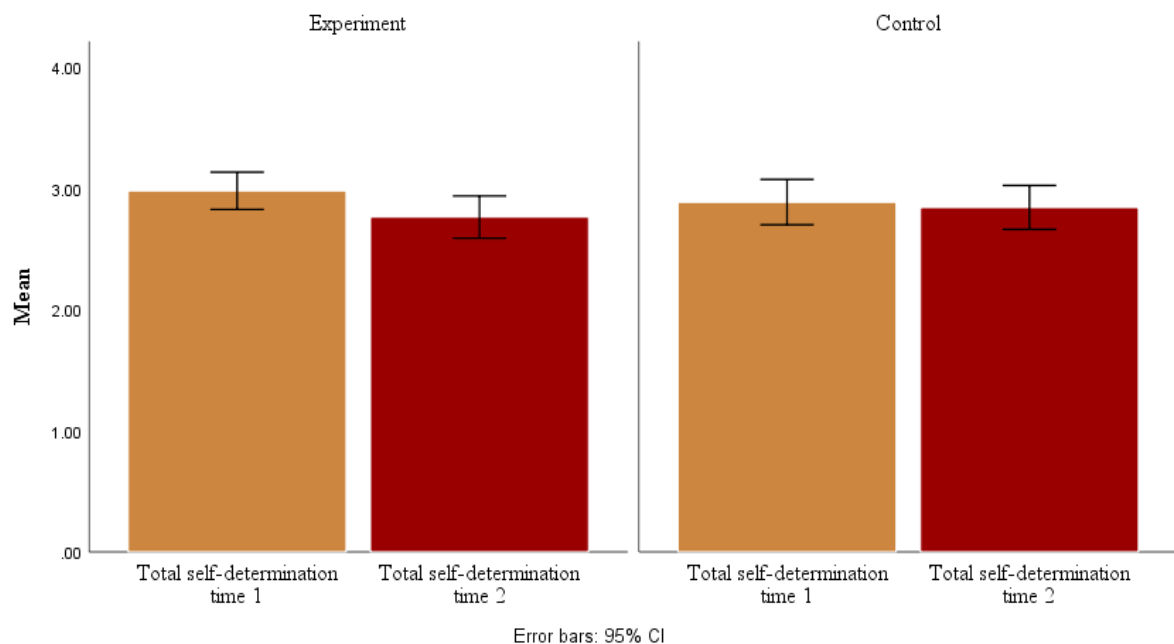
Two way mixed ANOVA results showing total self-determination score for the experiment and control condition across two time periods.

Time period	Experiment			Control		
	n	M	SD	n	M	SD
Pre-intervention	84	2.98	.71	71	2.88	.79
Post-intervention	84	2.76	.80	71	2.84	.77

\*Note: Due to mathematical transformation of scores, a low score is indicative of high self-determination, and a high score is indicative of low self-determination.

Figure 4

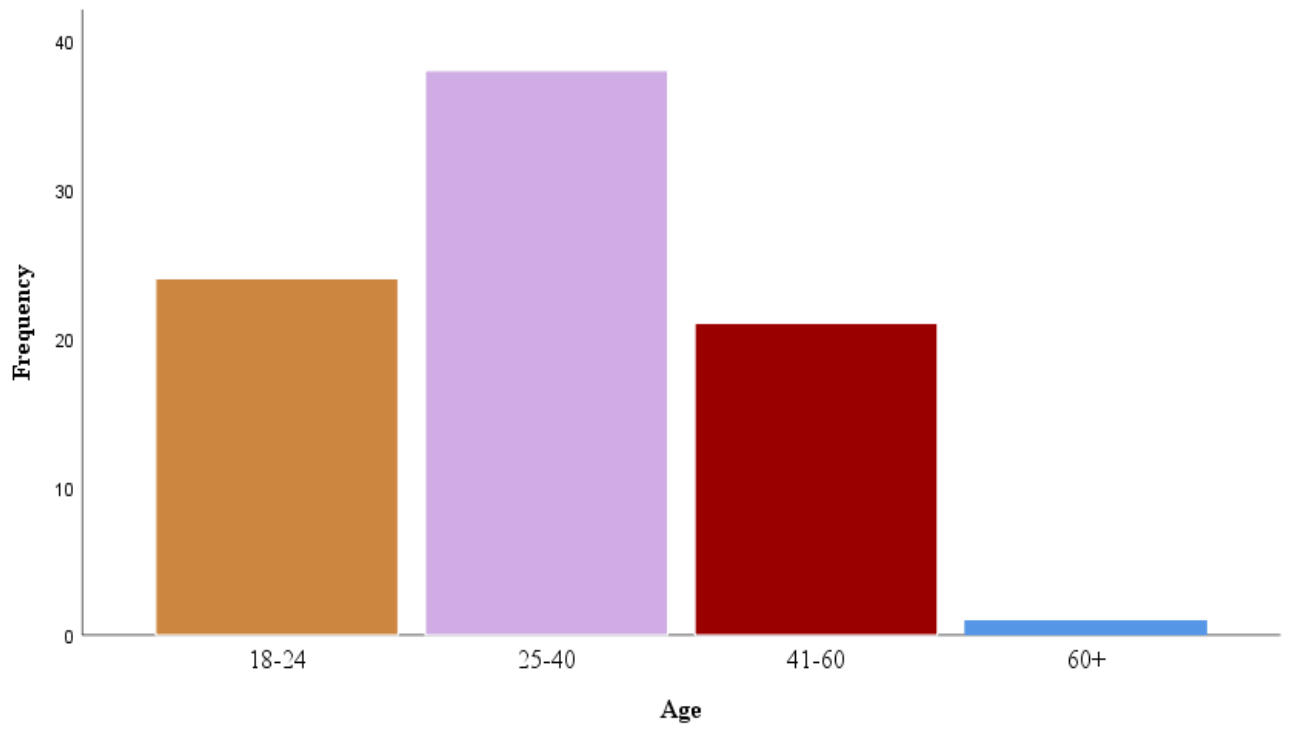
Bar chart showing changes in total self-determination score from pre to post intervention for both conditions.



\*Note: Due to mathematical transformation of scores, a decrease in mean TSDS is indicative of an increase in self-determination

Figure 5

*Frequencies of age ranges within the intervention condition*



## 4. Discussion

### 4.1 Hypothesis 1

It was hypothesised that the SDT based reflective writing exercise would increase participants self-determination towards their chosen long-term goal when compared to the control condition. There was a significant interaction effect between condition and time, which revealed that the participants change in TSDS from pre intervention to post intervention was mediated by the condition in which they were allocated to. This analysis revealed that the participants who received the SDT reflective writing exercise experienced an increased level of self-determination towards their chosen goal post intervention, with this increase being significantly greater than the change in TSDS within the control condition. Thus, this study rejects the null hypothesis. The effect size of the significance was small, therefore future studies should investigate if implementing the exercise over an extended period of time would lead to an increased effect size.

These findings are consistent with the previous research by Deci and colleagues (1994), whereby the researchers implemented a brief intervention which supported autonomy and presented a meaningful rationale to participants. Similar to the present study, Deci and colleagues found that participants who received the brief intervention were more likely to experience internalization, thus higher self-determination. The present study provides further support of these findings, while also implementing additional factors in order to build upon the limitations of Deci and colleagues research and applying their findings to the current study; especially considering the lack of follow up studies. For instance, Deci and colleagues (1994) did not measure baseline self-determination level, however the current study measured both baseline and post intervention TSDS for both conditions in order to accurately measure changes in self-determination. Similar to Deci and colleagues, the current study also provides support



for the effectiveness of a brief intervention. Deci and colleagues applied their intervention as a short experiment, unlike typical SDT and PPI interventions which tend to occur over a longer period of time. Participants in Deci and colleagues (1994) research showed immediate regulation differences based on whether or not their autonomy and value orientation was supported by the experimenter. Similarly, participants in the experiment condition for the current study showed significant TSDS changes from pre intervention to post intervention, while the control condition did not. The argument that a brief experiment may have the potential to have an immediate effect was also based on the research by Creswell and colleagues (2005) who similarly showed the potential for a theory based intervention to have an immediate effect. Though Creswell and colleagues' research did not include SDT, they provided sufficient justification for the administration a brief intervention experiment. As the majority of PPI research is longitudinal, the current study provides a unique contribution in that the changes in TSDS can be seen from a single engagement with the exercise. These findings are important as they lay the ground work for future studies to implement the SDT based reflective writing exercise to a longitudinal study, whilst also demonstrating that it may even have immediate effects. However, future research is needed.

While Deci and colleagues research (1994) provided support of the use of value and autonomy based writing prompts, Williams and colleagues (2006) revealed that providing competence support, as well as autonomy, is effective in enhancing self-determination. The current study applied the basis of this intervention to the reflective writing intervention. Although Williams and colleagues (2006) had aimed to target a specific health behaviour and the current study allowed participants to choose any goal, both studies posit the same argument: supporting competence and autonomy enhances self-determination. However, Williams and colleagues did not include the OIT construct of internalization to their intervention. Deci and colleagues (1994) outlined the importance of internalization in enhancing self-determination.

The current study implemented the construct of internalization through encouraging the participants to focus on the ways in which their goal aligns with their values, and the results from the current study indicate that the intervention was successful.

As SDT based interventions have been applied to such a broad range of areas, such as schools, universities, fitness, and health, the current study was provided with the empirical justification to allow participants to choose their own goal. In other words, as the principles of SDT are considered to be universal, and the previous research has applied SDT to a wide range of environments, it could be argued that the results of receiving an SDT based intervention should be effective for all participants who receive it. However, it is worth considering that some behaviours may be more difficult to change. In the case of Williams and colleagues' (2006) participants received a 6-month intervention in order to target the participants self-determination. This was also evident in Lim and Ha (2019) study which presented smokers with a 12 week SDT based intervention, and Chatzourantidis and Hagger (2009) who conducted a 5 week intervention to improve the physical activity of school pupils. Each of these interventions were successful in improving self-determination over an extended period of time. Although the current study presented a significant improvement in self-determination in the experiment condition, it is worth considering that this difference exhibited a small effect size, while Williams and colleagues, Lim and Ha, and Chatzourantidis and Hagger not only reported that self-determination had increased following their interventions, but participants who received the intervention followed through with changed behaviour. Future research could address this aspect of the current study in order to assess if frequent engagement with the SDT based reflective writing exercise results in a larger effect size.

## 4.2 Hypothesis 2

It was hypothesised that the SDT based reflective writing exercise would increase participants perceived self-competence towards their chosen long-term goal when compared to the control condition. A Wilcoxon signed rank test revealed that both experiment and control conditions experienced a significant increase in perceived self-competence, however a Mann Whitney U Test revealed that there was no significant difference in PCS change scores between the two conditions. The findings from this analysis were unexpected, with both the experiment and the control interventions appearing to increase participants perceived self-competence. This analysis failed to reject the null hypothesis, as a significant change in perceived self-competence was not anticipated for the control condition.

The control intervention asked participants to a) reflect on a time in their life when they felt motivated and write about the factors that motivated them, and b) to write about something that is motivating them towards their goal. As outlined in hypothesis one, this intervention was not successful in improving overall self-determination, as anticipated. Yet, the intervention was successful in improving perceived self-competence – a key component of self-determination theory. In line with Ryan and Deci (2000), the findings from hypothesis two revealed that, although the control condition did not experience a change in self-determination (hypothesis one), the participants experienced an increase in perceived self-competence. Ryan and Deci (2000) state that autonomy must accompany competence in order for the individual to experience intrinsic motivation or high levels of self-determination, and the findings from this analysis are consistent with this. It is unclear why the control intervention resulted in an increase in perceived self-competence, however this finding posits that it is not sufficient to improve perceived self-competence, further highlighting the importance of the constructs of autonomy, and aligning values with the goal. It could also potentially be argued that the experiment intervention successfully enhanced autonomy, through process of deduction. That

is to say that, as the experiment condition significantly improved self-determination in hypothesis one when compared to the control condition, but did not differ from the control in improving perceived self-competence in hypothesis two, it can be argued that the difference between both interventions is the value alignment and autonomy aspects of the self-determination reflective writing exercise.

As the control intervention appears to be successful in improving perceived self-competence, perhaps the writing prompts from this intervention could be incorporated in the experiment condition in future studies in order to further assess their effectiveness. With the previous research indicating that higher levels of perceived self-competence can be associated with increased levels of happiness and life satisfaction (Bardeen & Fergus, 2019; van Zyl & Dhurup, 2018), better academic performance (Huerta, Goodson, Beigi & Chlup, 2016; Lane & Lane, 2001), task persistence (Baier, Markman, & Pernice-Duca, 2016) and lower levels of anxiety and depression (Tahmassian & Moghadam, 2011) it can therefore be argued that interventions to improve perceived self-competence have a strong applied value.

### **4.3 Hypothesis 3**

It was hypothesised that females in the experiment condition would experience a significantly greater increase in self-determination than males following the self-determination theory based reflective writing exercise. An independent samples t-test revealed that there was no significant difference of change scores between males and females, thus failing to reject the null hypothesis. As the research articulates that females experience higher self-determination than males, it was anticipated that the SDT based intervention would have a greater effect on females. Findings by Boyd (2017), D'Lima, (2014) and Heppler (2016) provided the theoretical basis for this hypothesis. Therefore, this study put forward the argument that if females experience more self-determination than males, a brief SDT based intervention may have a

greater effect on females. The results from this analysis are more in alignment with the findings posited by Guerin and colleagues (2012), who revealed that across 27 previous studies, the gender differences in relation to self-determination were non-significant. This would support the lack of a gender difference in the effectiveness of the intervention, as if there is no difference between males and females in relation to self-determination, then it would be expected that they would not differ in their experience of the self-determination intervention. However, it is important to consider that this study exhibited a small sample of male participants within the self-determination intervention condition with only 22 male participants. The study size indicates low power, and it is not possible to generalise the findings to the wider population.

#### **4.4 Hypothesis 4**

It was hypothesised that older participants in the would experience the lowest change in self-determination in comparison to the younger groups. A one-way between groups ANOVA revealed that there was no significant difference across age groups, thus failing to reject the null hypothesis. However, this study consisted mostly of younger and middle aged participants, with only one participant over the age of 60 being allocated to the self-determination intervention condition. Therefore, these findings are not representative of the general population. No significant differences were evident between any of the four age groups in the current study. The research conducted by Sheldon, Houser-Marko and Kasser (2006) which indicated that older adults are more likely to experience self-determination, consisted of 175 participants, with a sufficient number of participant in each group as per Cohens power primer (Cohen, 1992). The same is true for Mackenzie, Karaoylas and Starzyk (2017), whose research consisted of 198 participants: 66 in each age range. A direct comparison can therefore not be made between the current study and previous research.

#### **4.5 Applied value**

The applied value of the current study is supported by two key research areas: First, the positive impact that being self-determined appears to have on areas such as wellbeing, life satisfaction, success, and learning, as supported and outlined in chapter one, and second, the lack of PPI's which implement SDT. As the research outlines why being self-determined is important and how it can benefit people, it seems counterproductive that SDT is not disseminated to the general population in a way in which it is easy to understand and implement. Therefore, the current study has a strong applied value as it aims to address this issue. As the intervention in the current study is universal, it may be used for any goal – though it is important to consider that the findings in the current study are tentative. The intervention itself could be administered in schools, universities, working environments, however most importantly, the intervention can be practiced by the participant on their own. Much in the same way that a person can write a gratitude list or a three good things list, so too could they take part in reflective writing guided by self-determination. It is important therefore to consider the dissemination plan for the research.

#### **4.6 Dissemination plan**

There is a need for more research to assess the effectiveness of the SDT-based intervention in the present study, therefore dissemination is crucial. To begin with, it is aimed to present the research at the PSI Annual Student Congress in 2021 and the DBS Psychology Poster Conference and on LinkedIn. The research is also being put forward to be made available online through Dublin Business School e-source which would make the research searchable on platforms such as google scholar. The research will be submitted to the Applied Psychology Journal and The Journal of Positive Psychology in order to be considered for publication. Dissemination of the study will focus predominantly on spreading the findings throughout the academic community for future studies, as the findings are not yet

supported enough to inform the general population that the intervention will help them to increase their self-determination. This is an important ethical consideration in dissemination. However, dissemination of the fundamentals of SDT could be made more easily available to people in order for them to learn about SDT.

#### **4.7 Strengths and limitations**

The current study provides a novel approach to both self-determination theory and positive psychology through creating an intervention based on previous research to address a gap in the literature surrounding self-administered PPI which are based on SDT. This is a strength of the current study as it has taken the psychological research and applied it in such a way that it is easily accessible to all people, not just academics. Though much more research will be needed in order to understand the effectiveness of the intervention, the results may be promising in light of hypothesis one results. Another strength of the current study is the randomisation in the allocation of participants into the control or experiment condition. This minimised bias and ensured that the process was ethical. As participants were not required to return their written responses to the writing exercises or to report what their chosen goal was. This reduced the likelihood of response bias from occurring while also protecting the participants privacy and anonymity, a strength of the current study. The measures used in the current study were reported as having moderate to high reliability and validity which is also a key strength of the current study. However, future studies should be able to improve upon the current study and critically assess and examine the findings. Therefore, the limitations of the study are important to consider.

With hypothesis one and two consisting of a sufficient number of participants to achieve a medium effect size at  $\alpha = .05$  with a power of .8, the sample size for these two hypotheses can be considered a strength of the current study. However, hypothesis three and four exhibited

age and gender imbalance, respectively. This greatly reduced the power of the analyses for these hypotheses thus increasing the likelihood of a type ii error. Increasing the significance criterion was considered, however this would have increased the likelihood of a type I error. The small sample size exhibited in the groups across hypotheses three and four is therefore a limitation of the current study. For example, perhaps a significant TSDS difference exists between males and females, or between the various age ranges, but the sample size was too small to identify it. Therefore, the results of hypotheses three and four cannot be generalized or interpreted as being an accurate representation of the population.

Continuing with the limitations of the sample within the current study, it should be noted that the descriptives analysis highlighted the lack of education and employment diversity also. In relation to education, all participants had completed their secondary level education, with the majority of participants holding an undergraduate or Master's degree. It was reported that participants who do not hold a third level education qualification only made up approximately 10% of the sample. This study put forward the aim to examine the effectiveness of a universal self-determination based intervention exercise, however the current study does not represent people from all educational backgrounds. This is a limitation of the current study. The same argument can also be made for employment status.

It could be important to consider the potential impact that the coronavirus pandemic could have had on the study. For example, autonomy may have been impacted as people were required to be in lockdown during the time that the data were collected, relatedness may have been impacted due to social isolation and working from home, and competence may have been impacted particularly amongst older adults who were asked to cocoon. Finally, as the reflective writing exercise responses from the participants were not collected from the participant as data, it is not possible to know how long each participant spent on the writing prompts, or if the even took part in the exercises to begin with. Though not collecting the participants writing exercise



responses and chosen goal was important in protecting the participants privacy and avoiding risk of response bias, it would have benefited the study to be able to categorise responses by factors such as time spent engaging in exercise.

#### **4.8 Recommendations for future research**

Though the aim of this intervention is to provide a universal SDT based reflective writing exercise, future studies could provide more specific insights into the effectiveness of the intervention in different populations in order to examine if the intervention is more effective in certain populations than others. Recruiting a larger sample size will reduce the likelihood of imbalances between gender and age. The current study was limited to recruiting participants via social media, however future research should focus on recruiting people in person also. Recruiting online may result in participants of similar backgrounds taking part in the study but neglecting other populations. This could result in a type of bias in responses. Future research should consider this when recruiting participants. Furthermore, in person assessment of the intervention should also be implemented in order to be confident that participants are taking part in the intervention (something not possible through online surveys) and record time spent engaging with the intervention in order to assess if this has an effect on the outcome. Perhaps future studies could also incorporate a qualitative element into the study in order to get a more in depth perspective on the participants experience following the intervention. In relation to the specific findings in this study, future research could aim to clarify why changes occurred in the control condition in for perceived self-competence but not for overall self-determination. Further insights into variance in gender and age responses to the intervention would also provide more insight as to the universality of the intervention and if it works for some populations better than others. The research in the current study should be treated tentatively and critiqued by future research.

## 5. Conclusion

“Motivation is what gives behaviour its energy” Reeve (1993, p. 354). As psychology is the study of behaviour, it is therefore unsurprising that research on motivation has been dominant within psychology for decades. SDT has emerged as a prominent and highly researched theory of motivation, yet, to what extent has this research been made available to the general, non-academic population? How can people incorporate self-determination into their lives? With externally motivating forces such as grades and deadlines potentially diminishing self-determination, how can psychology empower people to take control over their own levels of self-determination? The current study aimed to address these questions through means of implementing a self-determination theory based reflective writing exercise.

Guided by research on SDT itself, positive psychology and goal setting, the current study implemented a PPI style self-determination exercise which participants interacted with based on their chosen long-term goal. The findings from this study, though tentative, are exciting and promising for future research in this area. Participants who received the SDT-based intervention showed a significant increase in self-determination, while control participants exhibited no such change. Though the effect size was small, it is important to consider that the current study demonstrates immediate effects of the intervention, thus laying the ground work for future studies to assess long term implications of the intervention. Though differences in the effects of the intervention across gender and age were found to be non-significant, future research should address sample size limitations in order to provide a more reliable and generalizable analysis. As the current study is preliminary, the groundwork has been set to begin making SDT accessible to the public through PPI's.

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## Appendices

### Appendix A

My name is Katie Mulvany and I am conducting research within the Dublin Business School Department of Psychology. My research explores the factors which underly motivation and will involve a brief self-reflection exercise. This research is being conducted as part of my MSc in Applied Psychology and will be submitted for examination.

You are invited to take part in this study and participation involves completing and submitting the attached anonymous survey. While the survey asks some questions that might cause some minor negative feelings, it has been used widely in research. If any of the questions do raise difficult feelings for you, contact information for support services are included on the final page. This study will also require you to engage in a self-reflection exercise based on principals from positive psychology and motivation research. You will need a pen, paper and a quiet space to engage with and complete this study.

The findings from this study may be presented at national and international conferences and may submitted for publication. However, as participation is completely anonymous, no individual participant will be identified in any publication or presentation.

Participation is completely voluntary and so you are not obliged to take part.

Participation is anonymous and confidential. Thus, responses cannot be attributed to any one participant. For this reason, it will not be possible to withdraw from participation after the questionnaire has been collected. The questionnaire data will be securely stored on a password protected computer and all data will be destroyed according to GDPR.

It is important that you understand that by completing and submitting this questionnaire that you are consenting to participate in the study.

Should you require any further information about the research, please contact Katie Mulvany, 10509223@mydbs.ie, or to contact an independent member my supervisor is Dr Ronda Barron ronda.barron@dbs.ie

Thank you for taking the time to partake in my study.

## Appendix B



*Before beginning, you are asked to take a pen and paper and write down a goal that you are hoping to achieve within the next 1-3 years. The following questions will relate to this goal.*



## Appendix C

## Situational Motivation Scales original

Directions: Read each item carefully. Using the scale below, please circle the number that best describes the reason why you are currently engaged in this activity. Answer each item according to the following scale: 1: *corresponds not at all*; 2: *corresponds a very little*; 3: *corresponds a little*; 4: *corresponds moderately*; 5: *corresponds enough*; 6: *corresponds a lot*; 7: *corresponds exactly*.

---

Why are you currently engaged in this activity?

1. Because I think that this activity is interesting	1	2	3	4	5	6	7
2. Because I am doing it for my own good	1	2	3	4	5	6	7
3. Because I am supposed to do it	1	2	3	4	5	6	7
4. There may be good reasons to do this activity, but personally I don't see any	1	2	3	4	5	6	7
5. Because I think that this activity is pleasant	1	2	3	4	5	6	7
6. Because I think that this activity is good for me	1	2	3	4	5	6	7
7. Because it is something that I have to do	1	2	3	4	5	6	7
8. I do this activity but I am not sure if it is worth it	1	2	3	4	5	6	7
9. Because this activity is fun	1	2	3	4	5	6	7
10. By personal decision	1	2	3	4	5	6	7
11. Because I don't have any choice	1	2	3	4	5	6	7
12. I don't know; I don't see what this activity brings me	1	2	3	4	5	6	7
13. Because I feel good when doing this activity	1	2	3	4	5	6	7
14. Because I believe that this activity is important for me	1	2	3	4	5	6	7
15. Because I feel that I have to do it	1	2	3	4	5	6	7
16. I do this activity, but I am not sure it is a good thing to pursue it	1	2	3	4	5	6	7

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Codification key: Intrinsic motivation: Items 1, 5, 9, 13; Identified regulation: Items 2, 6, 10, 14; External regulation: Items 3, 7, 11, 15; Amotivation: Items 4, 8, 12, 16.



Situational Motivation Scales original – amendments are written in bold

Directions: Read each item carefully. Using the scale below, please circle the number that best describes the reason why you are currently **pursuing this goal**. Answer each item according to the following scale:

1: corresponds not all; 2: corresponds a very little; 3: corresponds a little; 4: corresponds moderately;

5: corresponds enough; 6: corresponds a lot; 7: corresponds exactly.

Why are you currently engaged in this activity? [each of the following will correspond with a likert type scale ranging from 1 – 7 (see above)]

1. Because I think that this **goal** is interesting
2. Because I am doing it for my own good
3. Because I am supposed to do it
4. There may be good reasons **to pursue this goal**, but personally I don't see any
5. Because I think that this **goal** is pleasant
6. Because I think that **the outcomes of this goal** will good for me
7. Because it is something that I have to do
8. I am **pursuing this goal**, but I am not sure if it is worth it
9. Because it is fun
10. By personal decision
11. Because I don't have any choice
12. I don't know; I don't see what **this goal** will bring me
13. Because I feel good when **working towards this goal**
14. Because I believe that **this goal is** important for me
15. Because I feel that I have to do it
16. I will **pursue this goal**, but I am not sure it is a good thing **to pursue**

Total self-determination formula (Blanchard et al., 2007)

TSDS =

2\*(intrinsic motivation) + 1\*(identified regulation) – 1\*(external regulation) – 2\*(amotivation)

## Appendix D

## Perceived competence scale

Please respond to each of the following items in terms of how true it is for you with respect to your ability to achieve this goal.

Use the scale:

1	2	3	4	5	6	7
Not True			Somewhat true			Very true

1. I feel confident in my ability to reach this goal.
2. I am capable of achieving this goal.
3. I am able to achieve my long-term goal.
4. I feel able to meet the challenge of achieving my goal.

## Appendix E

Self-determination theory based reflective writing exercise

Experiment condition



*For this next part, you will need your  
pen and paper. You will be prompted  
to reflect upon your chosen goal*





*Take a moment to reflect upon your goal. Take 2-5 minutes to write about a way in which this goal aligns with your **values**. That is to say, **why is this goal meaningful to you?** Focus on how your goal relates to your core values. Some examples of core values include family, relationships, spirituality and religion, and career.*





*Take a moment to think about the skills and abilities you are required to have in order to achieve this goal.*

*Take 2-5 minutes to write about a time where you demonstrated these skills and abilities successfully.*





*We all have choices in life. You are now asked to reflect upon why you have chosen this particular goal? List 3 reasons why **you** have chosen to pursue this goal.*



## Appendix F

## Control condition exercise



*For this next part, you will need your pen and paper. You will be prompted to reflect upon your chosen goal*





*Take 2-5 minutes to write and reflect upon a time in your life when you felt motivated, and write about the factors which motivated you*







*Take 2-5 minutes to reflect upon and  
write about something that is  
motivating you towards your goal/*



## Appendix G

Thank you for taking the time to take part in my study!

The purpose of this study was to examine the impact that a self-determination theory based reflective exercise has on improving self-determination, intrinsic motivation, and perceived self-competence .

Alternatively, you may have been placed in the control condition where you will have received an alternative reflective writing exercise.

In case you experience any adverse effects that you feel result from taking part in this study, please find the list of free counselling services where you may obtain help with and anxiety or discomfort you might experience.

SOSAD Ireland: (041) 984 8754

Pieta house Ireland: 1800 247 247

The Samaritans Ireland: (01) 671 0071