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Applying SMART Goal Intervention Leads to Greater Goal Attainment, Need Satisfaction and Positive Affect

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ABSTRACT

Previous research suggests that planning interventions lead to increased goal attainment, while other research suggests that goal attainment leads to increased well-being. This research integrates these two sets of research findings by investigating the effectiveness of one goal planning intervention, the SMART goal program, on goal attainment, and thus need satisfaction and well-being, in university students. An experimental design across a one-week period was employed to test whether participants in the experimental group, who received the SMART goal instructions, better obtained their goal in comparison to control group participants who did not receive those specific instructions. Findings indicated that the SMART goal program led to greater rated goal attainment and need satisfaction, but not greater subjective well-being (SWB). Nevertheless, one component of SWB, positive affect, was greater in the Experimental group. Type of individually chosen self-concordant goal content had no impact on whether participants attained their goal.

KEYWORDS

SMART goal intervention; goal attainment; need satisfaction; subjective well-being; positive affect

1 Introduction

An important aim of positive psychology is the identification of evidence-based strategies to increase individual well-being and prevent psychological ill-being [1]. The goal-based model of personality integration proposes that well-being is achieved through successfully striving to obtain personal goals [2]. In particular, striving to achieve personal goals helps people to discover different aspects of the self (i.e., identity) and also contributes to need satisfaction and thus well-being [3,4].

More specifically, self-determination theory (SDT) posits that the attainment of valued goals leads to psychological need satisfaction which in turn leads to increased well-being [5]. Specifically, a key sub-theory of SDT posits that humans are subject to the basic psychological needs of autonomy, competence and relatedness. Autonomy is the feeling of being the origin of one's own behaviors (i.e., one is not being constrained by external forces in one's choice of behavior); competence is the feeling of being effective (able to get valued things done); relatedness is the feeling of being understood and cared for by others.

In extending SDT, Sheldon and colleagues [6,7] obtained support for their self-concordance model of healthy goal striving, whereby goals chosen on the basis of personal values and developing interests (i.e., high self-concordance) are more likely to lead to the sustained goal-striving effort, which leads to greater goal attainment, thus greater need satisfaction, and thus greater well-being. The self-concordance model provides an explanation for the importance of choosing self-concordant goals in achieving increased well-being through the satisfaction of basic psychological needs [7–10].

Research on the self-concordant model refers to a specific form of well-being, Subjective Well-Being (SWB). SWB is operationalized in terms of people's evaluations of the presence of positive affect and the absence of negative affect (affective evaluations), as well as their evaluation of life satisfaction ("cognitive" evaluation of how satisfied a person is with their life as a whole) [11].

Although self-concordant goals are an important aspect of motivational theories of well-being, research has shown that another key factor in effective goal-striving is planning behavior. Plans are "… *the designs we construct to guide our attempts to reach a goal in a given environment*" [12] (p. 146). There is strong empirical evidence that planning for goals predicts well-being [13,14], and Sheldon et al. [6] have demonstrated that greater goal attainment leads to greater well-being. This study will integrate these two sets of research findings by investigating the effectiveness of a planning intervention on goal attainment, and thus need satisfaction and well-being.

One particularly popular goal planning intervention is the SMART goal strategy, first described in the management practice literature by Doran [15]. The SMART goal strategy guides a person through a number of steps in planning to achieve their goal ("S" for specific, "M" for measurable, "A" for attainable, "R" for realistic; and "T" for timely).

In terms of evidence for the effectiveness of the SMART goal strategy, an extensive literature search leads to three conclusions. Firstly, there is evidence for some components of the approach; for example, research on goal setting theory provides empirical evidence for goal specificity, including the setting of sub-goals [13,16]. Latham et al. [16] also summarized the empirical support for the positive role of commitment, which is determined partly by goal importance. There is empirical support for other components of the SMART goal strategy, such as attainability and choosing a realistic goal or sub-goal [3,17–19]. Secondly, there are documented case studies demonstrating the effectiveness of the SMART goal strategy as a whole, for example in educational settings [20]. Thirdly, SMART goal training is often embedded within a larger program, as with coaching programs, and these programs have been shown to be effective in studies using randomized control designs [21]. However, there is little evidence in the literature for the effectiveness of the SMART goal program in isolation, using a rigorous randomized control design. Moreover, there is a need to test the effectiveness of the SMART goal strategy in other populations such as university students, partly because these students may benefit from improved goal-management skills in their relatively unstructured educational and personal contexts [22].

In summary, this study investigated the effectiveness of a SMART goal intervention program in enhancing goal attainment, need satisfaction and well-being in university students. It was hypothesized that the SMART goal intervention would lead to greater goal attainment, need satisfaction, and well-being.

2 Method

2.1 Participants and Design

A total of 151 undergraduate students (mean age = 19.71; SD = 4.05; 105 females) from The University of New South Wales were recruited to take part in this study through the online SONA system. They received 2 h of course credit for participation. Data from 5 participants were excluded from the analysis because they chose religious (n = 2) or financial (n = 3) goals; the numbers were too low to include in the goal content

analyses. Thus the analyses were conducted on the data of 146 participants (mean age = 19.60; SD = 4.06; 105 females).

The primary independent variable was the intervention group (SMART/Experimental *vs.* Control), and the exploratory factor was a type of goal. The dependent variables were goal attainment, need satisfaction, and well-being. The covariates were (a) rated goal self-concordance, and (b) Session 1 need satisfaction and well-being.

2.2 Procedure and Materials

2.2.1 General Procedure

This study was approved by the UNSW Human Research Ethics Advisory Panel (Psychology) (which uses standards equivalent to the *APA Ethical Principles of Psychologists and Code of Conduct*), and participants completed the study in small groups of 2 to 5, with each group randomly assigned to experimental or control conditions. Participants completed two experimental sessions, one week apart. In Session 1, participants read the information sheet and signed a consent form. They completed the online surveys in the following order: Demographic Questionnaire, Basic Needs Satisfaction Scale, Positive and Negative Affect Schedule (PANAS), and Satisfaction With Life Scale (SWLS). All participants were then given a Goal Worksheet which asked them to write down their 3 to 5 most important goals for the coming week (i.e., the next 7 days). All participants were asked to select just one of the goals that best meet the following criterion: "*This goal is one you have chosen yourself, that matches with your interests and values. If one of the goals above does not meet this criterion, think of another one*". They were asked to write down that goal on the worksheet and told that they should take the worksheet home with them, but then bring it back to the next session. However, for the experimental group, the worksheet had additional information and tasks to be completed during Session 1. That is, for the experimental (SMART) goal, participants were required to work through the SMART goal instructions making reference to their chosen self-concordance goal. The experimental group participants were asked if they had any questions about what they needed to do both during this SMART analysis of their chosen goal, and after they had completed the task. Any questions were answered by the experimenter. Note that the control group did not receive any specific instructions about how to approach their self-concordance goal.

All participants returned one week later (Session 2), gave their worksheets to the experimenter, and completed further surveys, in the following order: Personal Goal Task, Basic Needs Satisfaction Scale, PANAS, and SWLS. The experimenter later checked that the goal specified on the worksheet in Session 1, was the same as that specified in the personal goal task in Session 2; this was the case for all participants.

2.2.2 Basic Needs Satisfaction Scale

This scale consists of 21 items with three subscales indexing the three basic psychological needs according to SDT [5]: autonomy, competence, and relatedness. Using a 7-point Likert Scale, participants rated their responses from 1 (Not at all true) to 7 (Very true). Nine of the 21 items were reversed prior to summing the scores to produce subscale and total scale scores. That is, higher scores indicate a higher level with satisfaction of needs. We modified the instructions so that ratings referred to the past week (specifically: "*Please read each of the following items carefully, and in particular think about how it relates to your activities and experiences during the past week*"). In deriving scores for the scale and subscales, we totaled the responses; however, means are provided in Table 1. Descriptive statistics and Cronbach's alpha were computed for Session 1 autonomy (M = 32.92, SD = 5.96, α = 0.70), competence (M = 26.23, SD = 5.64, α = 0.69) and relatedness (M = 42.79, SD = 7.43, α = 0.78). The total for Session 1 needs satisfaction was computed by adding the score of each subscale (M = 101.95; SD = 15.57). Descriptive statistics and Cronbach's alpha were also computed for Session 2 autonomy (M = 33.41, SD = 5.84, α = 0.64), competence (M = 27.62, SD = 5.80, α = 0.65) and relatedness (M = 43.26, SD = 7.20,

α = 0.76). The total for Session 2 needs satisfaction was computed by adding the score of each subscale (M = 104.29; SD = 15.36). These statistics are similar to Gagne's [23] and indicate adequate internal reliability [24].

Table 1: Mean and SD of each primary variable for Session 2

Variable	Experimental group		Control group	
	M	SD	M	SD
Goal attainment	73.03	17.87	64.14	17.78
Need satisfaction	108.26	14.39	100.32	15.37
SWB	0.60	1.5	−0.45	1.3
PA	3.7	0.31	2.5	0.29
NA	1.4	0.56	0.60	0.44
SWLS	3.5	0.80	3.3	0.60

2.2.3 Subjective Well-Being (SWB)

Following the classic work by Diener et al. [25], SWB, the index of well-being was computed by subtracting the Z score of PANAS-NA from the sum of the Z scores of PANAS-PA and SWLS (see next sections [6]. The mean SWB for Session 1 was −0.08 (SD = 2.18), and for Session 2 was −0.02 (SD = 2.19).

2.2.4 Positive and Negative Affect Schedule (PANAS)

This scale consists of 20 adjectives, ten being positive (*interested, excited, strong, enthusiastic, proud, determined, attentive, active, alert, inspired*), making up the Positive Affect (PA) Scale, and ten being negative (*irritable, upset, guilty, hostile, nervous, distressed, ashamed, jittery, afraid, scared*), making up the Negative Affect (NA) Scale [26]. Participants were instructed: "*Indicate to what extent you generally felt this way during the past week, that is, how you felt on average, using the following scale to record your answers: 1 = Very slightly/not at all, 2 = A little, 3 = Moderately, 4 = Quite a bit, 5 = Extremely*" [27]. For Session 1, Cronbach's alpha for the PA Scale was 0.70 and for the NA Scale was 0.73. For Session 2, Cronbach's alpha for the PA Scale was 0.80 and for the NA Scale was 0.82, which are similar to that reported by Crocker [28]. PANAS has good construct validity and reliability across different populations [29].

2.2.5 Satisfaction with Life Scale (SWLS)

The SWLS [25] contains 5 items (e.g., "In most ways my life is close to my ideal"). A 7-point Likert scale was used (0 = "strongly disagree", to 6 = "strongly agree") Adequate validity and reliability of this scale have been reported for various samples [30]. Cronbach's alpha for Session 1 was 0.75, and for Session 2 was 0.83, which is similar to that reported by Arthaud-Day et al. [31].

2.2.6 SMART Goal Instructions (Session 1 Only)

After choosing their self-concordance goal for the next week (worksheet; see general procedure section for more information), Experimental group participants were guided through a series of steps that asked them to analyze and revise their goal to make it more specific, measurable, attainable, realistic, and timely. These instructions were adapted from generally available manuals, but university-specific examples were added. They were introduced to SMART goals in the following way:

"What are SMART Goals? Think about this in relation to your selected goal for this next week. Please go through this material now, and follow each of the steps. During the week, you should refer back to this guideline which helps you to achieve your goal."

The worksheet explained the SMART acronym step by step, as exemplified below for the first step (contact authors for details; or see Bahrami [32]) for a printable version of the instructions):

"<u>SPECIFIC</u>: A specific goal has a much greater chance of being accomplished than a general goal. To set a specific goal you must answer the six "W" questions:

*Who: Who is involved?

*What: What do I want to accomplish?

*Where: Identify a location.

*When: Establish a time frame.

*Which: Identify requirements and constraints.

Why: Specific reasons, purpose, or benefits of accomplishing the goal."

2.2.7 Personal Goal Task (Session 2 Only)

This task, which enabled measurement of goal attainment, consisted of instructions that allowed assessment of participants' specific goals: "*During the past week, you were striving to achieve a specific goal that you identified in Session 1. Please write down what that goal was*". Subsequent content analysis of the answers to this question (undertaken by iterative examination of the responses by the authors) revealed four main categories: academic goals ($n = 75$; e.g., "completing an assignment"), self-development goals ($n = 26$; e.g., "to be calmer"), physical health-related goals ($n = 24$; e.g., "going to the gym"), and social goals ($n = 21$; e.g., "being with friends and family"). As mentioned above, the data of five other participants were excluded because of the low numbers indicating religious ($n = 2$) or financial ($n = 3$) goals.

To measure the percentage of **goal attainment**, the following instructions were presented on the computer screen: "*Please write down how completely you achieved that goal. Please use 0%–100% to express the state of your goal attainment.*" These instructions were followed by a question about goal self-concordance which was then measured by asking this question: "*Please indicate WHY this goal was interesting for you to achieve?*" Four possible reasons were provided: "*You pursued this goal because somebody else wanted you to, or because the situation demanded it*" (indexing external motivation); "*You pursued this goal because you would have felt ashamed, guilty, or anxious if you didn't*" (indexing introjected motivation); "*You pursued this goal because you really believed it was an important goal to achieve*" (indexing identified motivation); "*You pursued this goal because of the fun and enjoyment that it provided you*" (indexing intrinsic motivation [6,33]). The scale rating ranged from 1 (Not at all for this reason) to 9 (Completely for this reason) [6]. Following Sheldon et al. [6], the variable of self-concordance was computed by summing the intrinsic and identified scores and subtracting the introjected and external scores (Experimental Group: $M = 2.76$, $SD = 6.07$; Control Group: $M = 2.42$, $SD = 6.06$).

3 Results

The assumptions of independence, homogeneity of variance, normality and linearity of the dependent variable were satisfied. The descriptive statistics for the primary dependent variables are presented in Table 1. The Experimental group appears to rate their goal attainment as higher than the Control group, although for both, it is substantially less than complete goal attainment. The Experimental group appears to rate their need satisfaction as higher than that of the Control group, and both are above the mid-point of the scale (1–7), which suggests a reasonable amount of need satisfaction. The Experimental group

displays a substantial amount of positive affect, whereas the Control group appears to display the opposite; however, the level of negative affect and satisfaction with life as well as SWB appears equivalent for the two groups.

To test the hypothesis that the SMART goal program would lead to greater **goal attainment,** an ANCOVA of percentage goal attained was conducted, with group and goal content as independent factors, and self-concordance as the covariate. The ANCOVA results revealed that, as expected, the experimental group ($M = 73.03$, $SD = 17.87$) rated a significantly higher percentage of goal attained than did the control group ($M = 64.14$, $SD = 17.78$), $F(1, 145) = 5.47$, $p = 0.02$.

In terms of the frequencies of the different types of goal content, in the Experimental group 38 chose academic goals, 12 chose health goals, 12 chose self-development goals, and 11 chose social goals; whereas in the Control group, 37 chose academic goals, 12 chose health goals, 14 chose self-development goals, and 10 chose social goals. Chi square analysis yielded no differences in the goal content frequency pattern between groups, χ^2 (3, $N = 146$) = 0.21, $p = 0.97$. Both groups selected academic goals more than others, χ^2 (3, $N = 146$) = 0.30, $p = 0.04$.

The ANCOVA described above provided the exploratory analysis of goal content in relation to percentage of goal attainment (see Fig. 1). The analysis yielded no main [$F(3, 145) = 2.36$, $p = 0.07$] or interaction [$F(3, 145) = 0.44$, $p = 0.72$] effects for goal content.
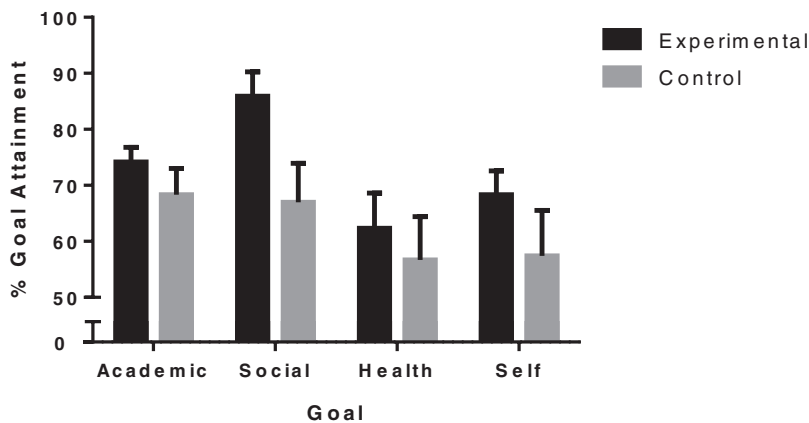

Figure 1: Mean percentage (and *SD*) of goal attainment as a function of goal content and group

The remaining aspects of the hypotheses–that the goal strategy would lead to greater need satisfaction and well-being–were then tested. Given that there were three dependent variables of interest, a MANCOVA was conducted, with goal content included as an exploratory factor (i.e., between-subjects factors: group [experimental, control] and goal content [academic goals, social goals, health goals and self-development goals]; covariates: Session 1 need satisfaction, SWB).

For **need satisfaction (NS)**, the results yielded a significant main effect for the covariate of Session 1 need satisfaction [$F(1, 146) = 22.71$, $p = 0.000$, $\eta^2 = 0.14$]. As suggested in Fig. 2, the MANCOVA yielded a significant main effect of group, [$F(1, 146) = 4.52$, $p = 0.03$, $\eta^2 = 0.03$] for Session 2 NS, with Session 2 NS being higher for the experimental group ($M = 108.26$, $SD = 14.39$) than for the control group ($M = 100.32$, $SD = 15.37$). There were no significant main [$F(3, 146) = 1.18$, $p = 0.31$, $\eta^2 = 0.02$] or interaction [$F(3, 146) = 0.37$, $p = 0.76$, $\eta^2 = 0.008$] effects for goal content with Session 2 NS.
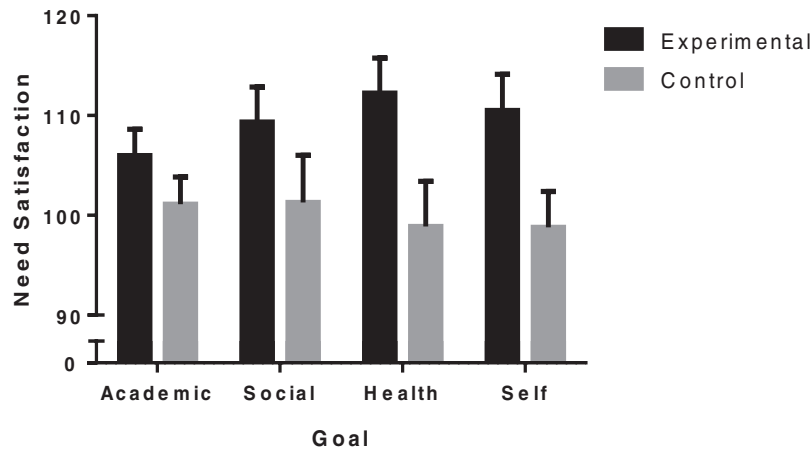
Figure 2: Mean (and *SD*) Session 2 need satisfaction as a function of goal content and group

In terms of **SWB** (see Fig. 3), the MANCOVA yielded a significant effect for the Session 1 covariate, $F (1, 146) = 71.03$, $p = 0.000$, $\eta^2 = 0.34$. Session 2 SWB ($M = -0.02$, $SD = 2.19$) was higher than Session 1 SWB ($M = -0.08$, $SD = 2.18$). However, for Session 2 SWB, there were no significant main effects for group [$F (1, 146) = 0.47$, $p = 0.49$, $\eta^2 = 0.003$] (cf. Hypothesis) or goal content [$F (3, 146) = 1.27$, $p = 0.28$, $\eta^2 = 0.02$], and no significant group × goal content interaction effect [$F (3, 146) = 1.14$, $p = 0.33$, $\eta^2 = 0.02$].
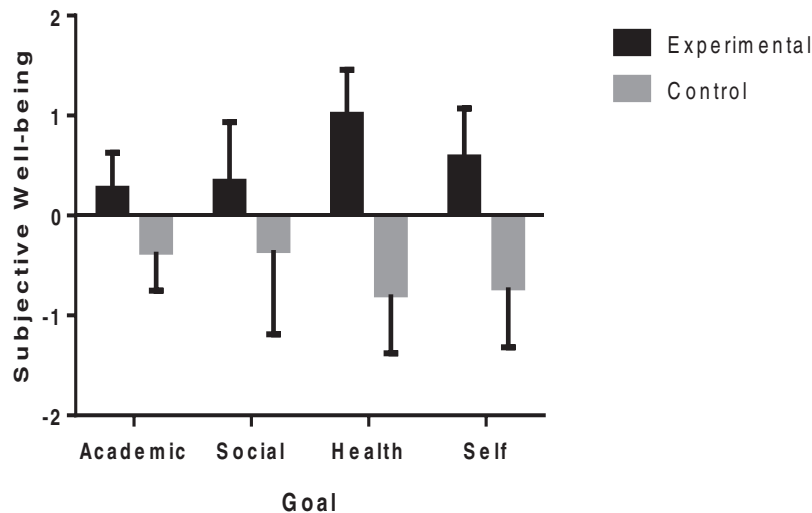

Figure 3: Mean (and *SD*) Session 2 SWB as a function of goal content and group

Exploratory analyses of the components of SWB, the PANAS subscales as well as SWLS alone, revealed that there were no significant main or interaction effects of group and goal content for SWLS [$F (1, 146) = 0.38$, $p = 0.41$, $\eta^2 = 0.006$; $F (3, 146) = 1.05$, $p = 0.43$, $\eta^2 = 0.01$] and for NA [$F (1, 146) = 0.40$, $p = 0.36$, $\eta^2 = 0.002$; $F (3, 146) = 1.14$, $p = 0.32$, $\eta^2 = 0.04$]. However, there was a significant effect for the Session 1 covariate of PA, $F (1, 146) = 63.05$, $p = 0.000$, $\eta^2 = 0.42$. Session 2 PA ($M = 3.4$, $SD = 0.20$) was higher than Session 1 PA ($M = 2.1$, $SD = 0.32$). Also the main effect of group for PA was significant; there was no interactional effect with goal content [$F (1, 146) = 1.53$, $p = 0.04$,

$\eta^2 = 1.65$; $F(3, 146) = 0.95$, $p = 0.30$, $\eta^2 = 0.07$]. The experimental group gave higher PA ratings ($M = 3.7$, $SD = 0.31$) than did the control group ($M = 2.5$, $SD = 0.29$; see Fig. 4).
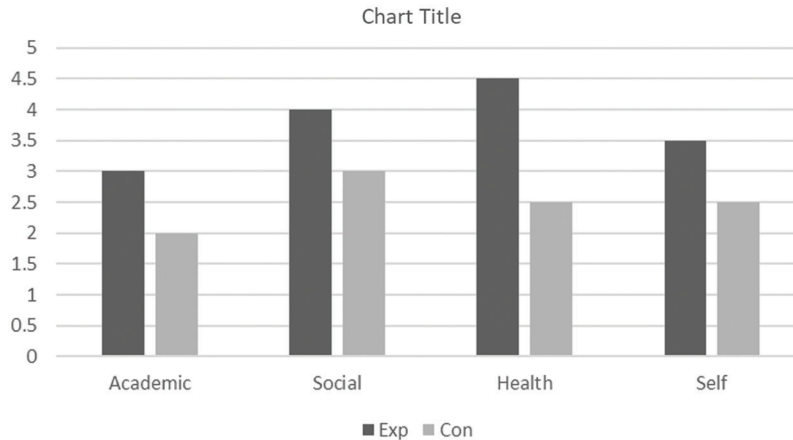

Figure 4: Mean (and *SD*) Session 2 positive affect as a function of goal content and group

4 Discussion

4.1 Summary of Findings

As expected, the SMART goal program led to greater goal attainment and greater need satisfaction. Contrary to expectation, there was no group difference for SWB. Analysis of group differences for the components of SWB revealed no differences for negative affect and SWLS, but a significantly higher positive affect for the Experimental Group. This is the first demonstration, using an experimental design, that the stand-alone SMART goal program can lead to increases in goal attainment, need satisfaction, and positive affect. Goal content (academic, health, self-development and social) did not influence the pattern of these results.

4.2 SMART Goal Program: Theoretical Implications

This is the first demonstration that a stand-alone SMART goal program has a positive impact on goal attainment, need satisfaction and positive affect. Given that both Experimental and Control groups were encouraged to focus on a self-concordant goal, it can be concluded that the SMART goal strategy effectively increased the quality of goal striving behavior (i.e., sustained effort), thus increasing goal attainment. Indeed, if participants had not been strongly encouraged to first identify a self-concordant goal, then it is unknown whether the SMART goal program would have had the same positive effect on goal attainment. This could be tested in a future replication and extension of this study, employing three groups: Self-concordant + SMART instructions; SMART instructions alone; and no self-concordant or SMART instructions. In addition, future research could systematically examine which components of the SMART goal program are the most critical in its success, so as to optimize the program for future implementations.

In terms of goal content, it is not surprising that the most frequent goal for both groups was of an academic nature, given the sample. There was no main effect of goal content on goal attainment and, despite the appearance that the attainment of social goals was influenced most by the goal program (see Fig. 1), there was no significant interaction. Future research should further investigate this finding, as it may be that the SMART goal program tends to work better for non-urgent but important goals (e.g., social goals), compared to urgent and important goals (e.g., academic goals [34]. In terms of the

generalizability of the findings of the current study, different population samples (e.g., retirees, parents, employees), with likely different categories of goal content, need to be tested. Nevertheless, it is expected that as long as the idiosyncratic goal is high in self-concordance, the SMART goal program should be effective in leading to greater goal attainment and consequent positive psychological effects.

Note that the rated percentage goal attainment was not particularly high (e.g., less than 75% in the experimental group), indicating that most participants did not completely obtain their goal. It is possible that young people tend to under-estimate how long it takes to achieve personal goals—this notion could be investigated in future research, using different age groups. Future research could also determine whether there are other modifiable factors influencing goal attainment, and seek to enhance positive influences and mitigate negative influences. Although the one-week period could be seen as a limitation of this study, shorter-term sub-goals are necessary to achieve longer-term goals.

Despite the suggestion in Fig. 3 and Table 1 of an effect on SWB of the SMART goal intervention, this trend was not significant. This outcome is puzzling, given Sheldon et al.'s [35] previous findings, and may relate to the time-frame and the most predominant goal type. Perhaps obtaining just one goal, during just one week may not have been enough to enhance subjective well-being. This is compounded by the fact that most participants reported academic goals, and even if one goal was obtained in the past week, there would be one or more new academic goals to obtain over the next week, which could then decrease one's current (Session 2) feelings of SWB. Nevertheless, the analyses of the subcomponents of SWB revealed a significantly greater positive affect for the Experimental Group, with no differences for the other two components. The replicability and nature of this effect requires further investigation. For example, research with a longer time frame could elucidate the nature of these different findings.

It should be noted that in this study, participants were asked to focus on just one goal, whereas other studies have required participants to focus on more than one goal [6,14,36]. This raises the question of whether there is an optimal number of concurrent goals one should pursue to obtain a reasonable sense of well-being. From a practical methodological perspective, in our pilot studies, we found that participants responded negatively to being asked to make the same ratings of each of multiple goals, which was one reason why we limited the request to one goal. Nevertheless, it is clear that humans constantly balance multiple goals, and so it would be worthwhile in future research to focus for example on two goals (within a particular time-frame), and examine the trade-offs and conflicts in goal pursuit (and achievement).

4.3 SMART Goal Program: Practical Implications

This study effectively targeted a relatively neglected variable in the self-concordance model–sustained effort–which is essentially goal-striving behavior. For each individual goal, there is likely a set of optimal behavioral strategies to obtain that goal, but also across all goals, there is likely to be a set of general principles. One set of principles is encapsulated by the SMART goal strategy; this study provided evidence that this strategy is effective for improving goal attainment, in a context where all participants were encouraged to choose self-concordant goals. Moreover, the goal program led to greater increases in need satisfaction and positive affect. An interesting and in many ways very positive finding is that the effectiveness of the SMART goal program is not subject to the nature of the goal that participants chose. That is, there is no evidence suggesting that the program is good for some types of goals, and not for others. Of course, more research using a wider range of goal types is required before we can confidently generalize to "most" goal types. Future research on goal-striving behavior could also benefit from employing approaches and methods derived from the organizational psychology literature [37]. In particular, coaching as a positive psychology intervention shows promise in terms of increasing valued goal attainment and subsequent happiness [38].

Although coaching practice per se was not a focus of this study, it should be noted that goal-setting and goal-striving is central to life coaching [39,40]. For example, Green et al. [40], using a cognitive-behavioral solution-focused approach, reported increased hope, subjective and psychological well-being, and progression toward goal attainment, compared to a wait-list control in the general population. Using a manualized co-coaching cognitive-behavioral solution-focused approach, Green et al. [21] reported increased cognitive hardiness and hope, compared to a comparison group, with high-school students. In a further study using a pre-post design (no comparison group), Dulagil et al. [41] found increases in well-being, hope, and progression toward personal goal attainment, but no change in depression, anxiety, stress, and progression toward academic goal attainment, following a coaching program (which included some emphasis on SMART goal training). Spence et al. [42] argued that SDT provides a useful theoretical framework to guide practice and research in life coaching. The current study provides indirect support for that argument.

Coaching in educational settings has been intensifying, and although the primary focus has been on pre-tertiary staff development and leadership, there is also increasing emphasis on coaching with students, usually through a combination of group, co-coaching and individual approaches [43]. It should be noted that the aim of the current study was not to test coaching approaches within a tertiary education setting, but rather to evaluate the effectiveness of the SMART goal strategy in increasing goal attainment, need satisfaction and well-being in university students. This difference is demonstrated by the fact that the participants were asked to choose their self-concordant goal and, although many of the students chose academic goals, they also chose non-academic goals. Nevertheless, it would be worthwhile in future research to explore the synergies between the current theory-testing approach and evidence-based applied coaching approaches.

4.4 Additional Limitations

All of the measures in this study were self-reports. Although the validity of subjective reports has been questioned in the context of understanding psychological processes, investigators of well-being have argued that subjective assessment of well-being may be best indexed by a person's self-report [44]. In particular, regardless of the nature of objective circumstances, it is how one construes such circumstances that matter in terms of experienced well-being [25]. Nevertheless, in the attempts to validate measures of well-being, and particularly in investigating the health correlates of well-being, investigators have demonstrated that self-report measures of well-being are positively associated with peer and spouse reports of well-being and with objective measures (e.g., smiling behavior, recall of events, and physiological responses) [45].

Issues of self-presentation need to be seriously considered, however. In this study, there was no particular social pressure to appear to be high in well-being, unless it was perceived by the participant that someone in authority would be viewing responses, and thus they would want to present as a psychologically 'well' student. This was unlikely to be the case given that the researcher, the first author, had minimal authority; nevertheless, the influence of the laboratory context cannot be underestimated.

The degree to which experimental participants focused on SMART goal strategies following the SMART goal analysis in Session 1 was unmonitored (as was the goal-striving activity of the control group). In future studies, self-reports of goal striving could be electronically prompted during the goal-striving period, and specific reminders could be given to the experimental participants regarding the SMART criteria. A further limitation is the time at which self-congruence was measured, which was in Session 2, rather than Session 1. Thus, it is possible that if participants did not fully attain their goal, they may then rate it as less self-congruent than they would have in Session 1. Thus in future research, this measure should be taken in both Sessions 1 and 2.

In this study, all of these goals would be characterized by Kasser et al. [46] as "*intrinsic goals*", as they are "*expressive of desires congruent with actualizing and growth tendencies natural to humans*" (p. 280). This is consistent with the instructions to participants to choose a goal that is self-concordant. Thus, the findings of this study may not be generalizable to extrinsic goals, and indeed from a theoretical perspective [6], it is predicted that this will not be the case.

5 Conclusion

The current study constituted an effort to improve the quality of goal-striving behavior, so as to increase the likelihood that (or speed at which) the goal will be obtained. We know, for example, that when students study for examinations, although the quantity of time spent studying is an important predictor of examination performance, the quality of study strategies is perhaps more important [47]. That is, the effectiveness of the behavioral strategies implemented to achieve a particular desired outcome requires critical consideration.

A positive message of this study is that it is possible for people to learn specific strategies to optimize their goal-striving behavior, which has consequences for their happiness. Firstly, when one is in the privileged position of having some choice (autonomy) regarding one's goals, it is beneficial to be able to identify goals that are self-concordant—that is, aligned with values and developing interests. However, it is the case that people have varying extents of explicit awareness of their values, strengths, interests and abilities, and so positive psychology interventions such as the VIA strengths exercise [48] or Acceptance Commitment Training's focus on values clarification [49] can help individuals to realize what values and goals are most important to them, and thus increase the likelihood of self-concordant goal choice.

Secondly, having accomplished the selection of self-concordant goals, one then needs to ascertain the most effective strategies to achieve those goals. Indeed, the concept of self-management, defined as the capacity to work effectively toward achieving meaningful goals, and to be flexible in the face of setbacks [50], has been recognized as important to students' academic and graduate career success [51]. This capacity is, of course, relevant to all domains of human functioning, and the current study is one demonstration of how individuals can learn to increase the effectiveness of their goal-striving behavior, and consequently, aspects of their well-being.

In conclusion, this study uniquely integrated two fields of research by investigating the effectiveness of one planning intervention, the SMART goal program, on goal attainment, and thus need satisfaction and well-being, in university students. This brief intervention was shown to increase reported goal attainment, suggesting that it is feasible to widely implement similar training in high-level goal setting and planning cognitive skills, which could then generalize to many life domains (e.g., employment, physical health, relationships) and thus have a significant impact on well-being.

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.

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