

Goal Motives, Approach/Avoidance Appraisals, Psychological Needs, and Well-Being: A Systematic Review and Meta-Analysis

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The self-concordance model (SCM) examines the entire sequence from goal inception to attainment and presents a framework for how outcomes vary based on the quality of motivation for goal striving. The first aim of this systematic review and meta-analysis was to synthesize a rich literature on the topic spanning over 25 years and present a cohesive picture of the associations among the SCM constructs (Model 1). The second goal was to test an alternative formulation of the model in which we (a) decomposed the self-concordance index into autonomous and controlled goal motives and (b) included antecedents, avoidance appraisals, psychological need frustration, and ill-being (Model 2). Guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses criteria, we searched six electronic databases and employed multilevel meta-analytic structural equation modeling to analyze data from 77 studies, yielding 978 effect sizes ($N = 10,289$ for Model 1; $N = 39,470$ for Model 2). For Model 1, we obtained very large associations ($r_s > .40$) among the model constructs. In Model 2, we found theoretically expected relations of at least medium effect size among all model constructs. The core assertion of the SCM, that pursuing self-concordant goals is associated with increased goal effort and attainment, psychological need satisfaction, and well-being, was supported. Furthermore, the alternative model added value by showing that the original SCM model can be broadened to integrate additional factors.

Keywords: goal motives, self-concordance model, goal attainment, psychological need satisfaction, well-being

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I've internalized my father—his impatience, his perfectionism, his rage—until his voice doesn't just feel like my own, it is my own ... I no longer need my father to torture me. From this day on, I can do it all by myself. (Agassi, 2009, p. 38)

Andre Agassi, the former world number one tennis player, described in his autobiography the toxic relationship he had with

his father, who was also his coach, using these strong words. His father made him start playing tennis as young as 2 years old. He represented a figure that always demanded perfection from his child, without allowing Agassi to have a say in his own life. Despite his record-breaking achievements, Agassi stated that he felt empty when he finally became the number one tennis player in the world in 1995. His case represents an exemplar of the notion that “not all personal goals are personal” and that goal accomplishment can sometimes diminish rather than foster well-being.

Goal pursuit is an integral element of human functioning. Society commonly praises persistent goal pursuit and attainment as a sign of durability and good character, especially if goals are difficult to attain. Within the psychological sciences broadly and the goal pursuit literature specifically, researchers have invested considerable effort in explaining the dynamics of goal setting, striving, and management (Ajzen & Kruglanski, 2019; Carver & Scheier, 1998; Locke & Latham, 2019). One of the more widely used models of goal pursuit is the self-concordance model (SCM; Sheldon & Elliot, 1999). According to the SCM, people can strive for the

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same goal for different reasons that vary along a continuum of high (e.g., values, interests, and enjoyment) to low (e.g., contingent rewards and pressure) autonomy. For example, students might differ in their reasons for pursuing the goal of obtaining a particular academic degree; some might do so because they enjoy mastery experiences and have an inherent enjoyment of the learning material, whereas others might do so because of pressure from their parents or because the degree might provide for a comfortable lifestyle in the future. The SCM has caught the attention of many researchers because it (a) differentiates between motives for pursuing goals that are congruent with the needs of the self (i.e., autonomous motives) and motives that originate outside the person's interest and values (i.e., controlled motives) and (b) makes the case that autonomous motivation for goal pursuit is more likely to result in goal attainment and enhanced psychological well-being. The SCM differs in this regard from other models (e.g., Carver & Scheier, 1998) in which the attainment of any goal, irrespective of the motivation for pursuing it, is purported to lead to psychological well-being.

There has been an accumulation of evidence on SCM's applications for more than 25 years. During this time, different parts of the model have been tested extensively, using diverse methodologies across various life domains (e.g., sport, education, and workplace), illustrating the appeal of this model. In this review, we synthesize an extensive literature on the reasons/motives for goal striving to provide a comprehensive statistical test of hypotheses regarding the motivational underpinnings of goal processes and outcomes. We also test an alternative conceptualization and potential extension to the SCM that consider autonomous and controlled motives separately as well as the role of social agents and maladaptive forms of goal striving.

An Overview of the SCM and Potential Extensions

Grounded in self-determination theory (SDT; Deci & Ryan, 1985, 2000), the SCM describes a pathway from goal motivation to well-being. At the heart of the SCM is the proposition that "not all personal goals are personal," suggesting that goals pursued with relatively more autonomous motives produce beneficial outcomes. The SCM differs from the SDT in its focus on goal selection and the process of goal pursuit. Specifically, SDT concentrates on motivation in broader terms (e.g., domains of life), whereas the SCM emphasizes how the extent to which goals are aligned with an individual's authentic interests and values is related to goal attainment and subsequent well-being. In other words, the SCM extends the SDT view of motivation to the study of goal striving. Autonomous motives reflect a person's interests/values or task enjoyment and can be effortlessly incorporated into their sense of self (Sheldon, 2014; Sheldon & Elliot, 1999). On the other hand, controlled motives are driven by internal (e.g., ego involvement) or external (e.g., pressure) contingencies. The degree of alignment or "self-concordance" between goals and people's sense of self can be conceptualized as the difference between the strength of autonomous and controlled motives. Typically, autonomous motives are calculated by combining intrinsic and identified motives; controlled motives are calculated by combining external and introjected motives. Intrinsic motives refer to engaging in an activity because it is enjoyable and satisfying. Identified motives involve doing an activity because it aligns with one's values. Introjected motives

reflect a person's partly internalized goals, as they are enacted to feel worthy or to avoid feeling guilty. Finally, external motives are driven by external factors such as rewards, punishments, or social pressure. We refer the reader to Sheldon et al. (2017) for further details on these subcategories of motivation and their relation to overarching autonomous and controlled motives. Given that goals based on autonomous motives emanate from within oneself, they are more likely to lead to sustained effort and goal attainment when compared to controlled goals that originate from outside the self (Sheldon, 2001, 2014). The attainment of autonomously motivated goals results in the satisfaction of three basic psychological needs (i.e., autonomy, competence, and relatedness), as captured within SDT, and ultimately improves psychological well-being but only when the motivation for the pursuit of these goals is autonomous. Goal self-concordance and goal attainment interact to predict psychological well-being, such that concordant goals coupled with goal attainment produce the greatest increases in well-being. This effect, however, has rarely been empirically examined, and so we excluded it from our meta-analytic review. We instead provide a narrative review of the findings.

Various research designs have been used to test the pathways of the SCM in diverse goal-striving contexts such as sports (Healy et al., 2014; Ntoumanis, Healy, Sedikides, Smith, & Duda, 2014), workplace (Bono & Judge, 2003; Sheldon & Krieger, 2014), and education (Gaudreau et al., 2012; Koletzko et al., 2015). The general theme coming out of this research is that goal pursuit is more effective for self-concordant goals (Sheldon, 2014). In the original conceptualization of the SCM, goal effort was the sole variable that was proposed to mediate the link between self-concordance and goal attainment. However, researchers have tested many other alternative variables over the years. For example, the pursuit of self-concordant goals is positively associated with goal commitment (Sheldon & Kasser, 1998), goal-related efficacy (Downes et al., 2017), and goal reengagement following failure (Ntoumanis, Healy, Sedikides, Smith, & Duda, 2014). Here, we use the term "approach/avoidance appraisals" as an umbrella term to describe all these variables. Approach is broadly used in the psychology literature to reflect increased energization of behavior toward stimuli (objects, events, and possibilities), whereas avoidance reflects energization of behavior away from stimuli (Elliot, 2013). Approach appraisals increase the likelihood of goal attainment because they encourage persistence and sustained engagement (Koestner et al., 2012; Ntoumanis et al., 2014; Riddell et al., 2022). Furthermore, sustaining effort toward self-concordant (vs. nonconcordant) goals may occur automatically and be perceived as less strenuous (Milyavskaya et al., 2021). In all, goals that reflect growth-related aspects of an individual's personality are pursued more effectively, which eventuates in higher likelihood of goal attainment.

The attainment of autonomous goals is also beneficial for the satisfaction of three universal psychological needs, conceptualized in the SDT as nutrients for the psychological growth and overall well-being of an individual. These are, as mentioned above, the need for autonomy (i.e., having volition and freedom over one's actions), competence (i.e., being able to achieve valued, skill-based outcomes), and relatedness (i.e., feeling meaningfully connected to others; Deci & Ryan, 2000). Indeed, pursuing and attaining autonomous goals are positively associated with psychological need satisfaction which, in turn, conduces to greater well-being (Bahrami & Cranney, 2018; Gillet et al., 2014; Smith et al., 2007, 2011).

Pursuing goals with autonomous motives has been linked with multiple indices of well-being, including subjective well-being (Bahrami & Cranney, 2018; Hope et al., 2019), positive affect (Gillet et al., 2014), and emotional well-being (Smith et al., 2011). Taken together, the SCM posits that goals pursued with autonomous (compared to control) motives are more likely to culminate in goal attainment. Once attained, these goals nourish the universal human needs that are crucial for well-being.

Previously, there have been three meta-analytic tests of the SCM (Gaudreau et al., 2012; Koestner et al., 2002, 2008). Koestner et al. (2002) included studies that measured goal self-concordance and goal progress ($k = 7$) and found a very large (Funder & Ozer, 2019) and positive effect size (ES; $d = 0.37$). Similarly, Koestner et al. (2008) synthesized 11 studies that measured autonomous motives, controlled motives, and goal progress and reported a very large ES ($d = 0.41$). Autonomous, but not controlled, motives were related to goal progress. Finally, in a meta-analysis of five independent samples, autonomous motives had a medium-to-large association with both self-regulation mechanisms (e.g., effort) and goal progress ($r = .28$ and $.25$, respectively); however, controlled motives had no significant associations with either of these two variables (Gaudreau et al., 2012). Although the abovementioned meta-analyses are informative, the volume of literature has increased substantially in the last 20 years. In addition, the meta-analyses tested components of the theoretical sequence rather than the SCM in its entirety. For example, psychological need satisfaction or well-being, which is integral to the SCM, was not included in any of these meta-analyses. Finally, despite the wealth of research on the topic, alternative representations or extensions to the original SCM remain untested; such testing could inform the veracity of the core hypotheses. We address these gaps by using meta-analytic structural equation modeling (MASEM; Cheung, 2015b; Jak et al., 2021). MASEM allows testing evidence for the proposed theoretical associations in the SCM in a single step while taking into account all covariances between the variables. However, as the majority of extracted data are correlational, we are unable to draw causal inferences.

Based on Sheldon and Elliot's (1999) original SCM formulation and the literature, we propose the following hypotheses (Figure 2):

Hypothesis 1 (H1): Self-concordance (autonomous minus controlled goal motives) is positively associated with approach appraisals (e.g., effort).

Hypothesis 2 (H2): Approach appraisals are positively associated with goal progress.

Hypothesis 3 (H3): Self-concordance is positively associated with psychological need satisfaction.

Hypothesis 4 (H4): Goal progress is positively associated with psychological need satisfaction.

Hypothesis 5 (H5): Satisfaction of basic psychological needs will be positively associated with well-being.

SCM—Alternatives and Extensions

Researchers have proposed multiple extensions and modifications of the original SCM model. Here, we also examined the evidence for

SCM variations that are frequently encountered in the literature. Specifically, we (a) investigated the operationalization of self-concordance as independent (but correlated) autonomous and controlled motives and (b) expanded the SCM by including antecedents of goal motivation and “dark side” variables associated with goal striving (i.e., avoidance appraisals, psychological need frustration, and ill-being) that have been included in some SCM studies as well as in the broader SDT literature.

Separating Autonomous and Controlled Motives and Including Avoidance Appraisals

People can simultaneously endorse both autonomous and controlled motives for a goal (Ntoumanis & Sedikides, 2018). Rather than calculating a single index of self-concordance (Sheldon et al., 2017), researchers often decompose self-concordance into separate autonomous and controlled components (Koestner et al., 2008; Ntoumanis, Healy, Sedikides, Smith, & Duda, 2014). In the wider SDT literature, both autonomous and controlled forms of motivational regulations (which are broader than motives specific to a goal) have also been used simultaneously. Separating autonomous from controlled forms of motivation is critical because they are frequently uncorrelated or weakly associated with each other (Milyavskaya & Werner, 2018; Smith et al., 2007, 2011) and do not necessarily predict opposite outcomes. The latter point was illustrated in meta-analyses by Koestner et al. (2008) and Gaudreau et al. (2012), in which autonomous motivation was related to goal progress and goal regulation, whereas controlled motivation was unrelated to these variables. A considerable amount of research has accumulated since these early meta-analyses, which suggests that controlled goal motives promote the use of avoidance appraisals, such as goal ambivalence and disengagement from difficult but attainable goals (Koletzko et al., 2015; Ntoumanis et al., 2014; Sanjuán & Ávila, 2019). These avoidance appraisals, in turn, are likely to conduce to poorer goal attainment (Gaudreau et al., 2012). Consequently, we propose an alternative model to address whether decomposing self-concordance into distinct autonomous and controlled motives results in differentiated relations between goal motives and appraisals in the SCM (Figure 3). We hypothesized that:

Hypothesis 6 (H6): Autonomous goal motives are positively associated with approach appraisals.

Hypothesis 7 (H7): Controlled goal motives are positively associated with avoidance appraisals.

Hypothesis 8 (H8): Avoidance appraisals are negatively associated with goal progress.

Including Antecedents of Goal Motivation in the SCM

Goal motivation may arise from contextual factors such as autonomy supportive or controlling environments (Smith et al., 2007). In a recent meta-analysis ($k = 144$), Bureau et al. (2022) investigated the antecedents of student motivational regulations. Students reported higher need satisfaction and self-determined motivation when they had autonomy-supportive teachers and parents, highlighting the role of the social environment for fostering different types of motivation. Within the context of sport and goal-specific motives,

coaches' autonomy-supportive behaviors (e.g., provision of choice and acknowledgement of negative feelings) predict athletes' autonomous goal motives (Healy et al., 2014; Smith & Ntoumanis, 2014; Smith et al., 2007). Conversely, coaches' controlling behaviors (e.g., intimidating tactics and excessive personal control) are positively associated with athletes' controlled goal motives (Smith et al., 2010). Outside of need supporting/thwarting environments, other adaptive and maladaptive contextual factors also predict motivation, such as perceived life coherence (Thomas et al., 2022), resilience (Martínez-González et al., 2021), and ego orientation (Martínez-González et al., 2022). Accordingly, in our alternative model, we also examined how adaptive and maladaptive antecedents relate to autonomous and controlled forms of motivation (Figure 3). We hypothesized that:

Hypothesis 9 (H9): Adaptive antecedents are positively associated with autonomous goal motives.

Hypothesis 10 (H10): Maladaptive antecedents are positively associated with controlled goal motives.

Including Psychological Needs Frustration and Ill-Being in the SCM

According to SDT (Deci & Ryan, 2000), satisfaction of psychological needs predicts improvements in various indicators of well-being, whereas frustration of psychological needs predicts ill-being. The original conceptualization of the SCM included need satisfaction, suggesting that the relation between autonomously motivated goals and well-being is mediated by goal progress and need-satisfying experiences but excluded need frustration (Sheldon & Elliot, 1999). As a further extension, we propose the introduction of psychological need frustration and ill-being to the SCM.

We propose that goals underpinned by controlled motives are likely to frustrate basic psychological needs because such goals misalign with a person's interests or values, conducing to increased ill-being. Exemplifying this point, controlled goal motives have been linked to increases in depression symptoms (Holding et al., 2017; Soenens et al., 2011) and biological stress (Holding et al., 2021). In our alternative model, we formally tested whether goal progress (in a negative direction) and need frustration mediate the relation between controlled motivation and ill-being. The addition of psychological need frustration to an expanded model of the SCM can provide insights into whether (controlled) goal motives contribute to need frustration experiences, and how these experiences, in turn, are associated with ill-being. Our proposed extension to the SCM thus captures the "dark" side of goal striving. We hypothesized that (Figure 3):

Hypothesis 11 (H11): Autonomous goal motives are positively associated with psychological need satisfaction.

Hypothesis 12 (H12): Controlled goal motives are positively associated with psychological need frustration.

Hypothesis 13 (H13): Goal progress is negatively associated with psychological need frustration.

Hypothesis 14 (H14): Frustration of basic psychological needs is positively associated with ill-being.

Method

Transparency and Openness

We preregistered the study protocol on the Open Science Framework (OSF) project page (<https://osf.io/gub4y>) on November 28, 2020, using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses-Protocol template (Shamseer et al., 2015). Complete data sets including study characteristics and reliability estimates, R code used for the analysis, and research materials can be found at the OSF project page (<https://osf.io/ewmab/>). We adhered to journal article reporting standards (Kazak, 2018).

Literature Search

We conducted a systematic search of the literature via five electronic databases: Web of Science (core collection), Scopus, PsycINFO, Business Source Complete, and ProQuest Dissertations and Theses. The time span of the search was from the inception of the databases until 6 July, 2022. We used a combination of Boolean search terms that focused on (a) the SCM constructs, (b) approach/avoidance appraisals, (c) psychological need satisfaction, and (d) well-being and ill-being outcomes (see [Supplemental Material 1 in the online supplemental materials](#) for full search strategy). We also conducted backward searches (i.e., manual search of the reference lists of eligible studies) and forward searches (i.e., manual examination of the articles that cited eligible studies). Finally, in view of potential publication bias, we called for any unpublished data (e.g., PhD theses) or in-progress manuscripts through listservs (i.e., the SDT listserv) and direct emails to researchers who had published more than three articles on the SCM in the last 10 years.

Eligibility Criteria

We considered primary studies eligible for inclusion when they measured goal motives (as conceptualized by SDT/SCM) and one or more of the following concepts: (a) approach/avoidance appraisals (e.g., goal effort and goal disengagement), (b) goal attainment, (c) psychological need satisfaction, and (d) well-being. We excluded studies if (a) the language of the article was not English, (b) the full text of the article was unavailable via our university library subscriptions or following direct correspondence with the author, (c) the information necessary to compute an ES was unavailable in the full-text document or following direct contact with the author, and (d) the results were from a conference abstract rather than a full text.

Article Screening

We first exported all potentially eligible articles ($N = 10,510$) into Endnote and removed duplicates. We used the cloud-based machine learning tool Research Screener (Chai et al., 2021) to semiautomate the title and abstract screening phase. According to simulation studies, systematic reviewers are highly likely to identify 100% of eligible manuscripts after scanning 50% of the total pool via Research Screener (Chai et al., 2021). The lead author (Berke Sezer) screened 50% of the initial sample of potentially eligible articles and reviewed full texts flagged for retention ($N = 293$). In case of uncertainties in both abstract and full-text screening phases, we consulted the last author (Nikos Ntoumanis) to reach a decision. A third screener (Diego Vasconcellos) checked 30% of the included articles based

on the eligibility criteria; there were no disagreements about eligibility (interrater reliability = 1.00).

Data Extraction

The lead author (Berke Sezer) extracted all data items from eligible studies using a predetermined data extraction form that can be found at the OSF project page (<https://osf.io/ewmab/>). The second author (Hugh Riddell) evaluated the accuracy and consistency of the extracted data by checking a random selection of 30% of the data extraction form (interrater reliability = .95). We resolved discrepancies through discussion among the raters. Where key information was missing in the full text, we contacted the corresponding author of eligible studies to request it. We sent these requests 7 days apart with up to two reminders. We created separate data sets for studies that measured self-concordance index and those that measured autonomous and controlled goal motives because it is impossible to combine these variables without having access to the raw data.

We used the data extraction form to code for type of publication (i.e., peer-reviewed article vs. PhD thesis), publication year, study design (e.g., cross-sectional vs. prospective), goal assignment (i.e., self- vs. researcher assigned), time lag between measurement points (i.e., initial and last) for longitudinal design studies, and context (e.g., sport, education, and workplace). With regard to sample characteristics, we coded for the collected and final sample size (if there were exclusions or dropouts), mean and standard deviation of participants' age, and percentage of female participants in the sample. Finally, in terms of study variable characteristics, we documented the conceptualization of each construct of the model (e.g., life satisfaction and subjective vitality) and its operationalization via measurement, the correlations among study variables, and the internal reliability estimates of study variables.

A range of antecedent variables have been proposed in the SCM literature, but there is no guidebook for coding them. We broadly categorized these variables as adaptive or maladaptive based on relevant conceptual arguments and intercorrelations with other model constructs. For instance, we considered resilience as adaptive because it is positively associated with proactive behaviors within adverse situations (Olsson et al., 2003). As a case in point, resilience helps athletes adapt to challenges and promote personal growth (Galli & Vealey, 2008). In contrast, we considered coaches' controlling behaviors as maladaptive because they involve limiting the autonomy of the players. These constitute contexts in which the SCM has been extensively investigated. We provided a summary table of variables categorized as adaptive or maladaptive antecedents in [Supplemental Material 2 in the online supplemental materials](#). Similarly, we coded appraisal variables as either approach or avoidance based on relevant conceptual arguments and intercorrelations with other model constructs. We included a summary table of approach and avoidance appraisal variables in [Table 1](#).

Risk of Bias

The lead author (Berke Sezer) used the Quality of Survey Studies in Psychology (Protogerou & Hagger, 2020) to assess study quality. The checklist includes 20 items that evaluate a primary study on various categories broadly covering the rationale, sampling processes, data collection, and analysis, as well as ethics. He scored each

item as “yes,” “no,” “not stated clearly,” or “N/A” (i.e., not available). He then calculated the quality score by dividing the “yes” scores by the total number of applicable items and multiplying the ratio by 100. The sixth author (Diego Vasconcellos) independently repeated the risk of bias assessments of 30% of the included articles. The interrater reliability was .83. We resolved discrepancies via discussion among the raters. Furthermore, we examined the risk of bias scores, sample size, publication status, and publication bias (using the multilevel extension of Egger's test; Fernández-Castilla et al., 2021) as moderators of the overall pooled effects. We assessed whether there was a significant difference in the obtained effects as a function of these methodological factors.

ES Benchmarks

We prioritized correlation coefficients as the ES of interest to quantify the association between two variables (for full details, see [Supplemental Material 3 in the online supplemental materials](#)). We followed the guidelines of Funder and Ozer (2019) when interpreting ESs, which suggest .05, .10, .20, .30, and .40 (very small, small, medium, large, and very large effect, respectively) as reference points for ES interpretations.

Statistical Analyses

Analysis Overview and Deviations From the Registered Protocol

In our preregistration, we planned to use two-level MASEM to examine the relationship between variables in the SCM. This approach, however, fails to account for ES dependencies in the data set, which included reporting similar operationalizations of a variable from the same sample (e.g., goal effort and goal commitment for approach appraisals) and the use of the same sample for different publications. We deviated from the preregistered protocol by conducting a three-level MASEM to account for these dependencies (Wilson et al., 2016). We extracted the correlational evidence from primary studies and carried out the analysis via the metaSEM package (Cheung, 2015a) in R (R Core Team, 2021). It is common practice to transform correlation coefficients into Fisher's z scores before running metaSEM. We back-transformed the estimates from Fisher's z scores to r values for reporting in this article. We followed best practice guidelines for handling ES dependency and investigating moderator effects in three-level meta-analytic models (Gucciardi et al., 2022). Our syntax analytical files can be found at the OSF project page.

We note that the purpose of this meta-analysis was not to test the causal structure of the SCM, given that the vast majority of the relevant literature is correlational. Rather, we collated evidence for the various associations proposed in the model. We used MASEM because it offers several distinct advantages over classic meta-analytic approaches, such as regression-based meta-analyses, which are by far the most widely reported in psychology journals. Within the MASEM framework, data from multiple studies can be incorporated into a single model and unique effects of multiple predictors can be assessed simultaneously (Jak & Cheung, 2020). For instance, where one variable within a model predicts multiple outcomes, MASEM straightforwardly allows taking the correlation between the multiple outcomes into account. Then, this is used to determine if studies with a high ES on one outcome also have higher

Table 1*A List of Approach and Avoidance Appraisal Variables Included in the Meta-Analysis*

Approach appraisal variable	Study
Effort (e.g., goal effort and sustained effort)	Bahrami and Cranney (2018), Gibbs (2017), Gillet et al. (2014), Gore and Cross (2006), Gore et al. (2009), Koestner et al. (2012), Milyavskaya et al. (2015, 2022), Sheldon and Elliot (1999), Smith et al. (2007, 2011), Vasalampi et al. (2009), Werner et al. (2016)
Goal commitment	Milyavskaya and Inzlicht (2013), Sheldon and Kasser (1998)
Implementation intentions	Carraro and Gaudreau (2011)
Self-efficacy	Downes et al. (2017), Gillet et al. (2017), Hirschi et al. (2013), Koestner et al. (2002), Valero et al. (2015)
Planning	Brunet et al. (2015), Koestner et al. (2008)
Adaptive coping (e.g., task-oriented, effort-based)	Gaudreau et al. (2012), Ntoumanis et al. (2014), Riddell et al. (2022), Sanjuán and Ávila (2019)
Adaptive engagement (e.g., goal and study)	Gillet et al. (2015), Valero and Hirschi (2016)
Goal reengagement	Haase et al. (2021), Holding et al. (2017), Martínez-González, Atienza, Tomás, & Balaguer (2021), Ntoumanis, Healy, Sedikides, Smith, and Duda (2014), Riddell et al. (2022)
Goal facilitation	Healy et al. (2016)
Challenge appraisal	Riddell et al. (2022)
Positive goal optimism	Sheldon et al. (2022)
Avoidance appraisal variable	Study
Disengagement-oriented coping	Gaudreau et al. (2012)
Maladaptive intentions (e.g., dropping out and turnover)	Gillet et al. (2017), Valero et al. (2015)
Goal interference	Healy et al. (2016)
Goal disengagement	Haase et al. (2021), Holding et al. (2017), Ntoumanis et al. (2014), Ntoumanis, Healy, Sedikides, Smith, and Duda (2014), Riddell et al. (2022), Smith et al. (2010)
Action crisis	Holding et al. (2020)
Perceived disengagement challenge	Holding et al. (2022)
Goal ambivalence	Koletzko et al. (2015)
Maladaptive coping (e.g., avoidant)	Riddell et al. (2022), Sanjuán and Ávila (2019)
Threat appraisal	Riddell et al. (2022)
Goal difficulty	Smith et al. (2010)

ESs on the other outcome. Furthermore, estimating all ESs in a single step rather than through multiple individual analyses reduces multiple testing, making MASEM a parsimonious tool for assessing the evidence for the numerous relations proposed by the SCM. The main contribution of this systematic review and meta-analysis is that it summarizes a substantial body of correlational and longitudinal literature.

Tested models deviated from the preregistered protocol in two ways. First, we opted to remove antecedents and psychological need frustration from our primary model. MASEM requires at least one bivariate correlation between any possible variable pairs; missing intercorrelations between the model variables necessitate the imputation/estimation of bivariate correlations to fit the structural equation model (Jak et al., 2021). The data set for the primary model lacked correlations between these variables and other constructs relevant to the model. Including antecedents and psychological need frustration in the model would have required us to impute 18 ESs; this imputation requirement was reduced to three when we excluded these variables (for details on ES imputation see [Supplemental Material 3 in the online supplemental materials](#)). We further decided to exclude avoidance appraisals and ill-being from the primary model because there was only a small number of ESs for these pathways and their exclusion allowed us to test a model that more accurately reflected the original SCM formulation. We retained these variables in the alternative model, as sufficient data were available in the data set of that model to test it. Second, the preregistered model addressing the separate influence of autonomous and controlled motives included a single antecedent variable that predicted both types of goal motivation. To account for the varying contributions

of antecedents that are hypothesized to influence autonomous motivation (such as autonomy support) and those that are hypothesized to have an effect on controlled motivation (such as controlling behaviors), we divided the antecedents into separate adaptive and maladaptive variables in the extended model. Figures of preregistered models included in our preregistration and those tested here can be found at the OSF page. We preregistered a second alternative model in which psychological needs predicted goal motives, but we were unable to report that model in this article because of space constraints. We refer the reader to the OSF project page for the results of that model.

Moderator Analysis

We controlled for the effect of the following potential moderator variables: publication status, publication year, mean age, the proportion of the number of female participants to total sample size, goal assignment (i.e., self-assigned and researcher assigned), the time between the initial measurement point and last measurement point (days), study context (e.g., work and sports), study quality, and study design (e.g., cross-sectional and prospective). We expected the model pathways we tested to vary as a function of publication status, goal assignment, study quality, and study design (i.e., stronger paths for published studies, self-assigned goals, high study quality, and experimental studies). We had no a priori hypotheses for the rest of the moderator variables, and so we included them for exploratory purposes. Differing from the traditional approach of moderator analysis in meta-analyses, we computed correlational effects that are adjusted/controlled for these variables in the three-level MASEM

(Wilson et al., 2016). This approach permits the inclusion of multiple sources of heterogeneity concurrently (Assink & Wibbelink, 2016) rather than individually. We present unadjusted parameter estimates for each model in [Supplemental Material 4 in the online supplemental materials](#). In the Results section, we report covariate-adjusted parameter estimates for each model.

Although we tested for moderation using the recommended approach for MASEM (Jak & Cheung, 2020; Steinmetz & Block, 2022), we also tested for moderation in more traditional ways. To this end, we conducted exploratory moderator analyses on the individual pooled bivariate correlations as is typically observed with statistical syntheses of correlational effects. We selected three key moderators (i.e., study design, study context, and study quality) when assessing heterogeneity among bivariate correlations. We selected these moderators for pragmatic reasons, as we would need to examine 29 bivariate associations per moderator. We report pertinent findings at the end of the Results section for each model.

Model Fit Indices

Given that multilevel MASEM is a relatively new way of analyzing meta-analytic data, there is an ongoing discussion as to whether “traditional” cutoff points for fit indices typically used to evaluate structural equation models can be applied to multilevel MASEM (Cheung, 2018). For example, a comparative fit index (CFI) value $> .95$ is often considered as indicating an acceptable fit for a structural equation model (Hu & Bentler, 1999); however, as that CFI strongly depends on the number of correlational ESs, its utility is reduced in MASEM (Jak, 2015). Although Cheung (2015b, p. 233) suggested that the root mean square error of approximation (RMSEA) and standardized root mean squared residual (SRMR) are preferable to CFI when evaluating the model fit, Jak (2015) highlighted the need for simulation studies to determine critical RMSEA and SRMR values, especially when the heterogeneity is unacceptable. We reported model fit indices for transparency, but we emphasize that there is no consensus as to what constitutes an acceptable fit for multilevel MASEM models (Yu et al., 2018). Hence, we reported the model fit indices without labeling them as acceptable or unacceptable.

Results

Literature Search Overview and Descriptive Statistics

We depict as a Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram (Figure 1) the entire process from study identification to inclusion along with reasons for exclusion (Page et al., 2021). We identified 323 articles for full-text screening, of which 77 (70 published and seven unpublished) were eligible for inclusion. We included 118 primary studies from the eligible articles (see [Supplemental Material 5 in the online supplemental materials](#)). We extracted 978 ESs (number of ES = 140 for the primary model, number of ES = 838 for the extended model). The final sample size was 10,289 for the primary model and 39,470 for the extended model.

We present descriptive statistics, participant characteristics, and moderator variables for the included studies in Table 2. Most primary studies were peer-reviewed and published records (92.4%). The publication year ranged from 1998 to 2022. Primary and alternative models had almost identical averages for participant age. The

percentage of female participants was also similar across models, indicating that predominantly women are recruited in the self-concordance literature. In terms of moderator variables, participants primarily pursued self-assigned goals. There were equal numbers of cross-sectional and prospective studies in the alternative models; however, more cross-sectional studies were included in the primary model. Intensive longitudinal designs (e.g., daily diary and experience sampling methods) were uncommon across both models. In prospective studies, the average time between the initial and last measurement points was 153 and 152 days for primary and alternative models, respectively. Finally, goals in participant-selected contexts were the most frequent in both primary and alternative models. These were followed by goals restricted to work and education contexts in the primary model and sports and education contexts in the alternative model.

The investigation of the number of ESs on which each model coefficient was based revealed that the “dark side” of goal striving has attracted substantially less interest from researchers in the SCM literature. The model pathways on the bottom half of the extended model (e.g., controlled goal motives and psychological need frustration) were based on ESs that ranged from 3 to 6, except for the pathway between controlled goal motives and avoidance appraisals (number of ES = 33). Nevertheless, there were considerable numbers of ESs of approach appraisals with both self-concordance (number of ES = 15) and autonomous goal (number of ES = 48) motives. We present the number of ESs for each model pathway in Tables 3 and 5.

ES Characteristics

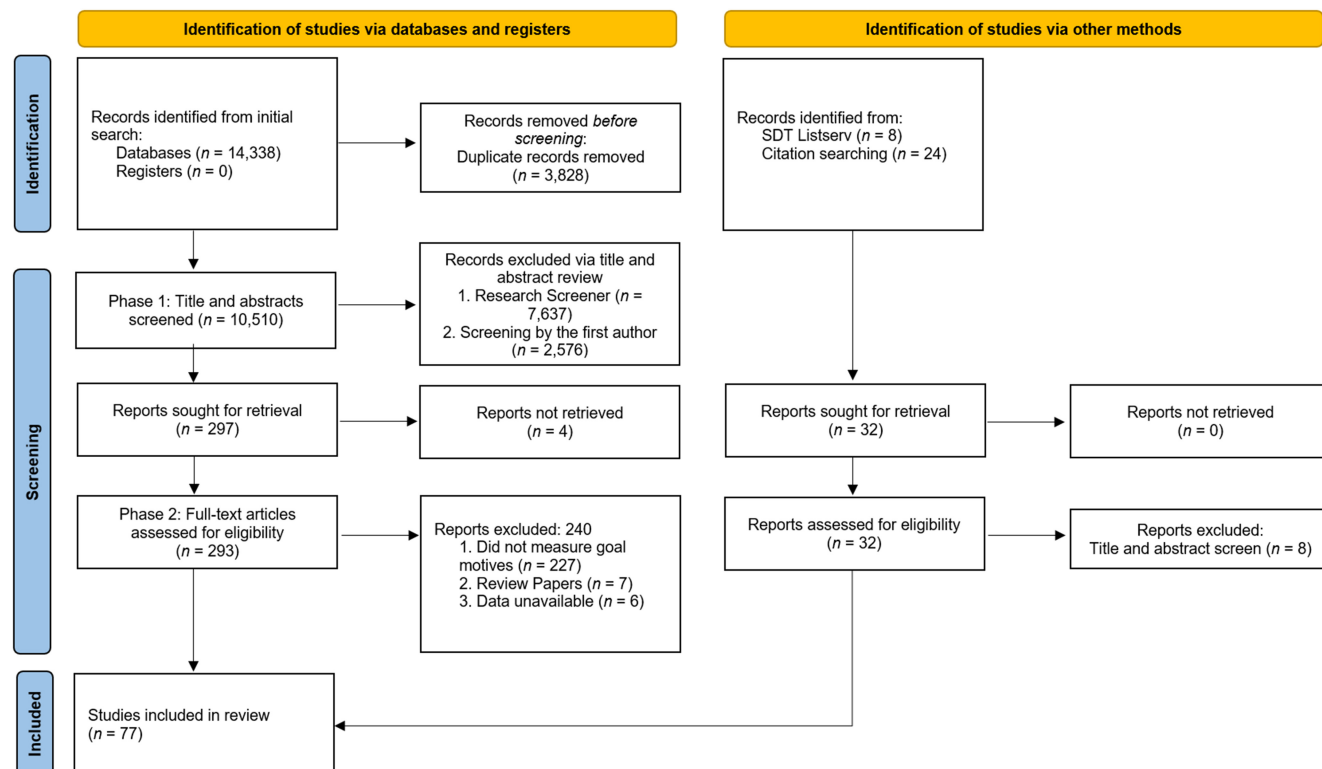
Meta-analytic ES characteristics are used to summarize and interpret the variability of ES estimates that are based on multiple studies. I^2 quantifies the proportion of variability in study outcomes that is because of actual differences between the studies rather than random chance (Borenstein et al., 2009). When I^2 is high (i.e., $>75\%$; Higgins et al., 2003), it suggests a significant variation in study results, potentially stemming from genuine distinctions among study populations. Prediction intervals, on the other hand, provide a range of likely values for the true ES in future studies. We calculated both statistics, which we present in Tables 3 and 5. Overall, the I^2 statistic showed very high variability for all model estimates. Generally, the prediction intervals of the respective ESs contained opposite effects or zeros, which is expected in meta-analyses with high variability (Int'Hout et al., 2016).

Primary Model: Expanded SCM

In the primary model, we tested the sequence from self-concordance to well-being as described by the original SCM. We present the pooled correlation matrix used to calculate the model in Table 3. Descriptively, we note a medium-sized positive association between self-concordance and goal progress. The association between goal progress and psychological need satisfaction was large and positive. Finally, we observed a very large positive relation between psychological need satisfaction and well-being.

The goodness-of-fit indices for the model were as follows: $\chi^2(5) = 1.46$, $p = .917$, CFI = 1.00, RMSEA = .000, 95% CI [lower bound, upper bound] = [.000, .005], SRMR = .034 (see [Supplemental Material 6 in the online supplemental materials](#) for the output).

Figure 1
The PRISMA Flow Diagram



Note. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses; SDT = self-determination theory. See the online article for the color version of this figure.

The intraclass correlation coefficient indicated that 3.58% of the total variance was explained by the study-level variance. We present correlational ESs (adjusted for moderating variables), 95% confidence intervals (CIs), and the explained variance for the tested model in Figure 2. All proposed pathways were statistically significant ($p < .05$). The analysis revealed a very large positive effect between self-concordance and approach appraisals. In turn, we obtained a very large positive effect between approach appraisals and goal progress. These findings support H1 and H2. In line with H3 and H4, the associations of both self-concordance and goal progress with psychological need satisfaction were very large and positive. Corroborating H5, there was a very large positive effect between psychological need satisfaction and well-being. Moreover, we obtained a small positive indirect effect ($r = .09$, 95% CI = [.05, .15]) between self-concordance and well-being via approach appraisals, goal progress, and psychological need satisfaction. The indirect effect of self-concordance on goal progress via approach appraisals was large ($r = .41$, 95% CI = [.33, .49]). We present the full range of ESs in Table 4.

To evaluate the potential effect of moderator variables, we compared the Akaike information criterion (AIC) and Bayesian information criterion (BIC) values before and after introducing the moderator variables into the models. The differences in AIC and BIC values for the primary model with and without moderators were $\Delta AIC = 0.578$ and $\Delta BIC = 0.578$, respectively, which suggest a minimal impact of these variables (Burnham & Anderson, 2004). As well as adjusting for the effects of the moderator variables on the

overall model, we conducted additional moderator analyses to examine the effects of study design, study quality, and study context on the individual bivariate correlations corresponding to the model pathways. Study context significantly moderated the association between self-concordance and approach appraisals. The effects related to this pathway were larger in studies conducted within education context and were smaller in studies conducted on health, life, and work-related goals. We present the full results of this moderator analysis in Supplemental Material 6 in the online supplemental materials.

The original SCM posits that need satisfaction is predicted by the interaction between self-concordance and goal attainment. We were unable to integrate this interaction into our models because including interaction effects in MASEM requires access to the raw data. Nonetheless, recognizing the importance of this interaction term, we provide a narrative summary of the $k = 5$ studies in which it has been included. The initial findings for this interaction came from Sheldon and Elliot (1999). Participants reported higher well-being ($\beta = .11$, $p < .05$) in Study 1 and more psychological need satisfaction ($\beta = .21$, $p < .05$) in Study 3, if their attained goals were self-concordant. Subsequent studies that have tested this interaction reported inconsistent findings. Bahrami and Cranney (2018) found a significant effect of the self-concordance and goal attainment interaction ($\beta = .19$, $p < .05$); yet, the model fit improved when these authors removed the interaction term from the proposed model. Werner and Milyavskaya (2018) conducted a prospective study in

Table 2
Summary Statistics of Individual Studies

Study and participant descriptives	Summary statistics	
	Primary model (<i>k</i> = 34)	Alternative model (<i>k</i> = 84)
Publication status (published)	32	77
Publication year	2,010.5	2,015.11
Participant age	23.40	23.87
Participant sex (female %)	67.25	59.84

Theoretical moderators	Summary statistics	
	Primary model	Alternative model
Goal assignment		
Self-assigned	31	73
Other-assigned	3	10
Study design		
Cross-sectional	19	38
Daily diary/experience sampling method	1	3
Prospective	14	42
Study context		
Goals in participant-selected contexts	20	33
Education	5	17
Work	7	14
Physical activity/sports	1	21
Health	1	0
Relationships	0	3
Religion	0	1
Experimental context	0	3
Time lag	153.43	152.94

Note. The alternative model includes an imputed study.

which participants pursued three personal goals over a week. The interaction term was not significant at the within- and between-person levels. Finally, in an unpublished study, Gibbs (2017) reported that, when need satisfying experiences were regressed on self-concordance, goal attainment, and their interaction term, both self-concordance and goal attainment were positive and significant predictors of need satisfaction, but the interaction term negatively predicted need satisfying experiences ($\beta = -.19$, $p < .01$), which is contrary to the SCM.

Extended Model: Introducing Additional Constructs

In the extended model, we tested strength of associations between variables in a variant of the SCM that (a) disentangled the individual

contributions of autonomous and controlled goal motives and included (b) antecedents to goal motives, (c) avoidance appraisals, (d) psychological need frustration, and (e) ill-being.

We present the pooled correlation matrix used to calculate the model in Table 5. Autonomous goal motives had a medium positive association with goal progress, but there was no correlation between controlled goal motives and goal progress. Goal progress had a medium positive association with psychological need satisfaction and a small negative association with psychological need frustration. We found very large positive relations between psychological need satisfaction and well-being, and between psychological need frustration and ill-being.

The goodness-of-fit indices for the model were: $\chi^2(38) = 102.00$, $p < .001$, CFI = .926, RMSEA = .007, 95% CI [lower bound, upper bound] = [.005, .008], SRMR = .135 (see Supplemental Material 7 in the online supplemental materials for the output). The intraclass correlation coefficient indicated that 2.8% of the total variance was explained by the study-level variance. We present correlational ESs, 95% CIs, and the explained variance for associations between model variables in Figure 3. All pathways in the model were statistically significant ($p < .05$). Consistent with H6, ESs were very large and positive for relations between autonomous goal motives and approach appraisals. Likewise, controlled goal motives had a medium positive effect on avoidance appraisals, which supported H7. Corroborating H8, we found a medium and negative effect between avoidance appraisals and goal progress. We observed a very large positive association between adaptive antecedents and autonomous goal motives. Similarly, we observed a large positive effect between maladaptive antecedents and controlled goal motives. Together, these results support H9 and H10.

Further, in accordance with H11, the association between autonomous goal motives and psychological need satisfaction was very large and positive. Similarly, there was a large positive effect between goal progress and psychological need satisfaction. The ES for the association between psychological need satisfaction and well-being was also very large and positive. Consistent with H12, we found a very large positive effect between controlled goal motives and psychological need frustration. Supporting H13, we obtained a medium, negative effect between goal progress and psychological need frustration. We obtained a very large positive effect between psychological need frustration and ill-being, which was in line with H14. Finally, this model replicated the very large and positive effect between approach appraisals and goal progress that we obtained in our primary model. We present the full range of ESs in Table 6.

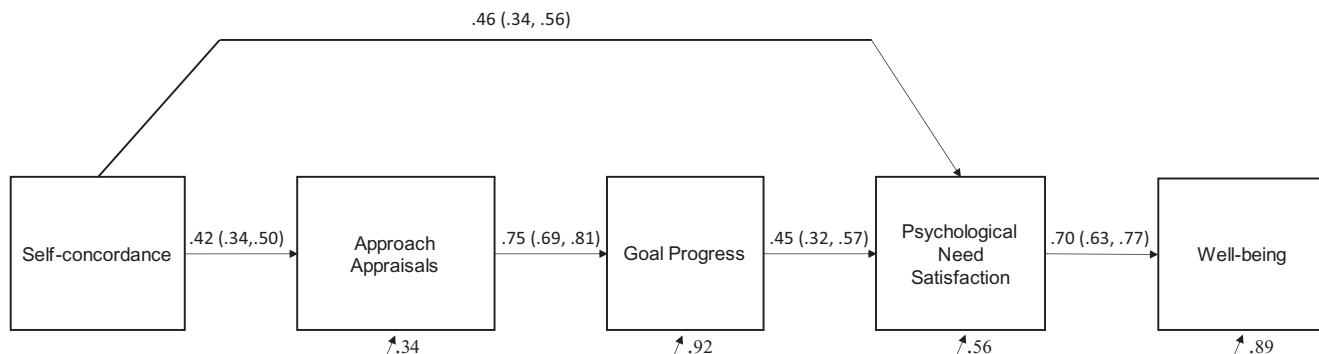
In addition, the indirect effect of adaptive antecedents on well-being via autonomous goal motives, approach appraisals, goal

Table 3
Unadjusted Bivariate Associations Between the Primary Model Constructs

Model constructs	1	2	3	4	5
1. Self-concordance	—				
2. Approach appraisals	.29* (15)	—			
3. Goal progress	.26* (24)	.76* (14)	—		
4. Psychological need satisfaction	.46* (11)	.45* (5)	.51* (7)	—	
5. Well-being	.39* (28)	.38* (11)	.47* (15)	.70* (10)	—

Note. The number of effect sizes used for computing each correlation is given in parentheses.

* $p < .001$.

Figure 2*The Covariate-Adjusted Effects Between the Primary Model Constructs*

Note. For clarity, we present only latent factors. We present confidence intervals for the estimates in parentheses. All model paths are statistically significant ($p < .05$). Arrows pointing to dependent variables indicate explained variance (R^2).

progress, and psychological need satisfaction variables was very small and positive ($r = .002$, 95% CI = $[8.82e-04, 3.70e-03]$). The indirect effect of maladaptive antecedents on ill-being via the variables at the lower half of the model was very small ($r = 1.56e-05$, 95% CI = $[8.51e-07, 9.90e-05]$). The indirect effect of approach appraisals in the relation between autonomous goal motives and goal progress was medium ($r = .26$, 95% CI = $[-.21, .31]$); the indirect effect of avoidance appraisals in the relation between controlled goal motives and goal progress was very small ($r = -.06$, 95% CI = $[-.10, -.03]$).

The differences in AIC and BIC values before and after introducing the moderator variables into the model were $\Delta AIC = 4.650$ and $\Delta BIC = 4.651$, respectively. These values indicate that including study characteristics into the model had a small influence (Burnham & Anderson, 2004). The results of the additional analyses to investigate the effects of moderators on individual bivariate correlations showed that study design significantly moderated the association between controlled goal motives and psychological need frustration, whereby cross-sectional studies that tested this association had larger ESs than prospective studies. Study quality moderated the associations between adaptive goal regulatory variables and goal progress, and between psychological need frustration and ill-being. We noted that, as study quality increased, the association between adaptive goal regulatory variables and goal progress was reduced, whereas the association between psychological need frustration and ill-being increased. Finally, study context moderated the associations between maladaptive antecedents and controlled

goal motives, and between controlled goal motives and psychological need frustration. The associations between maladaptive antecedents and controlled goal motives were largest in studies conducted within the sports context. The associations between controlled goal motives and psychological need frustration were larger in studies conducted within the context of social networking sites. We present the full results of this moderator analysis in [Supplemental Material 7 in the online supplemental materials](#).

Risk of Bias

We conducted the risk of bias assessments for each primary study, except for unpublished studies ($n = 3$) because we were unable to assess all elements of the risk of bias checklist for these studies. The mean study quality score for all included studies ($N = 77$) was 53.44 ($SD = 14.12$), ranging from 20 to 90, with a median score of 55. The item-level examination revealed that most of the studies (87%) did not provide justification for their sample size or the criteria for participant inclusion to the study. Nevertheless, we deemed the majority of those studies adequate in terms of defining the problem or phenomenon under investigation and stating specific research questions or hypotheses. We present the risk of bias assessment for each study in [Supplemental Material 8 in the online supplemental materials](#). For meta-bias, we conducted a series of moderator analyses to examine the influence of methodological factors on overall pooled effects, including the multilevel extension of Egger's test (Fernández-Castilla et al., 2021), publication status, sample size,

Table 4*Covariate-Adjusted Estimates and Effect Size Characteristics of the Primary Model*

Path in theoretical sequence	Number of ES	n	Estimate	95% CI LB	95% CI UB	I^2	95% PI LB	95% PI UB
Self-concordance → approach appraisals	15	2,646	.42	.34	.50	94.44	-.08	.77
Self-concordance → psychological need satisfaction	11	2,747	.46	.34	.56	95.12	.11	.84
Approach appraisals → goal progress	14	2,357	.75	.69	.81	93.21	.55	.94
Goal progress → psychological need satisfaction	7	1,105	.45	.32	.57	92.14	.23	.88
Psychological need satisfaction → well-being	10	2,592	.70	.63	.77	95.26	.38	.91
Indirect effect from self-concordance to well-being			.09	.05	.15			

Note. ES = effect sizes; 95% CI LB = 95% confidence interval lower bound; 95% CI UB = 95% confidence interval upper bound; I^2 = heterogeneity statistic; 95% PI LB = 95% prediction interval lower bound; 95% PI UB = 95% prediction interval upper bound.

Table 5
Unadjusted Bivariate Associations Between the Extended Model Constructs

Model constructs	1	2	3	4	5
1. AANT	—				
2. MANT	-.30* (4)	—			
3. AGM	.29*** (14)	-.15 (6)	—		
4. CGM	-.15 (12)	.19 (6)	<.01 (76)	—	
5. App. App.	.17 (5)	.12 (1)	.38*** (48)	<.01 (49)	—
6. Avo. App.	-.02 (5)	.16 (1)	-.15** (31)	.21*** (32)	-.02 (21)
7. GP	.21* (6)	-.07 (1)	.28*** (42)	-.02 (40)	.61*** (28)
8. PNS	.45*** (5)	-.16 (1)	.32*** (23)	-.22*** (20)	.28*** (9)
9. PNF	-.54* (1)	.56* (1)	-.15 (5)	.34** (5)	.04 (1)
10. WB	.32*** (9)	-.04 (3)	.32*** (56)	-.12*** (53)	.43*** (25)
11. IB	-.19 (5)	.16 (2)	-.10 (23)	.28*** (25)	-.01 (8)
	6	7	8	9	10
6. Avo. App.	—				
7. GP	-.19** (13)	—			
8. PNS	-.20 (1)	.27*** (14)	—		
9. PNF	.20 (1)	-.15 (3)	-.65*** (3)	—	
10. WB	-.24** (10)	.37*** (23)	.54*** (17)	-.30* (3)	—
11. IB	.14 (5)	-.18* (9)	-.35*** (6)	.68*** (5)	-.27*** (17)

Note. The number of effect sizes used for computing each correlation is given in parenthesis. AANT = adaptive antecedents; MANT = maladaptive antecedents; AGM = autonomous goal motives; CGM = controlled goal motives; App. App. = approach appraisals; Avo. App. = avoidant appraisals; GP = goal progress; PNS = psychological need satisfaction; PNF = psychological need frustration; WB = well-being; IB = ill-being.

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

and risk of bias scores. The results pertaining to the primary model suggested no evidence for the moderating effect of publication bias as determined by the Egger's test, $F(1, 138) = 0.95$, $p = .392$, publication status, $F(1, 138) = 0.06$, $p = .795$, sample size, $F(1, 138) = 1.52$, $p = .219$, and risk of bias scores, $F(1, 138) = 1.76$, $p = .186$. In the alternative model, we found no significant effect for publication bias, $F(1, 835) = 0.95$, $p = .328$, publication status, $F(1, 835) = 0.015$, $p = .901$, sample size, $F(1, 835) = 0.190$, $p = .662$; however, risk of bias scores showed a moderating effect, $F(1, 835) = 4.98$, $p = .026$, suggesting ESs got bigger as study quality decreased, even though the coefficient was minimal ($\beta = -.002$, $SE = 0.001$).

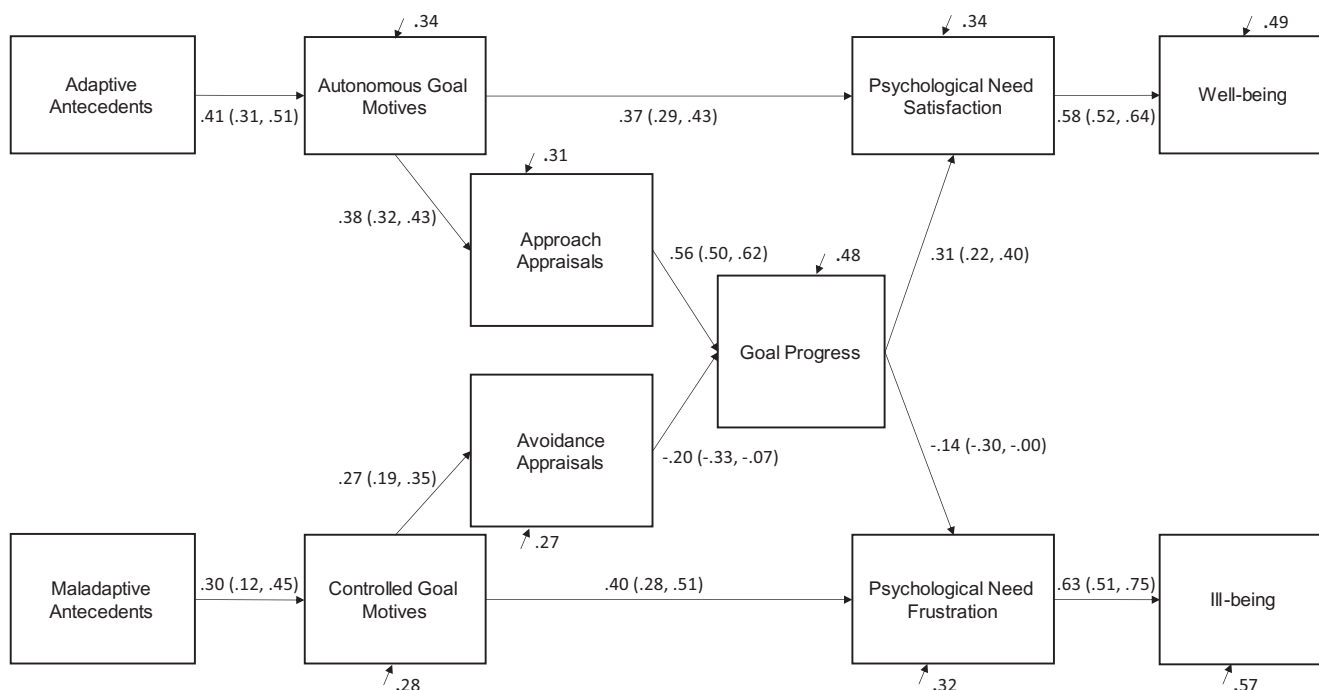
Discussion

Via a systematic review of the literature and meta-analysis of primary data, we quantitatively synthesized the SCM literature on goal motives and interrogated the motivational underpinnings of goal processes and outcomes across diverse life domains. We found support for all our hypotheses across the primary and alternative models. All statistical associations were of at least medium ES, thereby suggesting that each variable within the tested models is important in understanding the overall process from goal inception to goal attainment and related outcomes. Our results support the SCM and extend it by distinguishing autonomous from controlled goal motives, including antecedents, avoidance appraisals, ill-being, and psychological need frustration. We elaborate on each of these contributions next.

The results pertaining to the primary model are consistent with the original conceptualization of the SCM. Self-concordance predicted approach appraisals (e.g., goal effort and goal commitment) which, in turn, were associated with higher goal progress. The link between approach appraisals and goal progress was notably high, partly because of common method variance. Nevertheless, this finding is

unsurprising as some of the most frequent appraisals (e.g., sustained effort) are indispensable for goal attainment. Regardless, these variables cannot be equated to each other, as they are conceptually distinct. The distinction between appraisals and goal progress is not unique to the SCM; it is also made in other models of goal pursuit (e.g., Carver & Scheier, 1998). Progressing toward goal attainment or attaining a goal was related to higher psychological need satisfaction, which, in turn, predicted greater well-being. These findings align with theoretical expectations. Self-concordant goals are easier to pursue and attain because they reflect personal interests and are internalized more readily than nonconcordant goals (Werner & Milyavskaya, 2019). Progressing and ultimately attaining self-concordant goals constitutes a rewarding experience and entails a range of benefits for psychological health. We excluded direct links between goal motives and goal progress in our models for consistency with the original conceptualization of the SCM. However, our results are in line with the two previous meta-analyses of the SCM literature (Gaudreau et al., 2012; Koestner et al., 2002), which tested the direct link between self-concordance and goal progress and reported similar-sized positive relations (Tables 2 and 4).

We extended the work on the SCM by testing an alternative model where we decomposed self-concordance into autonomous and controlled goal motives and included interpersonal and dispositional antecedents of goal motives, avoidance appraisals, psychological need frustration, and ill-being. This alternative model integrates several variables that were not considered in the original SCM formulation but have since been argued to play various roles in the sequence from motivation to well-being. Our alternative model thus provides a more comprehensive picture of the goal striving processes. Adaptive antecedents had a positive association with autonomous goal motives, which predicted approach appraisals and psychological need satisfaction. Approach appraisals were positively linked with goal progress,

Figure 3*The Covariate-Adjusted Effects Between Extended Model Constructs*

Note. For clarity, we present only latent factors. We present confidence intervals for the estimates in parentheses. All model paths are statistically significant ($p < .05$). Arrows pointing to dependent variables indicate explained variance (R^2).

which, in turn, predicted psychological need satisfaction. There was a positive association between psychological need satisfaction and well-being. On the other hand, maladaptive antecedents predicted controlled goal motives which, in turn, were associated with avoidance appraisals and psychological need frustration. The association between avoidance appraisals and goal progress was negative. Further, goal progress of controlled goal motives predicted psychological need frustration which, in turn, predicted ill-being.

The addition of antecedents to motivation represents a key contribution of our alternative model, given that the SCM does

not model how the motivation for goal pursuit is developed. Corroborating and extending earlier empirical findings (Bureau et al., 2022), adaptive antecedents (i.e., need supportive social environments and adaptive personality factors) were associated with autonomous goal striving, whereas maladaptive antecedents (i.e., need thwarting environments) were linked to controlled goal striving. These results support our decision to include antecedents into the model, as they demonstrate that the motivation for pursuing a goal does not evolve in a vacuum but rather can be facilitated by both the social context (e.g., close others'

Table 6*Covariate-Adjusted Estimates and Effect Size Characteristics of the Extended Model*

Path in theoretical sequence	Number of ES	<i>n</i>	Estimate	95% CI LB	95% CI UB	I^2	95% PI LB	95% PI UB
Adaptive antecedents → autonomous goal motives	14	4,413	.41	.31	.51	95.73	-.19	.68
Autonomous goal motives → approach appraisals	48	13,761	.38	.32	.43	94.73	-.13	.69
Autonomous goal motives → psychological need satisfaction	23	12,975	.37	.29	.43	97.44	-.18	.67
Approach appraisals → goal progress	28	7,136	.56	.50	.62	93.93	.09	.79
Goal progress → psychological need satisfaction	14	2,716	.31	.22	.40	92.73	-.23	.65
Psychological need satisfaction → well-being	17	3,930	.58	.52	.64	93.59	.02	.77
Maladaptive antecedents → controlled goal motives	6	2,112	.30	.12	.45	95.61	-.31	.62
Controlled goal motives → avoidant appraisals	32	8,909	.27	.19	.35	94.81	-.24	.63
Controlled goal motives → psychological need frustration	5	1,427	.40	.28	.51	97.69	-.62	.26
Avoidant appraisals → goal progress	13	3,954	-.20	-.33	-.07	95.05	-.59	.31
Goal progress → psychological need frustration	3	692	-.14	-.30	-.00	93.40	-.60	.41
Psychological need frustration → ill-being	5	1,427	.63	.51	.75	94.60	.26	.87
Indirect effect from adaptive antecedents to well-being			.002	8.82e-04	3.70e-03			
Indirect effect from maladaptive antecedents to ill-being			1.56e-05	8.51e-07	9.90e-05			

Note. ES = effect sizes; 95% CI LB = 95% confidence interval lower bound; 95% CI UB = 95% confidence interval upper bound; I^2 = heterogeneity statistic; 95% PI LB = prediction interval lower bound; 95% PI UB = prediction interval upper bound.

autonomy-supportive behaviors) and the personality of the individual (e.g., resilience).

The original SCM formulation emphasized how self-concordant motivation fosters need fulfilling experiences and well-being; however, more recent evidence indicated that it is also important to consider how motives are implicated in maladaptive goal striving (Koletzko et al., 2015; Ntoumanis et al., 2014). We further extended the original SCM formulation by incorporating variables that represent the “dark side” of goal striving: avoidance appraisals (e.g., goal ambivalence), psychological need frustration, and ill-being. We showed that considering the “dark side” of goal striving is informative, particularly for understanding situations in which goal striving might fail. Controlled motives predicted avoidance appraisals that in turn were counterproductive to goal progress. Moreover, pursuing goals with controlled goal motives was associated with ill-being via the frustration of basic psychological needs. These findings bolster proposals that need frustrating experiences are relevant to ill-being as much as need satisfying experiences are relevant to well-being (Bartholomew et al., 2011; Vansteenkiste et al., 2020). Our extended models illustrate that goal motives can explain both the positive and negative aspects of goal regulation and concomitant psychological health.

Although our extended model integrates additional variables that have been considered by the wider goal-striving literature since the inception of the SCM, we emphasize that this model does not necessarily present a “better” picture of the goal regulation process than the original SCM. Occam’s razor dictates that simpler explanations are typically preferable, and it may be the case that the added complexity provided by our extended model does not contribute substantially improved explanatory power. Our purpose was not to compare the original SCM to an extended model. Indeed, it would be inappropriate to do so, given these models are partly based on different variables and data sets. Rather, the alternative model offers a more comprehensive and fine-tuned road map for understanding current thinking and evidence in the field. For example, the inclusion of antecedents into the models is valuable, as this is a potentially important extension of the SCM and adds conceptual value to the field in terms of understanding the diverse personal and contextual factors that nurture different goal motives.

We used the current best practice approach for treating moderators in MASEM, which indicated that moderator variables did not have a substantive influence on the findings. When interpreting our results, readers should keep in mind that model coefficients have been adjusted for the potential effects of moderator variables. Although our exploratory investigation of key moderators on individual bivariate correlations indicated that factors (e.g., study design) can influence the strength of associations between pairs of variables, which may be of interest for researchers investigating associations in isolation, they appear to play a minor role when considering our models as a whole.

Future Research Directions

The goal-striving field is so diverse that it is beyond the scope of this review to identify all possible ways in which the SCM literature can benefit from other related literatures, such as the ones on self-regulation (Fishbach et al., 2009) and goal systems (Kruglanski et al., 2018). In this section, we discuss four potential synergies between constructs within SCM and other models of goal regulation/striving. Our first recommendation is that researchers using the SCM consider other types of approach/avoidance appraisals

besides increased effort/persistence, as goal effort was the most prevalent form of approach appraisals that we encountered. Sheldon and Elliot (1999) focused on persistence (i.e., sustained effort) as an example of how self-concordant motivation can promote adaptive self-regulation; however, there are times when persistence is not adaptive, such as when a goal becomes unattainable. Although our results indicate that pursuing goals with self-concordant motives is associated with higher need satisfaction and well-being, researchers will do well to consider the degree of required effort and attainability of a goal using a cost–benefit analysis. Pursuing self-concordant goals does not necessarily mean that the goal will be attained or that there will be guaranteed benefits to well-being. Over time, people might come to realize that they have insufficient resources to attain the goal successfully or they might want to pursue alternative goals. Realizing that a goal has become unattainable or undesirable after investing significant resources into it might lead to a situation in which the individual experiences a motivational conflict arising from difficulties in disengaging from their goal and moving forward (i.e., action crisis; Brandstätter & Bernecker, 2022; Brandstätter et al., 2013). Action crisis is related to decreases in psychological well-being and goal progress (Ghassemi et al., 2017; Herrmann & Brandstätter, 2013; Herrmann et al., 2019). In contrast, timely disengagement from an unattainable goal and reengagement with a viable alternative can prevent a decline in psychological well-being and support adaptive goal striving (Barlow et al., 2020; Wrosch & Scheier, 2020; Wrosch et al., 2003). Also, autonomous goal motives for goal pursuit are negatively related to goal disengagement when faced with unattainable goals (Ntoumanis, Healy, Sedikides, Smith, & Duda, 2014) but positively related to goal reengagement (Riddell et al., 2022). Clearly, there is still much to be uncovered about how motives contribute to the reassessment of unattainable goals and reengagement with alternative pursuits (Ntoumanis & Sedikides, 2018). Though the SCM appears to do a commendable job of accounting for the regulation of attainable goals, future investigations should address how other approach/avoidance appraisals, such as goal disengagement/reengagement or goal pausing, can be integrated into the model and how these forms of goal regulation in turn relate to need satisfaction, need frustration, and associated well-being outcomes.

Goal pursuit rarely occurs as a continuous process in a vacuum devoid of other goals; nonetheless, much of the SCM literature considers single goals and assumes goal striving to be a relatively perennial process. Our second recommendation is that the SCM literature will benefit from examining interrelations among multiple, diverse goals, and the different time frames over which they pursue them. In the hierarchical structure of goals (Kruglanski et al., 2018), goals are interconnected within a goal system and people might follow multiple goals at a time. These multiple goals might be subordinate in pursuit of a higher-order goal (Fishbach et al., 2006) or might be competing with each other. A network analysis of these interrelations among goal systems could be a step further in the SCM research. Goals also differ in their duration (Moshontz & Hoyle, 2021); some goals can be completed in an episodic pursuit (e.g., using sunscreen before going out on a sunny day), whereas others require continuous pursuit (e.g., restricting caloric intake over time to reach a desired weight). The SCM literature has typically focused on the latter type of goals. However, studying episodic goals in this literature could be beneficial because such goals require initiation for each episode of goal pursuit (rather than constant persistence),

which might have different goal striving implications for autonomous and controlled goal motives. For example, pursuing a continuous goal with controlled goal motives might be perceived as a daunting experience, whereas interventions that target behavioral initiation (e.g., implementation intentions) might help pursuing episodic goals with controlled goal motives easier.

Our review demonstrated that the motivational underpinnings of goal pursuit can impact well-being and ill-being. Thus, our third recommendation for future research centers on potential experimental studies using elements of the SCM. For example, Ntoumanis and Sedikides (2018) suggested that mental contrasting with implementation intentions (MCII; for a review, see Oettingen, 2012) might interact with goal motives to differentially predict self-regulation of attainable and unattainable goals. Initial evidence has been consistent with this proposition. Participants with strong controlled motives who made use of MCII showed greater goal progress than those who had not received MCII training for increasingly difficult but attainable goals (Riddell et al., 2022). The results of the present meta-analysis indicate that identifying strategies to boost or support existing autonomous motivation will have flow-on effects throughout the goal striving process, which would ultimately result in improved functioning and well-being.

Our recommendation for building on the existing SCM literature is to focus on how motives affect goal striving at the level of the individual. The SCM specifies how motives prompt a person to act in pursuit of their goals, and the outcomes that they will experience. Nonetheless, few studies identified in this meta-analysis (i.e., Milyavskaya & Inzlicht, 2013; Tadić et al., 2013) used designs and methods that offer robust evidence regarding the within-person dynamics of the core propositions of the SCM. Hence, a conceptual mismatch exists between theory and much of the existing research. Future investigations could increasingly incorporate within-person designs (e.g., ecological momentary assessments and measurement burst design) to address how goal motives contribute to intraindividual variability in goal pursuit. This practice will produce closer alignment between the SCM and its empirical evidence base.

Limitations

Our meta-analysis has limitations. First, we were unable to test the interaction between self-concordance and goal attainment postulated in the original SCM because of unavailability of relevant studies. We thus cannot determine whether this interaction was tested but remained unreported because it was null. There are only a few studies that tested this interaction, with mixed results (Bahrami & Cranney, 2018; Gibbs, 2017; Sheldon & Elliot, 1999; Werner & Milyavskaya, 2018). Obviously, future research will do well to test this SCM proposition. Second, our meta-analysis was based on primarily correlational ESs, which limits understanding of the direction of effects among the examined variables. Although our models, and indeed the original SCM, allude to a generative pathway from motives to well-being, we cannot assume causality in the absence of comprehensive experimental and longitudinal evidence. Third, we based some of the associations computed for the model pathways on fewer ESs, especially those between “dark side” variables. The CIs for these associations were wider, constraining precise estimation. Fourth, we used available evidence from the primary studies to label diverse antecedents and goal regulation variables as adaptive or maladaptive. Our decision was pragmatic, as we needed to

compile evidence from diverse studies on various goals into a meaningful number of categories for the purposes of testing models via metaSEM. However, this does not mean that these categorizations are set in stone. Under certain circumstances, a variable that has mainly adaptive qualities can be counterproductive. For example, goal disengagement might be adaptive if the pursued goal is unattainable (Barlow et al., 2020; Wrosch & Scheier, 2020).

Finally, we limited our literature search to reports written in English. This may introduce a monolanguage bias (Johnson, 2021). We acknowledge that this limitation could affect the generalizability of our findings to non-English-speaking regions. However, the most prolific authors in this field have written in English. Moreover, non-English journals generally include abstracts in English; yet, we did not encounter any eligible article written in other languages. Future studies may benefit from broader language inclusivity to enhance the cross-cultural applicability of our findings.

Conclusions

The SCM has made substantial contributions to the goal-striving literature, primarily by highlighting the role of self-concordance and psychological need satisfaction in terms of goal attainment and psychological well-being. Our meta-analysis provides support for the key propositions of the model. At the same time, it identifies new opportunities to expand the scope and applications of the model by taking into consideration approach/avoidance appraisals, types of goals, intervention possibilities, and methodological designs.

Being able to identify one's interests and having the means to pursue them freely is critical. As Sheldon (2014) noted, “perhaps the only kind of free will that matters, for our lives, comes from the ability to make goal choices that allow us to act according to our genuine, self-determined inclinations, turning us into more fulfilled individuals” (p. 360). We cannot know whether Andre Agassi would still have reached world number one if his father had not forced him to play tennis since the age of two; however, we are fairly certain that he would not be as happy and successful had he not fired his father.

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