Development and Validation of the Goal Dimensions Questionnaire

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Abstract

Goals represent a central concept in the analysis of human motivation. How people evaluate their goals on dimensions like commitment or progress provides insight into motivational processes. Previously, however, goal dimension measures were often developed ad hoc and published without construct validation (Kiendl & Hennecke, 2022). To address this issue, we developed and factor-analyzed (Study 1 and 2) the Goal Dimensions Questionnaire (GDQ) for measuring 9 commonly investigated goal dimensions: commitment, demand, enjoyment, expectancy, external motivation, facilitation, progress, support, and value. In Study 1, goal expectancy, progress, and enjoyment accounted for about half the explained variance in the initial item set. We tested the construct validity of the GDQ in two longitudinal studies focusing on academic goals (Study 3) and New Year's resolutions (Study 4). For academic goals, between-person analyses suggested that higher enjoyment, expectancy, and progress as well as lower demand predicted satisfaction with performance and better grades. In Study 4, within-person analyses using random-intercept cross-lagged panel models revealed that support predicted life satisfaction one month later, and enjoyment was associated with it cross-sectionally. Cross-sectionally, enjoyment, expectancy, and progress were furthermore positively and demand was negatively associated with affective well-being on the within-person level. Exploratorily, commitment and expectancy consistently predicted goal progress. Recommendations for parsimonious measurement are derived through exploratory commonality analysis Five of the nine scales showed many of the predicted associations supporting their validity. We recommend further validation of the external motivation, support, facilitation, and value dimensions in study contexts better tailored to their influence or expression.

Keywords: goals, goal dimensions, questionnaire development, performance, well-being

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Goals such as “losing weight” or “getting an A in the math exam” are desired future states that people are committed to approach or avoid (Fishbach & Ferguson, 2007). They satisfy basic needs (Brunstein et al., 1998; McClelland, 1985, 1990), express personality (Dweck, 2017), and foster central elements of our lives, including social relationships (Gable, 2006), and well-being (Brunstein, 1993). Importantly, the extent to which a certain goal is capable of supporting people’s effort to reach desired outcomes depends on different characteristics, or dimensions, of goals (Austin & Vancouver, 1996; Fujita & MacGregor, 2012; Milyavskaya & Werner, 2018). These goal dimensions are central to different motivational theories that highlight, for example, the relevance of goal specificity and challenge for goal attainment (goal setting theory; Locke & Latham, 2002) or the relevance of goal progress for affect and self-regulatory processes (control theory; Carver & Scheier, 1998).

In the past, research considered a wide range of goal dimensions (Emmons, 1986; Karoly & Ruehlman, 1995; Klinger et al., 1981; Little, 1983). However, a recent review revealed various problems with their measurement. For example, various different items were used to measure overlapping goal dimensions, but in other cases, the same items were used to capture conceptually distinct goal dimensions, practices known to lead to jingle and jangle fallacies (Kiendl & Hennecke, 2022, see explanation below). To address the lack of a comprehensive and construct-validated taxonomy, the aim of the research described in this paper was to develop a questionnaire for the assessment of commonly measured goal dimensions, the Goal Dimensions Questionnaire (GDQ). The GDQ uses items previously used in the goal dimension literature (based on Kiendl & Hennecke, 2022). We test its structural validity by exploratory (Study 1) and confirmatory (Study 2) factor analysis, and its predictive validity based on two longitudinal studies in which it was used to predict indicators of successful goal pursuit (Study 3) and subjective well-being (Study 4).

Goals and Goal Dimensions

The ideographic-nomothetic approach is a common method for investigating goal dimensions (also referred to as “goal cognitions,” e.g., Karoly & Ruehlman, 1995, “goal characteristics,” e.g., Milyavskaya & Werner, 2018, or “goal appraisals,” e.g., Salmela-Aro et al., 2014). In this approach, participants first name their goals, such as “losing weight” or “getting an A on the math exam”. This first and idiographic part can refer to different goal concepts, such as “personal projects” (Little, 1983), “personal strivings” (Emmons, 1986), or “personal goals” (Brunstein et al., 1999a) in different domains, like work, education, or personal life. In the second and nomothetic part, participants evaluate their goals according to the goal dimensions of interest. Here, the same items are used across participants and goals, for example items measuring their goal commitment (“How committed are you to this goal?”, Koestner et al., 2015) or progress (e.g., “I have made a lot of progress toward this goal”, Emmons, 1986). Subsequently, statistical analyses can test associations between goal dimensions and other variables. Research using this approach has, for example, shown that goal commitment is positively related with goal progress (Monzani et al., 2015), consensus on goals between patients and therapists is positively related with the effectiveness of psychotherapy (Busseri & Tyler, 2004), and goal support in romantic relationships is positively related with goal enactment and relationship mood (Brunstein et al., 1996). Accordingly, the assessment of goal dimensions can be helpful in the study of a wide range of motivational variables and processes.

Problems in the Measurement of Goal Dimensions

Unfortunately, there is no consensus on which goal dimensions would constitute a comprehensive assessment of goal characteristics, and, even more critical, there is no consensus on how to measure individual goal dimensions. A review of 693 publications found that in the measurement of goal dimensions, there is a great deal of discordance, with 1,166 different dimensions that have been measured by up to 79 different items per dimension, obscuring the breadth, depth, and hierarchical structure of the dimensions (Kiendl & Hennecke,

2022). Furthermore, the same items have been used to measure different goal dimensions. For example, the item “I can definitely rely on the support of those close to me” measured the support and attainability dimensions (jingle fallacy). At the same time, very different items were used to measure the same goal dimension. For example, the items “How much do you feel you are in control of this goal?” and “How likely do you think it is for this goal to come true?” both measured the control (jangle fallacy). Such unsystematic measurement impedes comparing studies based on their goal dimensions or its items (Hodson, 2021). Moreover, the review reports that 42% of goal dimension items were reported without a reference to item sources, suggesting questionable research practices like the ad-hoc generation of items with unclear validity (Flake & Fried, 2020). Together, these results document problematic measurement practices in goal dimension research, putting the replicability of study results at risk (Lilienfeld & Strother, 2020). They demonstrate the need for a comprehensive and validated measure of goal dimensions.

We aimed to integrate previous goal dimension measures and improve future measurements by providing validated scales. Future research may benefit from converging on scales to measure goal dimensions and we suggest using the Goal Dimensions Questionnaire for this purpose.

The Present Studies

The objective of the present studies was to develop the GDQ as a tool to assess commonly measured goal dimensions. A classic road to questionnaire development starts from a construct of interest and derives scales and items that measure it (Boateng et al., 2018; Gehlbach & Brinkworth, 2011; Slaney, 2017). However, we chose a bottom-up approach because different theories and approaches suggest different goal dimensions as being important, making it subjective to choose one goal dimension over another. Furthermore, there are already theoretically derived measures (for example, see Iwama et al., 2021; Karoly & Ruehlman, 1995; Little, 1983), which, however, usually focus on a (theoretically derived) set of

dimensions but neglect others that may also be important for a comprehensive assessment of goals. Developing another top-down measure risks not clarifying but further adding to an already opaque set of goal dimensions and items. Finally, starting from current measures allows for a reorganization of current goal dimension measures, minimizes overlap, and clarifies conceptual borders.

To address our aim to develop the GDQ, we follow the three recommended phases for providing construct validity evidence of Flake et al. (2017), namely the substantive, structural, and external phases (see also Loevinger, 1957). In the substantive phase, the goal dimension scales are defined by using theories and the measure's scope is outlined, including literature reviews, item development, and scaling selection. These aspects are addressed in Study 1. In the structural phase, quantitative analyses determine psychometric properties such as the goal dimension scales' internal consistencies and factor structure. These analyses are addressed in Study 2 and partially already in Study 1. In the external phase, the goal dimensions are associated with other constructs that are expected to be related, including cross-sectional and prospective associations. This is done in Studies 3 and 4.

Study 1: Exploratory Factor Analysis

We aimed to develop a parsimonious and comprehensive questionnaire by applying exploratory factor analysis to items measuring common goal dimensions. Exploratory factor analysis is often used to identify underlying dimensions that explain the pattern of correlations among multiple items (Fabrigar et al., 1999; Flora & Flake, 2017). We base our questionnaire on Kiendl and Hennecke's (2022) review of 693 articles published between January 1970 and June 2020, which have reported measures of goal dimensions. In sum, this review identified as many as 723 different goal dimensions (that is, goal dimensions with different names) and 3,244 partially overlapping items. To use relevant and representative goal dimensions (or at least terms used for what might or might not be different goal dimensions), to meet financial constraints, and to minimize participant burden, we started with 42 *common* goal dimensions,

which were measured in at least ten publications from that time period and for which at least ten item wordings were available. Examples of goal dimensions were absorption by the goal, goal commitment, and goal progress, and the measures varied, for example, in their number of items, item wordings, and response anchors. We used three items to indicate each goal dimension in the final questionnaire to balance parsimony and comprehensiveness within and across goal dimensions.

Goal concepts vary in abstraction and temporal scope, ranging from abstract, superordinate life goals, such as “have a successful career,” to highly specific, subordinate task goals, like “go to the gym on Monday” (Trope & Liberman, 2003). The personal goals studied here are at an intermediate level, such as “exercise regularly”, which guide behaviour over weeks to years and serve as means to approach superordinate goals (Brunstein et al., 1999b). We focused on mid-level goals because task goals are too situation-specific and short-lived to meaningfully vary in goal dimensions (e.g., their value), while highly abstract goals may be too vague and removed from daily behavior. Mid-level goals strike a balance: they are concrete enough to guide action, yet broad enough to carry meaning and purpose (Emmons, 1986; McGregor & Little, 1998). Moreover, they encompass other goal concepts used in idiographic-nomothetic goal research, making them a suitable foundation for a comprehensive questionnaire (Kiendl & Hennecke, 2022; Milyavskaya et al., 2022).

Method

Participants

We used the online platform Prolific (www.prolific.com) to recruit 300 participants that currently live in the United Kingdom, have English as first language, and have at least 98 out of 100 possible approval points (indicating compliance in previous surveys). As reported elsewhere, Prolific participants show good performance in data quality tests on attention, comprehension, honesty, and reliability (Douglas et al., 2023; Palan & Schitter, 2018; Pe’er et al., 2021). We determined the sample sizes of Study 1 and 2 based on recommendations for

stable factor analyses (Mundfrom et al., 2005; Tabachnick & Fidell, 2007). From the sample, we excluded twelve participants based on two attention checks and two participants with a relative speed index (RSI) larger than two, resulting in $N = 286$ participants. The RSI indicates how much faster an individual completes the survey relative to the median completion time (Leiner, 2019). Participants received £2,25 for participation. They were, on average, 33.9 years old ($SD = 12.7$). With respect to gender, 203 (71%) identified as female, 78 identified as male, and 5 did not provide gender information.

Procedure

Participants first read a short summary of the study. They then read a prompt introducing the concept of personal goals to them:

> *Goals are projects and concerns that people think about, plan for, carry out, and sometimes (though not always) complete or succeed at. They may be more or less difficult to implement; require only a few or a complex sequence of steps; represent different areas of a person's life; and be more or less time-consuming, attractive, or urgent.*
>
> *In this line, goals are intended outcomes a person wants to attain or avoid.*
>
> *Further, we are interested in mid-level goals.*
>
> - *Mid-level goals are goals that are narrower than abstract value goals or worldviews, which are for example "earning a lot of money" or "establish world peace".*
> - *Mid-level goals are also broader than concrete task goals, which are for example "clean your bedroom" or "cook for dinner".*
> - *In terms of time, mid-level goals guide your behavior over extended periods of time ranging from weeks to years.*

Next, we provided examples of personal goals, including "*exercise regularly*" or "stop smoking". To make participants' goals more salient, they were asked to take one to two minutes

to tell us more about their goals, for which we offered leading questions like “What is the outcome that you want to attain, maintain, or avoid?” and “Why have you set this goal”? The full goal prompt for this and the consecutive studies can be accessed in the online supplement. Participants then provided a keyword summarizing each of their goals. Each goal dimension item included this keyword (e.g., “How much do you care about achieving your goal “<keyword>”?). The study ended after participants had answered the goal dimension items presented in a randomized order.

Participants’ goals spanned various topics and were classified by a research assistant using the goal domains from Oscarsson et al. (2020): work and studies (35%, e.g., “start my master course”), self-improvement (16%, e.g., “learn Latin dance”), physical health (13%, e.g., “maintain my fitness plan”), weight loss (12%), home environment (6%), finances (5%), mental health and sleep (5%), hobbies and interests (2%), friends and family (2%), eating habits (1%), tobacco habits (1%), social engagement (1%), and love (1%).

Study Material

The study was presented via the survey tool SoSciSurvey (Leiner, 2022). Goal dimension items originated from the goal dimension review of Kiendl and Hennecke (2022). Four authors of the current article, who are experts in the fields of motivational psychology and test construction, selected two to three items of 42 common goal dimensions based on how often they were measured, how well their content represented the goal dimension, and on minimal redundancy across items. This led to a selection of 95 items. Note that we did not expect to replicate the large number of 42 goal dimensions, given that these had considerable overlap anyway. Our goal was to reduce this number to a smaller set of goal dimensions. We furthermore transformed items into more general versions if they had previously been used in specific study contexts (e.g., weight loss) and changed problematic items, for example, shortened very long ones or split items that addressed multiple issues. Next, we provided each item with item-specific response options from 0 to 6 that repeated the central element in its

response format as recommended by Saris et al. (2010). Exemplary items with the goal keyword “stop smoking” are, for goal enjoyment, “How much do you enjoy working on your goal to "stop smoking”?” on a scale from 0 - *do not enjoy it at all* to 6 - *enjoy it very much* or for progress “How successful have you been with your goal to “stop smoking” so far?” on a scale from 0 - *not at all successful* to 6 - *very successful*.

Exploratory Factor Analysis

We used the psych-package (Revelle, 2024) in R (R Core Team, 2020) to determine the number of factors by the “fa.parallel” and the “nfactors”-commands and conducted exploratory factor analyses by the “fa”-command, using minimum residual estimation to extract factors. To ensure appropriate data quality, we conducted the Kaiser-Mayer-Olkin-test to measure sampling adequacy and the Bartlett’s test for variance homogeneity. We used oblimin factor rotation to allow for but minimize factor correlations as we expected correlated goal dimensions, for example the enjoyment dimension with the progress dimension, and extracted item loadings by estimating minimal squared residuals (Harman & Jones, 1966; Luo et al., 2019). We describe Item loadings ≥ .70 as excellent, ≥ .63 very good, ≥ .55 good, ≥ .45 as fair, and < .45 poor (Comrey & Lee, 1992). Furthermore, considering the diversity of goals and the wide scope of goal dimensions, we describe reliability coefficients α and ω ≥ .90 as excellent, ≥ .80 good, ≥ .70 fair, ≥ .60 acceptable and < .60 questionable (Dunn et al., 2014; McNeish, 2018). McDonald’s omega uses factor loadings and residual variances of the items to estimate the variance that is attributable to the latent goal dimension (McDonald, 1999).

We evaluated factor solutions by their interpretability and by indices that describe the quality of fit between the model and the data. Common model fit indices include the standardized root mean squared residual (SRMR). The SRMR compares the sample covariance matrix to the predicted covariance matrix and indicates misspecifications of the structural model with a recommended cutoff of ≤ .08 (Hu & Bentler, 1999). Hu and Bentler recommended reporting further either the root mean square error of approximation (RMSEA), which indicates

the deviation from the measured model to an assumed perfect model, or the Comparative Fit index (CFI), which compares the extracted model fit to a null model, to indicate misspecifications of the measurement model. The recommended cutoffs are ≤ .06 for the RMSEA and ≥ .95 for the CFI.

The number of extracted factors had to balance parsimony and fit to the data (Preacher et al., 2013). We first used computational approaches to determine the number of underlying factors in the data, on which we then based the factor analysis. The computationally suggested number of factors ranged from eight (a minimum BIC, Raftery, 1995) to nine (by parallel analysis, Horn, 1965) to twelve factors (Velicers minimum average partial, Velicer, 1976). Consequently, we conducted factor analyses with eight to twelve factors. All factor solutions showed good model fit according to the SRMR and RMSEA but missed the CFI cutoff. In a next step, we excluded factor solutions that were difficult to interpret or redundant.

After the exploratory factor analysis procedure, we named the factors based on the items with the highest loadings. We then assigned three items to measure each factor based on expert consensus regarding their relevance to the overall concept, along with high item factor loadings, low item factor cross-loadings, and minimal redundancy with other items. As our aim was to develop a comprehensive measure reflecting broad aspects of common goal dimensions, high loadings were not a strict criterion for inclusion.

Results and Discussion

We used exploratory factor analysis to reduce common goal dimension items to factors representing a comprehensive and parsimonious set of goal dimensions. The Kaiser-Mayer-Olkin test was excellent with *MSA* = .91 (Kaiser, 1970) and the Bartlett's test was highly significant $K^2(94) = 2805$, $p < .001$, indicating the applicability of exploratory factor analysis to the data. The most interpretable solution included nine factors that we termed: *expectancy*, *progress*, *enjoyment*, *support*, *value*, *external motivation*, *demand*, *facilitation,* and *commitment* (see Table 2 for more information). The nine extracted factors explained 47% of the total

variability in the data and their structure is described in Table 1. We proceeded with the nine-factor solution due to the overall adequate fit indices and the interpretability of the extracted factors.

Table 1

Extracted Factor Structure of Exploratory Factor Analysis (Study 1)

Goal dimension	SS Loadings	Proportion Var.	Factor Intercorrelations							
			Expectancy	Progress	Enjoyment	Support	Value	External motivation	Demand	Facilitation
Expectancy	12.48	13%								
Progress	7.20	8%	.49							
Enjoyment	5.81	6%	.26	.26						
Support	5.15	5%	.23	.29	.01					
Value	5.09	5%	.16	.16	.15	.22				
External Motivation	4.71	5%	-.19	-.12	-.29	.07	-.15			
Demand	4.27	4%	-.29	-.24	-.11	.03	.12	.17		
Facilitation	3.75	4%	.17	.10	.06	.16	.32	.14	.18	
Commitment	3.22	3%	.21	.30	.10	.22	.27	-.02	.05	.26

Note. The term “SS loadings” refers to the sum of squared loadings for each factor. The term “Proportion Var” refers to the proportion of total item variability that is accounted for by the factor. Goal dimensions are sorted in descending order of explained variance.

It is important to note that the goal external motivation dimension is not the opposite of internal motivation, instead, both motivations can coexist and jointly influence outcomes (Ryan & Deci, 2020). Moreover, the goal enjoyment dimension is related to intrinsic motivation, but is not identical, as it includes both a motivational reason and effective experiences during goal pursuit. To avoid jingle and jangle fallacies, we refer to this factor as goal enjoyment.

Goal expectancy explained 13% of overall variance, followed by goal progress (8%), followed by goal enjoyment (6%). Together, these dimensions accounted for about half of the variance that could be explained by the entire Goal Dimensions Questionnaire (52%). Given their capacity to explain a large proportion of the variability of commonly used goal dimension measures, the goal expectancy, progress, and enjoyment dimensions may be necessary for comprehensive goal measurement.

As the factor-analytical approach relies on empirical associations between items, the resulting goal dimensions may differ from previous conceptualizations. For example, the goal commitment scale includes effort, which is not consistently an aspect of goal commitment but an important indicator of it (see Klein et al., 2013). Nevertheless, most intercorrelations of factors align with theoretical considerations and expectations. For example, the correlation between goal progress and expectancy may indicate that people base evaluations of their goals' expectancy on their goal progress (Harkin et al., 2016). Moreover, the correlation between goal value and facilitation may suggest that people have auxiliary goals for goals that they highly value (Riediger & Freund, 2004).

All loadings of selected items are listed in Table 2.

Table 2

Standardized Loadings of Selected Items for Goal Dimension Factors (Study 1)

Items	Factors								
	Expectancy	Progress	Enjoyment	Support	Value	External motivation	Demand	Facilitation	Commitment
How confident are you that you will reach your goal “<keyword>”?	**.88**	-.02	.06	.02	-.02	.06	-.04	-.02	.00
How capable are you of accomplishing your goal “<keyword>”?	**.82**	-.01	-.02	-.02	-.01	-.13	-.01	.01	-.05
How likely is it that your goal “<keyword>” will be achieved?	**.81**	.10	.06	-.02	.08	.15	.01	-.03	-.03
How successful have you been with your goal “<keyword>” so far?	.03	**.84**	.06	-.01	-.04	-.05	-.02	.00	.02
Relative to your expectations, how much progress have you made with your goal “<keyword>” so far?	-.02	**.81**	.02	.06	.01	.06	-.04	-.01	.01
How satisfied are you with your progress towards your goal “<keyword>”?	.01	**.72**	.12	.02	.03	.05	-.11	.05	.09
To what extent are you pursuing your goal “<keyword>” because of the enjoyment it provides to you?	.08	.04	**.80**	-.01	.05	.04	-.06	-.01	.03
How much do you enjoy working on your goal “<keyword>”?	.06	.19	**.73**	-.01	.08	.03	-.10	0	.01
How happy do you feel while thinking about your goal “<keyword>”?	.17	.06	**.46**	.04	.20	-.14	-.13	.05	.08
To what extent do those close to you know that you pursue your goal “<keyword>”?	.06	.02	.07	**.86**	-.03	-.02	.06	-.07	.01
To what extent do people who are close to you see your goal “<keyword>” as important?	-.07	.01	-.11	**.83**	.11	.06	-.06	.10	-.06
To what extent do you feel your goal “<keyword>” is supported by other people? Support may come in different forms - e.g. emotional, financial or practical.	.02	.01	.02	**.71**	.00	.04	-.11	.01	.00
How much do you care about achieving your goal “<keyword>”?	.07	-.03	-.01	-.01	**.75**	.00	.09	-.01	.04
How valuable is your goal “<keyword>” to you?	.02	-.02	.08	.04	**.64**	.05	.02	.17	-.01
Relative to your other goals, how important is your goal “<keyword>” to you?	.01	.06	-.06	.14	**.51**	.03	.00	.19	.13
To what extent are you pursuing your goal “<keyword>” because someone else wants you to?	.00	-.05	-.07	.13	-.05	**.61**	-.02	.05	-.11
To what extent do you feel that it was your decision to take on your goal “<keyword>”?	-.04	-.01	.13	-.09	.13	**-.62**	.02	.07	.08
To what extent are you pursuing your goal “<keyword>” because you will get something from somebody if you do?	.08	.03	.11	.07	-.01	**.60**	.06	.07	-.16
How demanding do you find your goal “<keyword>”?	.03	.05	-.01	.01	.03	-.09	**.75**	.00	.05
How challenging do you find your goal “<keyword>”?	-.11	.07	-.03	.08	.12	-.08	**.70**	-.03	-.06

Table 2

Standardized Loadings of Selected Items for Goal Dimension Factors (Study 1)

Items	Factors								
	Expectancy	Progress	Enjoyment	Support	Value	External motivation	Demand	Facilitation	Commitment
How exhausting is it for you to carry out your goal “<keyword>”?	.04	.00	.09	-.06	-.07	.11	**.68**	.13	.01
To what extent does pursuing your goal “<keyword>” also benefit the pursuit of your other goals?	.05	.03	-.04	-.09	-.02	-.04	-.02	**.83**	-.05
To what extent does the pursuit of other goals help the pursuit of your goal “<keyword>”?	-.02	.06	-.01	.04	.13	.05	.14	**.63**	-.04
How helpful is being successful in your goal “<keyword>” for your other goals?	-.06	.11	.10	.08	-.01	.06	.00	**.70**	-.09
How hard are you trying to pursue your goal “<keyword>”?	-.07	**.32**	.02	.14	**.34**	.08	.00	-.02	**.46**
How committed are you to your goal “<keyword>”?	.25	.09	.12	.06	**.42**	.05	-.01	-.02	**.38**
How much effort have you put into your goal “<keyword>”?	-.15	**.48**	.09	.12	.18	.05	.11	.01	**.36**

Note. Item loadings that are above .30 are printed in bold. The term “<keyword>” was replaced by a participant-chosen keyword for their goal

The means, standard deviations, and correlations of goal dimension scales from the selected items are represented in Table 3.

Table 3

Means, Standard Deviations, and Correlations of Selected Items for Goal Dimension Scales (Study 1)

Goal Dimension	M	SD	Expectancy	Progress	Enjoyment	Support	Value	External motivation	Demand	Facilitation
Expectancy	5.67	1.04								
Progress	4.53	1.36	.49***							
Enjoyment	4.87	1.51	.44***	.45***						
Support	5.03	1.50	.22***	.30***	.13*					
Value	6.23	0.80	.19**	.21***	.25***	.30***				
External Motivation	4.29	0.60	.34***	.19**	.16**	.27***	.16**			
Demand	5.48	1.07	-.22***	-.19**	-.14*	.02	.17**	.14*		
Facilitation	4.77	1.38	.14*	.14*	.14*	.18**	.42***	.28***	.22***	
Commitment	5.68	1.00	.34***	.57***	.39***	.40***	.57***	.32***	.08	.31***

Note. Goal dimensions are sorted in descending order of explained variance.

Most goal dimension items had good to excellent factor loadings. Two items that we found to measure commitment had relatively low loadings on the respective factor and loaded comparatively high or somewhat higher on the value and progress factors. However, the item wordings were more consistent with the factor representing goal commitment, that is, actively striving for a goal and being dedicated (Klein et al., 2013). For example, the item “How much effort have you put into your goal “<keyword>”?” is meant to evaluate how hard and consistently someone strives towards a goal, whereas the goal progress factor is indicated by evaluations of current advancement. Similarly, the items selected to measure goal commitment showed cross-loadings on the goal value factor but aligned more with goal commitment than with goal value, which indicates personal significance and care. Nevertheless, the observed overlap suggests that future research could consider a higher-order or composite construct of goal importance, encompassing both goal commitment and value, even though this requires further validation. In addition, exploratory factor analysis sequentially extracts factors that only account for a decreasing share of the total variance, resulting in lower item loadings on latter factors (Costello & Osborne, 2005). The confirmatory factor analysis in Study 2 accounts for this bias.

The Goal Dimensions Questionnaire

The extracted subscales are listed in Table 4 and are consistent with well-established concepts and theories already discussed in goal research. This is in line with our focus on common goal dimensions, as using common measures for factor analysis is likely to result in common concepts.

Table 4

Subscales of the Goal Dimensions Questionnaire

Goal dimension	Description and Item Meaning	Items	Response scale (0 - 6)	Exemplary item source
Expectancy	Extent to which the goal seems attainable. People high in expectancy consider themselves as confident, capable, and likely to attain their goal. The items indicate the degree of confidence in one's ability to accomplish a goal.	How confident are you that you will reach your goal "<keyword>"?	not at all confident - very confident	Segerstrom & Solberg Nes, 2006
		How capable are you of accomplishing your goal "<keyword>"?	not at all capable - very capable	Emmons, 1986
		How likely is it that your goal "<keyword>" will be achieved?	not at all likely - very likely	Flunger et al., 2016
Progress	Extent to which pursuing the goal has, so far, been successful People high in progress have accomplished much relative to their expectations, and are successful as well as satisfied with the current progress. The items indicate one's evaluation of achievement so far.	Relative to your expectations, how much progress have you made with your goal "<keyword>" so far?	no progress at all - a great deal of progress	Dowden, 2004
		How successful have you been with your goal "<keyword>" so far?	not at all successful - very successful	Sweeny & Dunlop, 2020
		How satisfied are you with your progress towards goal "<keyword>?"	not at all satisfied - very satisfied	Yamaguchi & Halberstadt, 2012
Enjoyment	Extent to which the pursuit of the goal is experienced as enjoyable People high in enjoyment feel happy thinking about a respective goal, enjoy working on it, and pursue it because of the enjoyment it brings.	How much do you enjoy working on your goal "<keyword>"?	do not enjoy it at all – enjoy it very much	Little, 1983
		To what extent are you pursuing your goal "<keyword>" because of the enjoyment it provides to you?	not at all for this reason - entirely for this reason	McClure & Lydon, 2018

Table 4

Subscales of the Goal Dimensions Questionnaire

Goal dimension	Description and Item Meaning	Items	Response scale (0 - 6)	Exemplary item source
	The items indicate the satisfaction and pleasure one gets from a goal.	How happy do you feel while thinking about your goal "<keyword>?"	not happy at all - very happy	Helgeson & Takeda, 2009
Support	Extent to which close others acknowledge the goal and support its pursuit	To what extent do those close to you know that you pursue your goal "<keyword>"?	do not know at all - know completely	Little, 1983
	People high in support evaluate themselves as backed by those close to them, who are aware of their goal and consider it important.	To what extent do you feel your goal "<keyword>" is supported by other people? Support may come in different forms - e.g. emotional, financial, or practical.	not at all supported - very much supported	Vilhena-Churchill, 2005
	The items indicate the help and encouragement people receive from others in their goal pursuit.	To what extent do people who are close to you see your goal "<keyword>" as important?	not at all - very much	Blunt & Pychyl, 2000
Value	Extent to which the goal is personally valued and cared about.	How much do you care about achieving your goal "<keyword>"?	do not care at all - care a great deal	Nenkov & Gollwitzer, 2012
	People high in value care about goal attainment, evaluate the goal as highly valuable and important.	How valuable is your goal "<keyword>" to you?	not at all valuable - very valuable	Karoly & Lecci, 1997
	The items indicate the importance and desirability of one's goal.	Relative to your other goals, how important is your goal "<keyword>" to you?	not at all important - very important	Rafaeli-Mor, 2002

Table 4

Subscales of the Goal Dimensions Questionnaire

Goal dimension	Description and Item Meaning	Items	Response scale (0 - 6)	Exemplary item source
External Motivation	Extent to which the goal is pursued because others want to or expect it from the goal pursuer	To what extent are you pursuing your goal “<keyword>” because someone else wants you to?	not at all for this reason - entirely for this reason	Sheldon & Kasser, 1995
	People high in external motivation pursue a goal because it is desired by someone else and they get a reward for it, without feeling that they have personally chosen that goal.	To what extent do you feel that it was your decision to take on your goal “<keyword>?” (R)	not at all valuable - very valuable	McGregor & Little, 1998
		To what extent are you pursuing your goal “<keyword>” because you will get something from somebody if you do?	not at all important - very important	Moore et al., 2020
	The items indicate how strongly one’s goal pursuit is determined by external sources.			
Demand	Extent to which pursuing the goal is experienced as challenging and stressful.	How demanding do you find your goal “<keyword>”?	not at all demanding - very demanding	Salmela-Aro & Suikkari, 2008
	People high in demand evaluate their goal as challenging, exhausting, and demanding.	How challenging do you find your goal “<keyword>?”	not at all challenging - very challenging	McGregor & Little, 1998
	The items indicate the difficulty and strain experienced during goal pursuit.	How exhausting is it for you to carry out your goal “<keyword>?”	not at all exhausting - very exhausting	Callahan Churchill, 2005
Facilitation	Extent to which pursuing the goal simultaneously facilitates other goals.	To what extent does pursuing your goal “<keyword>” also benefit the pursuit of your other goals?	does not benefit them at all - benefits them a lot	Anaby et al., 2010
	People high in facilitation have a well-integrated system of interconnected goals, where pursuing and succeeding in	To what extent does the pursuit of other goals help the pursuit of your goal “<keyword>?”	does not help at all - helps a lot	Namadian, 2016

Table 4

Subscales of the Goal Dimensions Questionnaire

Goal dimension	Description and Item Meaning	Items	Response scale (0 - 6)	Exemplary item source
	the respective goal benefits other goals, and vice versa. The items indicate the degree of synergy between one's goal and other goals.	How helpful is being successful in your goal "<keyword>" for your other goals?	not at all helpful - very helpful	Christiansen et al., 1999
Commitment	Extent to which the person is committed and willing and investing effort into the goal.	How hard are you trying to pursue your goal "<keyword>"?	not trying hard at all - trying very hard	Thomas & Schnitker, 2017
	People high in commitment try hard to pursue their goal, put much effort into it and evaluate themselves as committed.	How committed are you to your goal "<keyword>?"	not at all committed - very committed	Sheldon & Elliot, 2000
	The items indicate the extent to which someone is actively striving for goal attainment.	How much effort have you put into your goal "<keyword>?"	no effort at all – a great deal of effort	Zhang et al., 2018

Note. Goal dimensions are listed order of factor extraction. Three items measured each goal dimension. The term "<keyword>" was replaced by a participant-chosen keyword for their goal, e.g., "marathon" for the goal to run a marathon in the summer. Exemplary item sources list articles where an original form of the item was previously used.

The resulting goal dimensions are composed of items derived from different original goal dimensions. For example, the items for the goal expectancy dimension were previously used to measure goal dimensions that the original authors described as assessing confidence ("How confident are you that you will reach this goal?", Bosnjak, 2016), capability ("How capable are you of accomplishing this goal?", Dark-Freudeman & West, 2016), and likelihood ("How likely is it that this goal will be achieved?", Bolkan, 2006).

Reliability estimates of the goal dimension scales are depicted in Table 5 and show fair to good internal consistency, which is appropriate considering the broad range of personal goals and goal dimensions.

Table 5

Descriptives and Reliability Estimates of the Goal Dimensions Questionnaire Subscales (Study 1)

Goal Dimension	*M*	*Mdn*	*SD*	Kurtosis	Skewness	α	ω
Expectancy	4.67	5.00	1.04	1.13	-0.92	.88	.88
Progress	3.53	4.00	1.36	-0.14	-0.54	.89	.89
Enjoyment	3.87	4.00	1.51	-0.51	-0.60	.85	.86
Support	4.03	4.33	1.50	0.11	-0.82	.83	.83
Value	5.25	5.33	0.73	1.03	-1.07	.74	.75
External Motivation	2.61	2.33	0.83	1.28	0.99	.72	.73
Demand	4.48	4.67	1.07	0.52	-0.77	.75	.78
Facilitation	3.77	4.00	1.38	-0.18	-0.56	.79	.78
Commitment	4.68	4.67	1.00	0.20	-0.67	.82	.83

Note. Reliability estimates refer to the goal dimension scales with the three selected items from exploratory factor analysis.

Note that the distributions of goal dimensions are acceptably (goal value) or moderately

(all other dimensions) skewed (George & Mallery, 2010; Hair et al., 2022). All goal dimension distributions are left-skewed, except for the external motivation dimension, which is right-skewed. We assume that people generally have personal goals that they value, are committed to, or have social support for, which explains the skewed goal dimension scales. We expect lower skewness when people evaluate a larger number of goals (e.g., as in personal project analysis, Little, 1983) and consider the relative positioning of their goals to each other.

In sum, the exploratory factor analysis with nine correlated factors had acceptable fit to the data, the internal consistency of the goal dimension scales was appropriate, and the resulting goal dimensions were interpretable in accordance with existing concepts and theories. In the subsequent studies, we provide further evidence for the construct validity of the GDQ.

Study 2: Confirmatory Factor Analysis

In Study 2, we aimed to produce further estimates for the GDQ's structural validity and reliability (Brown & Moore, 2012; Flake et al., 2017). This was done through confirmatory factor analysis, which is often used to validate the structure of a measurement model by testing the fit between a hypothesized measure model and the observed data (Alavi et al., 2023; DiStefano & Hess, 2005).

Method

We used the same participant recruitment platform (www.prolific.com), inclusion and exclusion criteria, and cutoffs to describe item loadings as in Study 1 (Comrey & Lee, 1992). In addition, participants who had participated in Study 1 were ineligible. From the original 303 participants, we excluded 43 participants based on two attention checks and two participants with a relative speed index greater than two, resulting in in N = 258 participants. Participants received £1,13 for participation, were on average M = 31.5 years old (SD = 11.1), 186 (72%) of them were female, 70 of them were male, and 2 of them did not provide gender information.

We performed the confirmatory factor analysis using the "cfa" function from the lavaan-

package (Rosseel, 2012) in R (R Core Team, 2020). Parameters were estimated using maximum likelihood estimation.

Participants' goals were again classified by a research assistant as belonging to the following domains (Oscarsson et al., 2020): work and studies (30%), weight loss (12%), physical health (13%), self-improvement (16%), finances (5%), mental health and sleep (5%), friends and family (2%), home environment (6%), hobbies and interests (2%), eating habits (1%), love (1%), and tobacco habits (1%).

Results and Discussion

The standardized loadings of the latent variables in the measurement model are presented in Table 6, along with reliability estimates that ranged from acceptable to good.

Table 6

Standardized Item Loadings from Confirmatory Factor Analysis for Latent Goal Dimensions (study 2)

Items	Item Loading	Goal Dimension	α	ω
How confident are you that you will reach your goal “<keyword>”?	.92			
How capable are you of accomplishing your goal “<keyword>”?	.65	Expectancy	.85	.86
How likely is it that your goal “<keyword>” will be achieved?	.87			
How successful have you been with your goal “<keyword>” so far?	.86			
Relative to your expectations, how much progress have you made with your goal “<keyword>” so far?	.82	Progress	.88	.88
How satisfied are you with your progress towards your goal “<keyword>”?	.85			
To what extent are you pursuing your goal “<keyword>” because of the enjoyment it provides to you?	.74			
How much do you enjoy working on your goal “<keyword>”?	.91	Enjoyment	.82	.83
How happy do you feel while thinking about your goal “<keyword>”?	.70			
To what extent do those close to you know that you pursue your goal “<keyword>”?	.71			
To what extent do people who are close to you see your goal “<keyword>” as important?	.70	Support	.68	.69
To what extent do you feel your goal “<keyword>” is supported by other people? Support may come in different forms - e.g. emotional, financial or practical.	.56			
How much do you care about achieving your goal “<keyword>”?	.74			
How valuable is your goal “<keyword>” to you?	.75	Value	.80	.80
Relative to your other goals, how important is your goal “<keyword>” to you?	.77			
To what extent are you pursuing your goal “<keyword>” because someone else wants you to?	.83			
To what extent do you feel that it was your decision to take on your goal “<keyword>”?	-.66	External Motivation	.66	.70
To what extent are you pursuing your goal “<keyword>” because you will get something from somebody if you do?	.43			
How demanding do you find your goal “<keyword>”?	.66			
How challenging do you find your goal “<keyword>”?	.83	Demand	.78	.78
How exhausting is it for you to carry out your goal “<keyword>”?	.43			
To what extent does pursuing your goal “<keyword>” also benefit the pursuit of your other goals?	.85			
To what extent does the pursuit of other goals help the pursuit of your goal “<keyword>”?	.52	Facilitation	.73	.75
How helpful is being successful in your goal “<keyword>” for your other goals?	.75			
How hard are you trying to pursue your goal “<keyword>”?	.81			
How committed are you to your goal “<keyword>”?	.79	Commitment	.82	.82
How much effort have you put into your goal “<keyword>”?	.75			

Note. The term “<keyword>” was replaced by a participant-chosen keyword for their goal.

Items with low loadings on the goal commitment dimension in Study 1 had high loadings on their latent variable in this study. One item loading for the external motivation dimension is only fair. However, the item meaning is consistent with the interpretation of the factor, indicating that the low item loading reflects the breadth of the underlying construct and supporting our approach of measuring goal dimensions with three items (Sheldon & Elliot, 1998).

The correlations of the goal dimensions are shown in Table 7:

Table 7

Correlations of Goal Dimensions (Study 2)

	Expectancy	Progress	Enjoyment	Support	Value	External motivation	Demand	Facilitation
Expectancy								
Progress	.43***							
Enjoyment	.49***	.44***						
Support	.23**	.26***	.23**					
Value	.26***	.16	.27***	.40***				
External Motivation	-.21*	-.10	-.22**	-.03	-.25**			
Demand	-.31***	-.16	-.19*	.06	.12	.20*		
Facilitation	.09	.07	.14	.27***	.33***	-.02	.17	
Commitment	.45***	.61***	.43***	.37***	.52***	-.13	.03	.13

Our confirmatory factor analysis model again meets two of three model fit index cutoffs with SRMR = .063, RMSEA = .058, and CFI = .92. Thus, the goal dimensions showed good fit according to the SRMR and RMSEA, but narrowly missed the CFI cutoff (Hu & Bentler, 1999). However, the fixed cutoffs proposed by Hu and Bentler (1999) have been criticized as being most appropriate for the specific models from which they were derived (Heene et al., 2011; Marsh et al., 2004). Given the good interpretability of the factors and items, we consider the questionnaire to be adequate overall.

Some goal dimensions, such as goal commitment and progress, are moderately to highly correlated (e.g., $r = .61$). While this reflects empirical overlap, the dimensions are conceptually distinct: goal commitment reflects active goal striving and willingness to exert effort, whereas goal progress captures the implementation and evaluation of that striving (Klein et al., 2013). Methodologically, shared method variance may have inflated correlations, as presenting all items at once may have lead participants to carry related thoughts and evaluations from one response to the next (Podsakoff et al., 2003).

In sum, we find support for the substantive and structural validity of the GDQ (Zumbo, 2009). In a next step, we investigate its external validity by relating scores on the GDQ to other constructs, specifically successful goal pursuit (Study 3) and well-being (Study 4).

Study 3: Predicting Successful Goal Pursuit from Goal Dimensions

In this study, we investigated the predictive validity of the GDQ in the context of academic exams by using its dimensions expectancy, progress, enjoyment, support, value, external motivation, demand, facilitation, and commitment to predict two indicators of successful goal pursuit, namely students' subjective satisfaction with their own performance after an exam and their exam grade. Several theories and studies have proposed that certain goal dimensions should facilitate or hinder successful goal pursuit. Thus, finding associations between the GDQ and measures of successful goal pursuit should provide predictive validity information on the questionnaire (Flora & Flake, 2017). Our aim was not to test existing theories, but to assess

whether the identified goal dimensions align with predictions extrapolated from related, though not identical, constructs. Developed bottom-up, the dimensions likely do not correspond to the specific operationalizations proponents of these theories would use, and which often require distinct designs for proper testing. Thus, our study design is not suited for theory validation.

Predictions

Goal expectancy reflects confidence in one's goal pursuit abilities and goal value reflects the subjective importance, concern, and utility of goal attainment (Bandura, 1982; Eccles & Wigfield, 2002). As such, high levels of goal expectancy and value promote performance-enhancing decisions, like setting ambitious subgoals, which improve the outcomes of goal pursuit. Accordingly, both goal expectancy and value should be positively associated with successful goal pursuit.

Goal progress is necessary for goal attainment (Carver & Scheier, 1998; Locke & Latham, 2002). In addition, experiencing progress provides feedback, such as positive emotions or information about the efficacy of means for goal attainment, that increases motivation to pursue the goal or allows for adjusted pursuit. Conversely, goal demand hinders goal pursuit, especially when it exceeds one’s abilities. Experiencing goal pursuit as highly demanding indicates unresolved obstacles in goal pursuit and arouses negative emotions, like frustration or worry, that decrease motivation (Bagozzi & Pieters, 1998). Accordingly, goal progress should be positively and demand negatively associated with successful goal pursuit.

Goal enjoyment refers to the positive emotions and intrinsic satisfaction that individuals experience in the process of goal pursuit, as described in self-determination and flow theories (Rheinberg & Engeser, 2018; Ryan & Deci, 2000). Individuals with high levels of goal enjoyment are effortlessly engaged and immersed in the process of goal pursuit, indicating reduced awareness of the effort that they are expending and sustained motivation, and thus should be positively associated with successful goal pursuit.

Goal support refers to the emotional backing to persist in goal pursuit and provides both

informal and practical resources to do so (Koestner et al., 2015; Low et al., 2017). In addition, social cognitive theory posits that goal support from close others increases an individual's self-efficacy beliefs, which, in sum, should be positively associated with successful goal pursuit (Bandura, 2001).

Self-determination theory posits that goals that are highly externally motivated, that is, driven by external factors, frustrate the individual's need for autonomy (Sheldon & Elliot, 1999). Frustration of basic needs is associated with a reduction in interest in goal-relevant behavior and should ultimately hinder goal pursuit, and thus success (see also Sheldon & Elliot, 1998).

Goal systems theory posits that facilitation among goals indicates instrumental relations between goals and symbiotic effects, like overlapping goal attainment strategies (Kruglanski et al., 2002). This constellation of goals allows for less effortful pursuit of multiple goals simultaneously, thereby promoting goal attainment (Riediger & Freund, 2004).

According to goal-setting theory, goal commitment means being highly dedicated, persistent, and willing to invest effort to reach a goal (Locke & Latham, 2002; see also Monzani et al., 2015). This binding to a goal is assumed to enhance performance in goal attainment.

In summary, we predicted that the goal expectancy, progress, enjoyment, support, value, facilitation, and commitment goal dimensions are positively associated with successful goal pursuit, and the goal external motivation and demand dimensions are negatively associated with successful goal pursuit.

Method

Participants and procedure

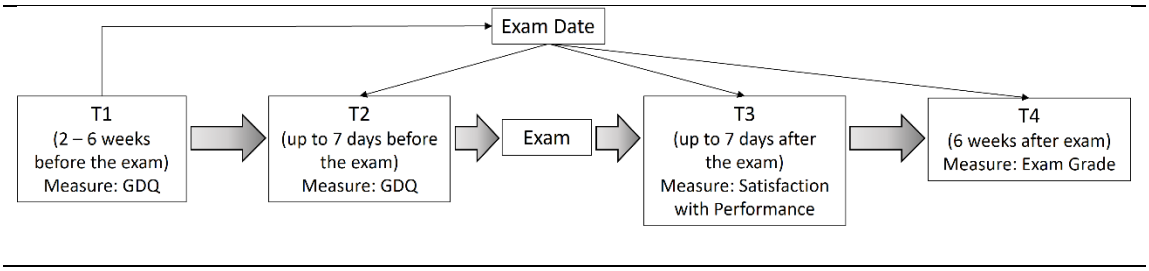
We analyzed data from four measurement occasions of a longitudinal study conducted with two cohorts of students, one at the end of the 2021/22 winter semester (N = 98) and one at the end of the 2022 summer semester (N = 167). We recruited as many participants as possible via a recruitment booth five to three weeks prior to the exam phase, resulting in a pooled N = 265 participants with a mean age of 22.2 years (SD = 3.28). Of these, 201 participants identified

as female and two reported not fitting into these categories. Participants were required to take a graded exam within two to six weeks and were recruited from the Department of Psychology's participant pool and from recruitment booths near two university canteens. Incentives to participate included course credits, snacks, university merchandise, a lottery to win 100€, and personalized feedback after study completion.

Participants who wanted to participate in the study registered on a study website that provided study information, from which they were directed to the survey platform (formR; Arslan et al., 2020), and completed the first questionnaire. The first questionnaire (T1) had to be answered two to six weeks before a self-selected exam (M = 27 days, SD = 6.9 days), the second questionnaire (T2) within seven days before the exam (M = 6.4 days, SD = 1.1 days), the third questionnaire (T3) on the day after the exam (M = 1.9 days, SD = 3.9 days), and the fourth questionnaire (T4) six weeks after the exam (M = 44.3 days, SD = 7.6 days), see also Figure 1. The mean interval between T1 and T2 was 20.8 (SD = 6.7) days. At T1, participants described their academic goal and then responded to the GDQ with regard to that goal (in addition to other brief measures not relevant to the article but reported on the OSF page). At T2, participants again responded to the GDQ regarding their goal. Participants also responded to measures of well-being at both T1 and T2, which are introduced in Study 4. The results of these analyses are presented in Table 17. At T3, participants reported their subjective satisfaction with their performance on the exam. Finally, at T4, participants reported the grade they received. At each measurement occasion, the measures were presented in a randomized order.

Figure 1

Time Course of Questionnaires Measuring Exam Goals



Participants in the winter semester had higher scores on the goal progress dimension (U = 9582, p = .020) and enjoyment (U = 9877, p = .005) at the first measurement time point. However, we pooled participants because all other goal dimension measures did not differ across the semesters.

Inclusion and Exclusion Criteria

Similar to Studies 1 and 2, we excluded participants who failed an attention check (n_{T1} = 7, n_{T2} = 8) and who had an RSI > 2 (n_{T1} = 4, n_{T2} = 5) in the first and second questionnaires. For language proficiency, participants rated their German language skills on a scale from 0 - *very bad* to 6 - *very good* to the question "How good is your knowledge of the German language?". Those who scored less than 5 were excluded (n = 1), resulting in N_{T1} = 265 and N_{T2} = 231.

Goal Dimensions

The GDQ was translated by the authors of this article whose native language is German. They are also highly fluent in English and experts in motivational psychology, goal dimensions, and questionnaire- and item construction. Two German research assistants helped with the back- and forth-translation of the items (available in the online supplement).

The goal prompt was adapted for academic goals, which we referred to as the level of performance that students were aiming for in an upcoming graded university exam (see online supplementary material for exact wording). Examples of goals provided to students were “Get a very good grade in exam X” or “Don’t fail at the exam in subject Y”. In the previous studies, we listed the goal dimensions in the order of factor extraction. However, as we consider all

dimensions to be equally important, we hereafter present them in alphabetical order.

Successful Goal Pursuit

Academic goals referred to individual performance aspirations, so we measured objective and subjective goal attainment and goal progress. Objective goal attainment was measured by asking participants about their received grade with the item “What grade did you receive for the exam of your goal “XYZ” on a 10-point scale from 1 to 4 in increments of 0.3, with “failed” as the extreme anchor (in the German grading system, 1 is very good and 4 is poor but sufficient for passing) in the fourth questionnaire. In the third questionnaire, we measured subjective goal attainment by asking participants “How satisfied are you with your performance on your academic goal “XYZ” (0 = *not satisfied at all*, 6 = *very satisfied*). In addition, we used the goal progress dimension from the GDQ at T2 (before the exam) to indicate success in the process along the way. As the construct validity of the goal progress dimension is uncertain at this stage, results involving this dimension as an outcome are reported only in the online supplement. For a critical study on self-reported goal progress measures, see Smyth et al. (2023).

Preregistration

We preregistered our predictions (OSF; https://osf.io/hsftu). However, the preregistration for this study included predictions about associations between goal dimensions and measures of well-being, which, due to space constraints, we only investigated in Study 4. In the online supplement, we provide correlations of goal dimensions with measures of well-being from Study 3, which are broadly consistent with the results of Study 4. In addition, we planned to explore associations of personality traits and goal dimensions with successful goal pursuit which we have also included in the online supplement. We furthermore preregistered computing models that estimate the effects of goal dimensions on indicators of successful goal pursuit simultaneously. However, the variance in indicators of successful goal pursuit was not sufficient

for large models that included all goal dimension predictors at once. We therefore computed zero-order correlations for each combination of goal dimension and outcome: associations of goal dimensions from both goal dimension measurement points with satisfaction with performance and exam grade (36 correlation models), and two cross-sectional (16 correlation models) and cross-lagged (8 correlation models) associations of goal dimensions with the dimension progress. In addition, we controlled the latter cross-lagged associations for the autoregressive effect of goal progress (8 regression models). This resulted in the large number of 68 models.

We report unadjusted results to account for their unique possible effects. However, because goal dimensions are conceptually and empirically related (see Tables 1 and 6), we also report whether the respective associations fall below a Benjamini-Hochberg (1995) corrected alpha level of statistical significance that accounts for multiple comparisons. The Benjamini-Hochberg correction is based on the Bonferroni correction and modifies the significance threshold for a maximum of 5% false positives in a group of related tests.

In addition to the preregistered predictions, we also explored the unique and common contributions of goal dimensions for predicting successful goal pursuit by using commonality analyses with the “yhat” package in R (Nimon et al., 2008). This analysis partitions the total explained variance (R^2) from a multiple regression into the unique and common contributions of all possible predictors (Nimon & Reio, 2011). For instance, in a regression of Y on A, B, and C, the overall R^2 is partitioned into the unique contributions of A, B, and C, as well as the common contributions of all possible combinations (e.g., A and B, B and C, A and C, and A, B, and C). Negative common contributions reflect suppressor effects, whereby a goal dimension removes irrelevant variance in the others, thereby enhancing the latter’s contribution to the model’s overall R^2 (Nimon & Oswald, 2013).

Results

We did not categorize the goals of this study because all participants were students

pursuing academic goals. Table 8 illustrates the reliability coefficients α, ω, and retest-reliability as calculated by Pearson-correlations of successive goal dimension measures, which were acceptable to good.

Table 8

Reliability Estimates for Goal Dimensions at Both Measurement Time Points (Study 3)

Goal dimension	T1		T2		Retest-Reliability
	α	ω	α	ω	
Commitment	.61	.71	.71	.77	.65***
Demand	.80	.82	.75	.81	.63***
Enjoyment	.75	.77	.83	.84	.72***
Expectancy	.81	.82	.85	.86	.58***
External Motivation	.61	.63	.66	.71	.71***
Facilitation	.63	.66	.64	.68	.65***
Progress	.82	.84	.87	.88	.48***
Support	.65	.67	.64	.66	.68***
Value	.75	.76	.85	.85	.67***

The cross-sectional associations of the goal dimensions with each other and their cross-lagged associations with satisfaction with performance and exam grade are shown in Table 9.

At both T1 and T2, goal enjoyment, expectancy, and progress were positively and goal demand negatively associated with subjective satisfaction with exam performance at T3 and with objective exam grade reported at T4. These results are partially consistent with our predictions.

Table 9

Means, Standard Deviations, and Correlations of Goal Dimensions and Measures of Successful Goal Pursuit. Values Below the Diagonal Refer to Correlations at T1. Values Above the Diagonal Refer to Correlations at T2. Significant Results ($p < .05$) in Line with Our Predictions are Printed in Bold (Study 3).

Variable	M_{T1}	SD_{T1}	M_{T2}	SD_{T2}	Com	Dem	Enj	Exp	Ext	Fac	Pro	Sup	Val	Sat	Gra
1. Com	4.12	1.03	4.16	1.10		.21**	.20**	.45***	.06	.17*	.63***	.39***	.47***	.13	.12
2. Dem	4.20	1.11	4.28	0.99	.31***		-.18**	-.33***	.07	.08	-.14	.31***	.33***	**-.17***	**-.22****
3. Enj	2.63	1.30	2.48	1.39	.14*	-.26***		.44***	-.19**	.26***	.40***	.04	.20**	**.21****	**.20****
4. Exp	4.27	0.88	4.11	1.02	.16*	-.35***	.34***		.06	.23***	.62***	.17*	.20**	**.32*****	**.21****
5. Ext	1.00	1.11	1.17	1.21	.10	.13*	-.21***	-.05		.03	.09	.11	-.06	-.09	-.13
6. Fac	3.89	1.18	3.73	1.19	.20***	.13*	.22***	.18**	.06		.11	.23***	.32***	-.02	-.02
7. Pro	3.19	1.18	3.51	1.30	.47***	-.12*	.39***	.42***	-.05	.17**		.23***	.23***	**.29*****	**.23****
8. Sup	3.48	1.34	3.55	1.31	.34***	.31***	.02	.09	.13*	.31***	.15*		.41***	-.04	-.17*
9. Val	4.71	0.98	4.58	1.04	.40***	.30***	.15*	.03	-.06	.31***	.07	.42***		.04	-.14
10. Sat	4.07	1.65	4.07	1.65	.00	**-.15***	**.20****	**.30*****	-.07	.02	**.20*****	-.03	-.03		.59**
11. Gra	6.38	2.99	6.39	2.99	.13	**-.17***	**.27*****	**.22****	-.10	.01	**.26*****	-.13	-.07	.59**	

Note. M = mean; *SD* = standard deviation. T1 and T2 = measurement time points 1 and 2, respectively. Goal dimensions: Com = Commitment, Dem = Demand, Enj = Enjoyment, Exp = Expectancy, Ext = External motivation, Fac = Facilitation, Pro = Progress, Sup = Support, Val = Value. Successful goal pursuit measures: Sat = Satisfaction with performance, measured at T3, Sat = Satisfaction with success, Gra = Exam grade, with high values representing good grades, measured at T4. * Indicates $p < .05$, ** indicates $p < .01$, *** indicates $p < .001$. Scale range: 0-6. Framed results group predicted associations of goal dimensions with indicators of successful goal pursuit and refer each to a group of tests to which we adapt the alpha level. Bold predicted results are significant at the Benjamini-Hochberg-corrected alpha level (Benjamini & Hochberg, 1995).

The results of the commonality analyses are displayed in Table 10. Goal expectancy made the largest unique contribution to overall R^2 in explaining variance in satisfaction with performance at both time points (T1: 34.9%, T2: 13.9%), and accounted for a total of 75.2% at T1 and 66.2% at T2. For exam grade, goal enjoyment made the largest unique contribution at T1 (11.1%), whereas goal value explained the largest unique variance at T2 (17.9%). Across both outcomes, commonality analysis revealed that the goal dimensions significantly associated with successful goal pursuit in bivariate correlations - i.e., goal demand, enjoyment, expectancy, and progress - largely shared their explanatory power with other dimensions. The common contributions of goal dimensions occasionally differed between outcomes and time points. For example, the common contribution of goal demand, expectancy, and progress on the overall R^2 in predicting satisfaction with performance at T1 was 3.9% and 10.9% at T2, while their common contribution on exam grade was 1.6% at T1 and 4.4% at T2. See the online supplement for a detailed breakdown of shared variance contributions across goal dimensions.

Table 10

Contributions of Goal Dimensions on Predicting Successful Goal Pursuit (Study 3).

A – Measurement Time Point 1

Goal dimension	Contribution to explain satisfaction with performance (overall R^2 = .12)			Contribution to explain exam grade (overall R^2 = .15)		
	Unique	Common	Total	Unique	Common	Total
Commitment	3.6%	-3.6%	0.0%	6.7%	4.7%	11.5%
Demand	0.4%	18.7%	19.1%	1.1%	17.5%	18.6%
Enjoyment	5.7%	29.7%	35.4%	11.1%	37.0%	48.1%
Expectancy	34.9%	40.3%	75.2%	5.9%	27.4%	33.4%
External Motivation	0.5%	3.2%	3.7	1.5%	5.6%	7.1%
Facilitation	0.3%	0.2%	0.5%	0.1%	0.1%	0.1%
Progress	8.3%	27.1%	35.4%	2.8%	41.2%	44.0%
Support	0.4%	0.5%	0.9%	7.3%	4.6%	11.9%
Value	0.8%	0.0%	0.9%	7.8%	-4.2%	3.6%

B – Measurement Time Point 2

Goal dimension	Contribution to explain satisfaction with performance (overall R^2 = .15)			Contribution to explain exam grade (overall R^2 = .17)		
	Unique	Common	Total	Unique	Common	Total
Commitment	0.0%	12.3%	12.3%	6.8%	0.4%	7.1%
Demand	0.7%	20.8%	21.5%	1.4%	25.6%	26.9%
Enjoyment	0.5%	25.9%	26.4%	3.2%	21.0%	24.3%
Expectancy	13.9%	52.3%	66.2%	0.9%	23.4%	24.3%
External Motivation	7.5%	-1.1%	6.5%	7.3%	2.6%	9.9%
Facilitation	4.2%	-3.9%	0.3%	0.0%	0.3%	0.3%
Progress	9.9%	47.4%	57.2%	5.8%	26.3%	32.1%
Support	1.9%	-0.6%	1.3%	9.8%	9.4%	19.1%
Value	0.0%	1.1%	1.1%	17.9%	-6.3%	11.6%

Note. Contributions refer to commonality coefficients, which are shares of the explained variance (R^2) of a dependent variable by multiple predictors in a multivariate linear regression model (Nimon et al., 2008; Nimon & Oswald, 2013). Unique contributions refer to the variance in a dependent variable that is exclusively explained by a goal dimension. Common contributions refer to the variance in a dependent variable that is explained by all possible combinations of goal dimensions that include a specific dimension. The total contributions refer to the sum of the unique and common contributions. Negative common contributions indicate suppression effects of a goal dimension.

Discussion

In Study 3, we predicted successful academic goal pursuit related to an upcoming exam, as indicated by satisfaction with one's performance and actual exam grade from the dimensions of the GDQ assessed on two occasions, prior to the exam. The goal progress, expectancy, and enjoyment dimensions were consistently and positively correlated with indicators of successful goal pursuit, whereas goal demand was negatively correlated. These results are consistent with previous research and provide evidence for the construct and predictive validity of the GDQ. We conclude that goal expectancy, enjoyment, demand, and progress most consistently predict goal attainment in self-selected academic goals. Goal commitment, external motivation, facilitation, support, and value may be related to successful goal pursuit in study contexts that are more tailored to their influence.

Commonality analyses showed a substantial overlap in the predictive power of goal dimensions, as reflected in their common contributions to explained variance in measures of successful goal pursuit. Although these dimensions capture distinct constructs, their predictive effects often run in parallel. For example, if goal expectancy, enjoyment, and progress each positively predict exam grades, they are likely to account for overlapping portions of outcome variance. This shared variance may reflect empirical associations among goal dimensions, even if they operate through different mechanisms.

Researchers aiming to predict successful goal pursuit parsimoniously may prioritize goal dimensions that account for large unique variance, such as expectancy. Additionally, they may select only one goal dimension from a set of goal dimensions that largely overlap in explanatory

contribution. However, the balance of unique and shared contributions occasionally varied across outcomes and time points, such that selecting goal dimensions for concise yet predictive instruments should be guided by pilot studies that evaluate their explanatory power in context.

Study 4 – Well-Being

Goals provide meaning and structure to one's life (Little, 2020). The process of pursuing desired outcomes can lead to the achievement of the outcome, can satisfy basic needs, and can be inherently pleasurable, which increases well-being (Brunstein, 1993; Emmons, 1996; Wiese, 2007). Finding associations between the GDQ and measures of well-being provides further evidence for the validity of our questionnaire. In the present study, we used goal dimensions of New Year's resolutions at four measurement points to predict measures of well-being.

Predictions

Goal pursuit is associated with well-being (for reviews of selected goal dimensions, see Hennecke & Brandstätter, 2017; MacLeod, 2012; Wiese, 2007). These effects may be mediated by goal progress if certain goal dimensions affect progress positively and progress, in turns, leads to positive affect (Brunstein, 1993; Carver & Scheier, 1998) and a more positive evaluation of one's life circumstances (Klug & Maier, 2015). They may also be more direct, if the appraisal of a goal as high in commitment, enjoyment, expectancy, facilitation, support, and value elicits positive emotions (Bagozzi & Pieters, 1998). Conversely, pursuing a goal that is high in goal external motivation and demand may elicit negative emotions and be associated with decreased well-being. The predicted direction of the effects of goal dimensions and well-being parallels that of successful goal pursuit in Study 3. Further support for these predictions comes from several theories and studies:

Self-regulation theory posits that individuals continuously compare their current progress towards a goal with their desired progress (Carver & Scheier, 1998). High progress toward a goal generates positive feedback, leading to elation and relief, which may correspond to

increased well-being (see also Klug & Maier, 2015). On the other hand, highly demanding goals may generate negative feedback, leading to anxiety and depressed feelings, which may correspond to reduced well-being.

Control-value theory posits that people who pursue a goal experience emotions in response to goal-related situations and activities (Pekrun, 2006). Pursuing a highly valued goal and enjoying its pursuit corresponds with positive emotions, such as pride and hope, which may increase overall well-being (see also McGregor et al., 2006; Steca et al., 2016).

Self-determination theory posits that the pursuit of goals is associated with innate psychological needs, such as autonomy (Sheldon & Elliot, 1999). The pursuit of externally motivated goals frustrates these needs, which reduces well-being (Deci & Ryan, 2000).

Hope theory posits that people create mental paths to attain a goal. People high in goal expectancy are more confident, decisive, and certain in following such pathways, which reduces ambiguity, increases agentic thinking, and thereby increases well-being (Snyder, 2002, see also Gallagher & Lopez, 2009; Michalak et al., 2004).

Goal systems theory posits that sharing means of goal attainment with another goal corresponds to symbiotic effects and overlapping goal attainment strategies (Kruglanski et al., 2002; Riediger & Freund, 2004). Thus, easier goal pursuit and increased efficacy of facilitative goals may therefore increase well-being (see also Boudreaux & Ozer, 2013).

Social cognitive theory posits that goal pursuit is influenced by close others (Bandura, 2001). High levels of support in goal pursuit can reduce hindering emotions, such as fear of failure, provide emotional assistance, and endorse the worthiness of a goal, leading to increases in well-being (see also Ruehlman & Wolchik, 1988).

Goal setting theory posits that high goal commitment means being determined to pursue a goal, which promotes positive stress and self-esteem (Locke & Latham, 2002). Commitment is also associated with an optimistic view of the goal, which increases well-being (Brunstein, 1993; Brunstein et al., 1999a).

Following these lines of reasoning, we tested the predicted associations of goal dimensions with measures of well-being at the same time as well as one month later. To ensure these associations were not confounded by stable between-person relationships and to attribute changes in well-being to changes in goal dimensions, we tested the predictions on the basis of within-person relationships.

Similar to Study 3, these predictions are plausible extrapolations from relevant theories, not direct tests of them. For example, Carver and Scheier (1998) examine links between goal progress and momentary affect, whereas our affective well-being measure capture experiences over several weeks. Likewise, the longitudinal associations we tested were derived from theory-based expectations but are not grounded in study designs suited for formal theory testing.

Method

Participants and procedure

We analyzed data from four measurement occasions of a longitudinal study that tracked up to two New Year's resolutions per participant from January to April 2022. A part of the data for this study has been previously analyzed for another publication (******). However, this publication focused on different research questions and reports different analyses.

In January, we recruited as many participants as possible through a recruitment booth on a busy street. During this time, participants responded to the GDQ regarding their resolutions, as well as measures of well-being and additional measures not relevant to the article (but reported on the OSF page). From February through April, participants were asked if they were still pursuing their New Year's resolutions and, if so, completed the questionnaires of this study. Participants completed the consecutive questionnaires at evenly spaced intervals of M = 31 (SD = 2.4) days. All measures were presented in a randomized order.

The January questionnaire was completed by 297 participants with a mean age of 33.6 years (SD = 15.7). Of these, 194 were female and one participant did not report their gender. These participants reported and rated one or two New Year's resolutions for January (n = 296

participants, *n* = 484 goals), February (*n* = 223 participants, *n* = 280 goals), March (*n* = 177 participants, *n* = 293 goals), and April (*n* = 157 participants, *n* = 256 goals). Participants who dropped out after January showed lower levels of conscientiousness (*U* = 8483, *p* = .001) and lower goal progress (*U* = 8968, *p* = .04). We employed U-tests to account for non-normally distributed scores on these measures.

A research assistant coded the participants' goals according to the New Year's resolution categories derived by Oscarsson et al. (2020). The categories were as follows: physical health (22%), work and studies (20%), self-improvement (14%), mental health and sleep (12%), hobbies and interests (6%), weight loss (5%), friends and family (5%), eating habits (4%), home environment (3%), consumption (2%), finances (2%), tobacco (2%), engagement (2%), alcohol (2%), and love (1%).

Measures

We measured goal dimensions using the GDQ. Well-being can be measured in different ways (Diener et al., 1999; VanderWeele et al., 2020). A prominent basic distinction refers to cognitive well-being, that is, evaluative judgments of one's life in general or life satisfaction, and affective well-being, that is, the frequent experience of positive and the rare experience of negative affect (Diener et al., 2003).

Life Satisfaction. We measured life satisfaction using the German version (Schumacher et al., 2003) of the Satisfaction with Life Scale (Diener et al., 1985). The Satisfaction with Life Scale measures global evaluations of one's life on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*), for example with the item "I am satisfied with my life".

Affective Well-Being. We measured affective well-being using the German version (Rahm et al., 2017) of the Scale of Positive and Negative Emotions (Diener et al., 2010), which measures the frequency of six positive and six negative emotions in the past four weeks, such as "pleasant" or "sad", on a scale from 1 (*very rarely or never*) to 5 (*very often or always*). To reduce analytic complexity, we calculated affective well-being as affect balance by subtracting

the sum of negative emotion ratings from the sum of positive emotion ratings (Diener et al., 2010).

Random-Intercept Cross-Lagged Panel Models

We analyzed the data using random intercept cross-lagged panel models (RI-CLPMs), which relate two variables across successive waves in structural equation models (Hamaker et al., 2015). Central aspects of the RI-CLPM are autoregressions, cross-lagged regressions, cross-sectional correlations, and random intercepts. The autoregressive paths control for the influence of past values of a variable on the current value. The cross-sectional paths indicate the relationship between the two variables at the same time. Positive cross-sectional associations indicate that both variables are above their within-person average, and vice versa for negative associations. The cross-lagged paths indicate how strongly one variable at one time predicts the other variable at the next measurement occasion. The random intercepts account for between-person variability, allowing any cross-lagged relationships to be interpreted as reflecting within-person dynamics.

Mulder and Hamaker (2021) provide three prebuilt RI-CLPMs for lavaan (Rosseel, 2012) in R (R Core Team, 2020): a base model without constraints, a model with equality constraints on cross-sectional and lagged effects, and a model with equality constraints on standardized lagged effects. Constraints fix successionally occurring coefficients (i.e., stationarity), allowing for more stable estimators and easier interpretation of results by aggregating detailed information (Mulder & Hamaker, 2021). We used the model with constraints on cross-sectional and lagged effects because we were interested not only in cross-lagged effects, but also in constrained cross-sectional associations. Note that the constraints on cross-sectional correlations do not include the first wave, because the exogenous variables of the first wave are not subject to the same autoregressive and cross-lagged effects as their successors (the initial conditions problem; Wooldridge, 2005). In addition, the RI-CLPMs with constraints on standardized lagged effects are more complex, and compared to the RI-CLPMs with constraints

on cross-sectional and lagged effects, model fit indices were worse or did not improve relative to the indices AIC, BIC, and Chi²-tests (see online supplement). We tested the predictions of this study by computing RI-CLPMs with each of the nine goal dimensions on one side and each of the two well-being measures on the other side, resulting in 18 models. We used two-level RI-CLPMs, with goal dimension scores centered over time and nested in a combined level of goals and persons. As each participant reported only one or two goals, there was insufficient variance at the goal level to model a three-level structure, that is, goal dimensions across time nested in goals, nested in persons. Accordingly, the random intercepts accounted for between-person and between-goal variability simultaneously. Up to two goals per person resulted in 516 goals for models with goal dimensions and affective well-being, and 517 goals for models with life satisfaction. Missing data was managed using full-information maximum likelihood estimation.

As noted above, we aimed to extend the predictions of Study 3 to within-person associations between goal dimensions and successful goal pursuit, as indicated by goal progress. To do this, we computed eight additional RI-CLPMs predicting the goal progress dimension from the remaining goal dimensions, based on 516 goals. The results of these analyses are reported in the General Discussion and the online supplement.

Preregistration

We preregistered our predictions (OSF; https://osf.io/gqy7x). However, the preregistration of this study included RI-CLPMs predicting variables at two measurement points ahead and cross-lagged effects outside of RI-CLPMs, which we did not conduct due to space limitations. For this reason, we report the exploratory associations between personality traits and goal dimensions only in the supplementary material. Furthermore, to increase the number of participants, we extended recruitment from the first two weeks of January (n = 245) until the end of January.

We did not preregister this but adjusted the significance thresholds for tests of between-person correlations involving goal dimensions to account for multiple tests using the Benjamini

and Hochberg (1995) procedure, similar to Study 3. We did not correct the thresholds of the RI-CLPMs because their p-values reflect model-implied relationships that already account for measurement error and temporal dynamics, making further correction overly conservative (Hamaker et al., 2015; Kline, 2023). Additionally, and without having preregistered this, we explored the incremental predictability of goal dimensions using commonality analyses to predict affective well-being and life satisfaction, similar to Study 3.

Results

Table 11 shows that reliability estimates for the goal dimensions range from acceptable to excellent across time points. Between-person omega coefficients are consistently higher than within-person coefficients, indicating that the scales distinguish well between individuals but are less consistent across different goals and time points within individuals.

Table 11
Reliability Information for Goal Dimensions (Study 4)

Goal Dimension	January		February		March		April		Within-Persons	Between-Persons
	α	ω	α	ω	α	ω	α	ω	ω_{WP}	ω_{BP}
Commitment	.66	.69	.76	.78	.78	.80	.78	.79	.69	.76
Demand	.79	.81	.78	.79	.78	.81	.79	.80	.75	.82
Enjoyment	.85	.86	.88	.88	.89	.89	.88	.89	.83	.94
Expectancy	.83	.85	.88	.90	.90	.90	.90	.92	.86	.93
External Motivation	.60	.65	.71	.76	.73	.76	.76	.78	.58	.88
Facilitation	.83	.83	.86	.87	.88	.90	.86	.88	.68	.99
Progress	.91	.91	.93	.93	.93	.93	.93	.93	.90	.98
Support	.65	.68	.70	.74	.74	.78	.72	.74	.59	.82
Value	.83	.83	.88	.88	.85	.86	.87	.87	.80	.94

Note. Reliability parameters for months refer to the average of both goals. For computing the Within-Person and Between-Person Omegas, we pooled the goal and time levels to account for the small number of cases on the goal level. Accordingly, the within-person omegas reflect how consistently a person responds to the items measuring a goal dimension across both, different time points and goals, while the between-person omegas reflect how well the items distinguish between different people.

Table 12 shows the intercorrelations of the study variables at the between-person level and the within-person level. At the within-person level, the time and goal levels were combined. At the between-person level, goal demand, enjoyment, expectancy, external motivation, and progress correlated significantly with both affective well-being and life satisfaction, and goal support correlated with life satisfaction. At the within-person level, goal demand, enjoyment, expectancy, and progress correlated significantly with affective well-being. Goal facilitation, commitment, and value did not correlate significantly with well-being.

Table 12

Between Person and Within Person Correlations of Goal Dimensions and Measures of Well-Being. Values Below the Diagonal Refer to Correlations Within Persons (Across Time and Goals; n = 1409). Values Above the Diagonal Refer to Correlations Between Persons (n = 296). Significant Results (p < .05) in Line With Our Predictions are Printed in Bold (Study 4).

Variable	Commitment	Demand	Enjoyment	Expectancy	External motivation	Facilitation	Progress	Support	Value	Affective well-being	Life satisfaction
Commitment		.40***	.23**	.41***	.12	.31***	.60***	.47***	.63***	-.02	.00
Demand	.13***		-.27***	-.15	.25**	.17*	-.19*	.20**	.35***	**-.32*** **	**-.25** **
Enjoyment	.28***	-.37***		.57***	-.19*	.24***	.56***	.16*	.42***	**.45*** **	**.36*** **
Expectancy	.50***	-.29***	.53***		-.12	.21**	.69***	.41***	.46***	**.36*** **	**.29*** **
External Motivation	.04	.19***	-.28***	-.15***		.07	-.05	.20**	-.18*	**-.19***	**-.20***
Facilitation	.28***	.15***	.10**	.19***	.09**		.27***	.36***	.45***	-.04	.04
Progress	.53***	-.22***	.43***	.58***	-.09**	.17***		.35***	.42***	**.32*** **	**.34*** **
Support	.42***	.18***	.05	.24***	.22***	.26***	.23***		.47***	.11	**.15***
Value	.58***	.14***	.32***	.44***	-.10***	.29***	.30***	.39***		.10	.09
Affective well-being	.02	**-.09***	**.09** **	**.10** **	-.03	.01	**.12*** **	.02	.00		.70***
Life satisfaction	.00	-.06	.06	.07	-.01	.02	.07	.02	-.02	.25***	

Note. M = mean; *SD* = standard deviation. * Indicates *p* < .05, ** indicates *p* < .01, *** indicates p <.001. Framed results group predicted associations of goal dimensions with indicators of successful goal pursuit and refer each to a group of tests to which we adjust the alpha level (Benjamini & Hochberg, 1995). Bold correlation coefficients remain significant after that adjustment.

Random-Intercept Cross-Lagged Panel Models

Cross-lagged effects of goal dimensions with well-being measures in RI-CLPMs reached significance only for the goal support dimension in predicting life satisfaction one month later. Cross-sectionally, goal enjoyment, expectancy, and progress were positively and goal demand negatively associated with affective well-being, and goal enjoyment was additionally associated with life satisfaction (see Table 13 and 14). This means, for example, that if one's goal expectancy at a given measurement occasion is above the personal average across all measurement occasions, it is likely that one's affective well-being will simultaneously also be above one's average.

Table 13

Constrained Cross-Sectional and Cross-Lagged Associations of Goal Dimensions and Affective Well-Being from RI-CLPMs. Each Line Corresponds to a Separate RI-CLPM. Significant Results (p < .05) are Printed in Bold (Study 4).

Goal Dimension	Affective Well-Being (Cross-Sectional)			Affective Well-Being (Cross-Lagged)		
	r	*SE*	*p*	*b*	*SE*	*p*
Commitment	.07	0.24	.198	-.20	.40	.615
Demand	**-.13**	**0.20**	**.010**	.04	.35	.917
Enjoyment	**.14**	**0.21**	**.008**	.42	.35	.222
Expectancy	**.22**	**0.26**	**<.001**	.44	.42	.292
External Motivation	-.09	0.15	.074	-.61	.46	.177
Facilitation	.01	0.20	.916	-.05	.26	.863
Progress	**.20**	**0.30**	**<.001**	.24	.26	.344
Support	.03	0.19	.637	.20	.31	.525
Value	.07	0.21	.241	-.11	.53	.835

Note. *r* = constrained correlation coefficient, *SE* = Standard error, *b* = constrained cross-lagged regression coefficient. The constrained correlations refer to standardized covariances in RI-CLPMs for measurement time points T2 - T4. The constrained cross-lagged regressions refer to measurement time points T1 to T2, T2 to T3, and T3 to T4.

Table 14

Constrained Cross-Sectional and Cross-Lagged Associations of Goal Dimensions and Life Satisfaction from RI-CLPMs. Each Line Corresponds to a Separate RI-CLPM. Significant Results (p < .05) are Printed in Bold (Study 4).

Goal Dimension	Life Satisfaction (Cross-Sectional)			Life Satisfaction (Cross-Lagged)		
	r	*SE*	*p*	*b*	*SE*	*p*
Commitment	.06	0.03	.336	-.01	.04	.892
Demand	-.01	0.02	.912	-.03	.04	.518
Enjoyment	**.13**	**0.02**	**.031**	.06	.04	.137
Expectancy	.03	0.03	.623	.05	.05	.277
External Motivation	.01	0.02	.841	-.02	.05	.682
Facilitation	.08	0.02	.133	.03	.03	.343
Progress	.07	0.03	.267	.04	.03	.267
Support	.06	0.02	.329	**0.07**	**0.03**	**.047**
Value	-.02	0.02	.725	-.02	.06	.772

Note. *r* = constrained correlation coefficient, *SE* = Standard error, *b* = constrained cross-lagged regression coefficient. The constrained correlations refer to standardized covariances in RI-CLPMs for measurement time points T2 - T4. The constrained cross-lagged regressions refer to measurement time points T1 to T2, T2 to T3, and T3 to T4.

Table 15 shows the results of the commonality analyses used in the multiple regression model for predicting affective well-being and life satisfaction by goal dimensions. Goal enjoyment made the largest unique contribution to overall R^2 in explaining variance in both measures of well-being (affective well-being: 23.1%, life satisfaction: 12.3%), and accounted for a total of 69.5% of variance in affective well-being and 50.6% of variance in life satisfaction. Similar to Study 3, the goal dimensions that were significantly associated with well-being in bivariate correlations – namely, demand, enjoyment, expectancy, external motivation, and progress - largely shared their explanatory power with other dimensions. Additionally and similar to Study 3, the common contributions occasionally differed between outcomes. For instance,

enjoyment and expectancy commonly accounted for 8.1% of the overall R^2 in predicting affective well-being, but only 1.7% of variance in predicting life satisfaction. (See the online supplement for a detailed breakdown of shared variance contributions across goal dimensions.)

Table 15

Contributions of Goal Dimensions on Predicting Measures of Well-Being (Study 4).

Goal dimension	Contribution to explain affective well-being (overall R^2 = .23)			Contribution to explain life satisfaction (overall R^2 = .17)		
	Unique	Common	Total	Unique	Common	Total
Commitment	5.9%	-5.9%	0.0%	10.9%	-10.9%	0.0%
Demand	0.2%	24.6%	24.9%	0.0%	22.4%	22.4%
Enjoyment	23.1%	46.5%	69.5%	12.3%	38.4%	50.6%
Expectancy	2.4%	40.2%	42.7%	0.0%	31.2%	31.2%
External Motivation	2.2%	9.2%	11.4%	8.1%	6.1%	14.2%
Facilitation	3.7%	-3.2%	0.4%	0.0%	1.2%	1.2%
Progress	3.5%	28.6%	32.0%	15.4%	27.1%	42.5%
Support	5.3%	-1.0%	4.3%	13.2%	-2.9%	10.3%
Value	0.7%	1.2%	1.9%	2.0%	-0.9%	1.1%

Note. Contributions refer to commonality coefficients, which are shares of the explained variance (R^2) of a dependent variable by multiple predictors in a multivariate linear regression model (Nimon et al., 2008; Nimon & Oswald, 2013). Unique contributions refer to the variance in a dependent variable that is exclusively explained by a goal dimension. Common contributions refer to the variance in a dependent variable that is explained by all possible combinations of goal dimensions that include a specific dimension. The total contributions refer to the sum of the unique and common contributions. Negative common contributions indicate suppression effects of a goal dimension.

Discussion

In this study, we analyzed the associations of goal dimensions with measures of affective well-being and life satisfaction using RI-CLPMs. We expected positive associations of goal commitment, enjoyment, expectancy, facilitation, progress, support, and value dimensions

with both well-being measures and negative associations of goal demand and external motivation with both well-being measures. We found cross-lagged effects of goal support on life satisfaction. Cross-sectionally, goal demand, enjoyment, and progress were correlated with affective well-being, and goal enjoyment was correlated with life satisfaction. Between-person correlations showed associations between the goal demand, enjoyment, expectancy, external motivation, and progress and both affective well-being and life satisfaction. Additionally, goal support correlated with life satisfaction. Within-person correlations showed associations between the goal demand, enjoyment, expectancy, and progress dimensions and affective well-being. We conclude that goal demand, enjoyment, expectancy, and progress most consistently predicted measures of well-being.

We attribute the lack of cross-lagged associations in part to the monthly measurement intervals. A continued effect of within-person change on a goal dimension on measures of well-being after one month may be unlikely. Furthermore, the random intercepts of the RI-CLPMs capture stable between-person variances, and the autoregressive paths control for the effects of a variable on itself over time (Orth et al., 2021). The remaining variance in goal dimensions or affective well-being and life satisfaction may not be sufficient to elicit significant cross-sectional or cross-lagged results, even though underlying relationships may be present. For example, if high levels of external motivation to pursue a goal change little over time, fluctuations in low levels of well-being would not have been detected. Between-person analyses with longer measurement intervals may reveal the predicted cross-lagged effects of goal dimensions.

The lack of expected longitudinal associations raises concerns about the construct validity of the Goal Dimensions Questionnaire, particularly regarding its predictive validity over time. While the questionnaire shows many expected cross-sectional associations, these findings suggest that most goal dimensions may not reflect enduring properties of goal pursuit that influence well-being across one month. This pattern may partially reflect a temporal mismatch, as well-being is often influenced by recent rather than past goal-related experiences (Carver et

al., 1996; Csikszentmihalyi et al., 2005; Diener et al., 1999, 2018). Moreover, it is rare to detect cross-lagged effects in models that control for both between-person and autoregressive within-person effects. Future research may examine whether alternative formulations of goal dimensions, or shorter measurement intervals, yield stronger longitudinal associations

We were unable to compute reliability estimates that separately capture within-person consistency across goals and time due to the limited number of goals per person. However, recent analyses using the same dataset showed that variability in goal dimensions over time was associated with individual differences in personality (Kiendl et al., 2025). Further variance partitioning showed that goal dimensions vary most strongly between goals within a person, with less variability over time and between individuals. The variance analyses were feasible as they estimated variability ratios that tolerate sparse data (Goldstein et al., 2002). However, estimating three-level omega coefficients or fitting multilevel RI-CLPMs requires latent variable models that require more observations per cluster to ensure stable model convergence (Maas & Hox, 2005).

Similar to Study 3, commonality analyses showed that goal dimensions such as goal enjoyment contributed uniquely to predicting well-being, while also sharing explained variance with other predictors. This overlap indicates a similarity in predictability. However, differences in the common contributions between outcomes suggest that the goal dimensions driving these effects are not redundant.

General Discussion

Goal dimensions have often been assessed with ad-hoc measures, single items, and no documentation of reliability and validity (Kiendl & Hennecke, 2022). To improve measurement practices and, thereby, strengthen research on goal dynamics, our aim was to develop a validated questionnaire of commonly measured goal dimensions. In four studies, we provide evidence for the reliability and structural and predictive validity of the GDQ. The goal enjoyment, expectancy, and progress dimensions explained a substantial portion of the variance in

commonly studied goal dimensions and emerged as the most consistent predictors of successful goal pursuit and well-being. Therefore, they seem essential for a comprehensive measurement of personal goals.

Structural Validity of the Goal Dimensions Questionnaire

In Studies 1 and 2, we used factor analyses to identify nine major dimensions that characterize personal goals, the GDQ dimensions: commitment, demand, enjoyment, expectancy, external motivation, facilitation, progress, support, and value. Following recommended practice, relevant and representative items from the literature were pre-selected for an exploratory factor analysis followed by confirmatory factor analysis on the final set of items. Reliability estimates of the goal dimension scales varied across the four studies and measurement time points and ranged from acceptable to excellent. Together, these analyses support the structural validity of the GDQ. The final GDQ contains three items per goal dimension, balancing brevity and comprehensiveness. As such, the GDQ is a well-suited measure to capture differences in goal dimensions, providing reliable information while keeping participant burden at a reasonable level.

Predictive Validity of the Goal Dimensions Questionnaire

In Studies 3 and 4, we further provided information on construct validity by reporting cross-sectional and cross-lagged associations with measures of successful goal pursuit and well-being. We conducted tests of between and within-person predictions. Associations of goal dimensions with successful goal pursuit were partially consistent with our predictions (see Table 16). Goal enjoyment, expectancy, progress, and demand were most consistently related to between-person differences in goal attainment (satisfaction with exam performance and exam grade).

Table 16

Summary of the Associations Between Goal Dimensions and Measures of Successful Goal Pursuit

	Goal dimensions at T1		Goal dimensions at T2	
Goal Dimensions	Satisfaction with Performance	Exam Grade	Satisfaction with Performance	Exam Grade
Commitment				
Demand	−	−	−	−
Enjoyment	+	+	+	+
Expectancy	+	+	+	+
External Motivation Facilitation				
Progress	+	+	+	+
Support				
Value				

Note. + = Positive association, − = Negative association. We adjusted the significance thresholds per group of the nine goal dimensions due to their relatedness, as shown in their intercorrelations (Benjamini & Hochberg, 1995).

A summary of the associations of goal dimensions with measures of well-being is presented in Table 17. Regarding within-person cross-lagged effects of RI-CLPMs, only support predicted well-being, particularly life satisfaction, one month later. Cross-sectionally, more within-person associations emerged as significant: Goal demand, enjoyment, expectancy, and progress were associated with affective well-being, and goal enjoyment was associated with life satisfaction. Overall, goal demand, enjoyment, expectancy, and progress showed the most consistent positive associations of goal dimensions with successful goal pursuit and well-being.

Table 17

Summary of the Associations Between Goal Dimensions and Measures of Well-Being

Goal Dimensions	Study 4								Study 3			
	Within-Persons Cross-Sectional		Within-Persons Cross-Lagged		Between-Persons Aggregated		Between-Persons Unaggregated		Between-Persons T1		Between-Persons T2	
	AWB	LS	AWB	LS	AWB	LS	AWB	LS	AWB	LS	AWB	LS
Commitment												
Demand	−				−	−	−	−	−		−	
Enjoyment	+	+			+	+	+	+	+	+	+	+
Expectancy	+				+	+	+	+	+	+	+	+
External Motivation					−	−	−	−				−
Facilitation									+			
Progress	+				+	+	+	+	+	+	+	+
Support				+		+		+		+		
Value												

Note. + = Positive association, - = Negative association, AWB = Affective Well-Being, LS = Life satisfaction, Within-Persons = Analyses stemming from Random-Intercept Cross-Lagged Panel Models. Between-Persons Aggregated = Correlations referring to aggregated data across measurement time points. Between-Persons unaggregated = Correlations referring to data of multiple measurement time points without aggregation. We adjusted the significance thresholds of between-person analyses per group of the nine goal dimensions due to their relatedness, as shown in their intercorrelations (Benjamini & Hochberg, 1995). We did not adjust the significance thresholds of within-person analyses because their cross-sectional and cross-lagged relations are robust by being aggregated across time points.

Commonality analyses across studies revealed that goal dimensions made unique and shared contributions to the prediction of important outcomes such as successful goal pursuit and well-being. Shared predictive variance, especially among goal expectancy, enjoyment, and progress, likely reflects their tendency to co-occur in individuals pursuing goals successfully. However, the pattern of unique and shared contributions varied by outcome, highlighting the distinctiveness of each dimension and the diverse, yet converging mechanisms through which they are expressed. While goal dimensions are interrelated, their predictive roles for an outcome are not redundant in a way that one goal dimension may fully substitute another. Instead, goal dimensions overlap to different degrees in predicting a specific outcome. These overlaps may inspire future research by providing insight into the joint mechanisms underlying the respective combinations of goal dimensions for that outcome. Moreover, these overlaps can be used to develop concise yet predictive instruments by including dimensions that make a large unique contribution to explaining an outcome, while excluding those whose explanatory power is largely covered by the included dimensions. Due to the outcome-specificity of these overlaps, we recommend conducting pilot studies to determine which dimensions have substantial unique explanatory power in a given context and which can be substituted by a combination of others. For now, we leave it to researchers to select dimensions from the Goal Dimensions Questionnaire based on their theoretical alignment and research questions.

Note that we aimed for a comprehensive and parsimonious measure of goal dimensions. Measures with more items per goal dimension can cover a dimension in more detail and may detect the predicted effects, such as Ryan et al.'s (1983) intrinsic motivation inventory (accessible at www.selfdeterminationtheory.org) for measures of external motivation (Diamantopoulos et al., 2012).

The present studies provide strong evidence for the construct validity of the goal progress scale, supporting its use as an additional indicator of successful goal pursuit. These preregistered predictions are consistent with those of Study 3. Detailed analyses are available in

the online supplement. In Study 3, all goal dimensions at T1 were positively associated with goal progress at T2, except for goal demand and external motivation. However, when controlling for goal progress at T1, only goal commitment and expectancy predicted goal progress at T2. In Study 4, RI-CLPMs revealed cross-sectional associations between goal progress and goal commitment, demand, enjoyment, expectancy, facilitation, support, and value, and cross-lagged associations with goal commitment, expectancy, and value. Notably, goal progress was consistently associated with goal commitment across studies, reflecting that both indicate effort during goal pursuit. However, goal progress but not goal commitment was related to satisfaction with performance and exam grade in Study 3, suggesting that a current evaluation of advancement may be a stronger predictor of goal outcomes than ongoing engagement alone.

Goal Dimensions in Theories of Goal Pursuit

Goal expectancy, progress, and enjoyment emerged as the most consistent predictors of successful goal pursuit and well-being across our studies, highlighting their central role in goal pursuit processes. The goal dimension scales are consistent with constructs from multiple theoretical frameworks, supporting their construct validity. Below, we outline how each of these dimensions is consistent with well-established theoretical perspectives. Goal expectancy is central to Expectancy-Value Theory (Eccles & Wigfield, 2002), which emphasizes that individuals' beliefs about their competence to achieve a goal directly influence their achievement-related choices, thereby enhancing performance and persistence. Social Cognitive Theory (Bandura, 2001) conceptualizes goal expectancy as belief in one's ability to achieve a goal. In addition, Hope Theory (Snyder, 2002) also highlights goal expectancy, emphasizing its role in planning and confidence in pursuing goals.

Goal progress plays a central role in Control Theory (Carver & Scheier, 1998), which views goal pursuit as a feedback loop: goal progress informs affect and guides regulation. When progress aligns with expectations, individuals experience positive affect and maintain engagement; when it falls short, they adjust effort or their strategies. This function of progress is

also emphasized in Self-Regulation Theory (Baumeister & Vohs, 2007), Expectancy-Value Theory (Wigfield & Eccles, 2000), and Goal-Setting Theory (Locke & Latham, 2002), all of which underscore the importance of monitoring progress for adaptive regulation.

Goal enjoyment is addressed in the Self-Determination Theory (Deci & Ryan, 2000), which conceptualizes it as central to intrinsic motivation, which energizes goal pursuit and supports persistence. Similarly, Interest Theory (Hidi & Renninger, 2006) highlights goal enjoyment as essential for sustaining attention and long-term goal pursuit. Affective-Reflective Theory (Brand & Ekkekakis, 2018) suggest that positive affective responses to a goal, such as experiencing enjoyment, facilitate continued goal pursuit through implicit motivational processes.

Limitations and Future Direction

In addition to establishing longitudinal associations between the GDQ scales and successful goal pursuit and well-being, further steps to provide information on external validity may include investigating causal relationships (Flake et al., 2017). Evidence of causal validity can be provided if the values of goal dimensions change as expected in response to changes in the attribute being measured (Borsboom et al., 2004). One could, for example, test whether experimentally strengthening goal commitment increases commitment measures or observing individuals experiencing partnership segregation decreases goal support measures. Additional validity evidence may be obtained by creating a nomological network in which the association strengths between GDQ scales and similar and different constructs are analyzed and compared (Campbell & Fiske, 1959; Tennant et al., 2021; Ziegler et al., 2013; for example, see Lee et al., 2024). This allows to control for possible confounding variables, such as the effect of high levels in the personality trait conscientiousness on goal dimensions and outcome measures (Gellatly, 1996).

Further important validity evidence may be provided by incorporating considerations of ecological validity, or the extent to which our results generalize from our study context to other

contexts (Flake et al., 2017; Kane, 2013). Goal pursuit in the contexts of Study 3 (academic goals) and Study 4 (New Year's resolutions) may be highly contingent on individual agency whereas goal pursuit in other contexts like work or team sport may be more contingent on external conditions (e.g., a supervisor's management style or team members' support). In turn, goal dimensions like commitment, expectancy, enjoyment, progress, and demand may have been more relevant to goal achievement and well-being than goal dimensions that, to a larger extent, also capture external conditions, for example, goal external motivation, support, and facilitation (Little, 2007). Thus, we recommend testing the predictive validity of goal dimensions across different contexts: Goal external motivation may show stronger effects when individual goal pursuit is more dependent on others, like work environments (Kanfer, 2012). Goal support may show stronger effects when goals are pursued in a group (Taylor, 2011). And goal facilitation may show the expected associations for goals that have strong intergoal relations such as health and hedonic goals (Boudreaux & Ozer, 2013).

Given that the development of the Goal Dimensions Questionnaire is based on mid-level goals, the extent to which our findings generalize to more abstract or more concrete goals remains uncertain. For instance, the factor structure identified in Study 1 may reflect specific characteristics of mid-level goals. Certain dimensions, such as goal facilitation, may not emerge in exploratory factor analysis or may function differently in the context of highly abstract goals, which may lack the behavioural specificity needed for meaningful intergoal interactions (Kruglanski et al., 2002). Future research may explore whether different goal levels elicit distinct dimensional structures or necessitate adaptations to the scale.

A possible confound in interpreting the results of Studies 3 and 4 is the inability to determine whether the observed associations reflect general properties of the goal dimensions or are specific to the mid-level of goal abstraction. The theories underlying our predictions may apply more closely to concrete task goals and may not fully capture mid-level goals. This could help explain results such as the absence of expected longitudinal associations between most

goal dimensions and well-being outcomes. Rather than undermining the construct validity of the questionnaire, this suggests that future research is needed to examine the interactions between goal level and goal dimensions.

We acknowledge that some of the significant associations in our studies may have been influenced by the measurement context. Specifically, explicitly stating and repeatedly reflecting on personal goals throughout the surveys may have increased goal salience and encouraged more active engagement that may not generalize outside the measurement context (Morwitz & Fitzsimons, 2004). In addition, the longitudinal tracking of participants may have introduced demand characteristics, leading participants to prioritize goal pursuit or present their progress in a more cohesive and socially acceptable way (Orne, 1962). These factors could limit the ecological validity of our findings and should be considered when interpreting the results.

Finally, we are not aware of a unifying theory that encompasses all goal dimensions measured by the Goal Dimensions Questionnaire. Such a theory may recognize that goal dimensions are not only related to outcomes but are also interrelated and that they might result from broader constructs such as personality traits or motives (Costantini et al., 2020; Musek, 2024; Wright, 2016). Integrating research findings in such a framework improves the comparability of individual study results and enhances our overall understanding of goal dimensions. A unifying theory of goal dimensions would characterize their unique and interactive effects on people’s behaviour, cognitions, emotions, and situations in service of their goals (Carver & Scheier, 1998).

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