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Chasing the "How" and "Why" of goal pursuit: A multimethod approach to the study of goal focus

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ABSTRACT

Goals are cognitive representations of means-ends relations that reflect what a person wants to approach or avoid. Previous research has demonstrated that the relative salience of the means and ends (i.e., goal focus) differs across adulthood. Due to inconsistent findings in recent studies, this study systematically investigated the convergence of goal focus across different dimensions (i.e., goal content, complexity, type, i.e., hypothetical vs. personal goals, and method of assessment) and its relation to age. To this end, we conducted a multimethod online study (N = 773) across an age range from 14 to 87 years. The results provide little support for the convergence of goal focus across different assessment methods and systematic associations with age. We discuss the implications of these findings for goal research.

1. Introduction

Goals are cognitive representations of means-ends associations (e.g., Kruglanski et al., 2002). They comprise information on how a person can achieve a desired or prevent a dreaded end state (i.e., the means) as well as on why a person pursues a certain goal (i.e., the end state and its consequences). Therefore, goals constitute an important part of human lives in that they provide direction and meaning (e.g., Emmons, 1996). Representations of ends are typically more abstract than representations of means because whereas means are bound to specific actions and contexts, the desired (or dreaded) end state is usually not (e.g., if the goal is to drink something, the desired end state of quenching one's thirst can be achieved in multiple, specific ways, such as bringing a cup to one's mouth or sipping through a straw, which do not matter for the more general end state of not feeling thirsty; e.g., Emmons, 1996; Kruglanski, 1996; Kruglanski et al., 2002). Previous research in adult development suggests that the relative salience of the means and ends of a given goal shifts developmentally. We refer to this relative salience of means and ends in a given goal as *goal focus*. If a person concentrates more on the means of goal pursuit, we term this *process focus*, if a person focuses more on the ends, we speak of an *outcome focus*. This does not mean that a person focusing on the ends of a goal does not also represent the means but rather that the means are less salient at a given point in time. Furthermore, goal focus does not constitute a general preference for more abstract representations but instead refers to a specific means-ends association.

Research on goal focus across adulthood has demonstrated that older adults focus more on the means relative to younger adults (e.g., Freund et al., 2010). One of the main explanations for this shift lies in the differences between the goals younger and older adults typically pursue. Whereas younger adults typically strive towards growth goals (i.e., they aim to achieve a higher end state), older adults oftentimes show a goal orientation towards maintenance or loss avoidance (i.e., they pursue goals in which they try to maintain the current state; Ebner et al., 2006; Freund, 2006). These differences in goal orientation might render an outcome focus (i.e., a focus on the end state) in younger adulthood and a process focus (i.e., a focus on the means) in older adulthood more likely (e.g., Freund et al., 2019; Mustafić & Freund, 2012). Another

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explanation considers the differences in future time perspective that typically occur between younger and older adults: Most younger adults perceive their future time as relatively unlimited compared to older adults. This potentially impacts the goals adults pursue (e.g., Lang & Carstensen, 2002). For goal focus, this could mean that the limited future time perspective makes older adults more likely to focus on the concrete, temporally closer means of goal pursuit than on its outcomes.

However, recent studies investigating goal focus across the entire lifespan yielded mixed results (Moersdorf et al., 2023). In a cross-sectional lab-based study, participants ranging from early childhood to old age (N = 312, age range: 3–83 years) completed a number of different goal-focus tasks including eye tracking (i.e., allocating overt attention to the means vs. ends of goal pursuit), behavioral (preference to act upon objects described in terms of means vs. ends; imitation of means vs. ends), and verbal measures (two-statements task, adapted from Vallacher and Wegner (1989); thinking exercise, adapted from Freund et al. (2010); motto items asking about general tendencies to care about the means and ends of goal pursuit). In the behavioral tasks, there was not much support for age-related differences. One online study replicated older adults' higher focus on the means relative to younger participants in one verbal measure (ten-statements task, adapted from Freund et al. (2010)) but found the opposite pattern in two other verbal measures (two-statements task, thinking exercise). These mixed findings led us to consider other goal-related factors that might impact a person's goal focus in a given goal. The main aim of this study was to systematically take such potential factors into account.

1.1. The role of goal complexity for goal focus

In our previous research, we identified one dimension that might be especially relevant for the investigation of differences in goal focus across the entire lifespan, namely goal complexity. Some goals are very simple, in that they require only a few steps to be achieved (typically shorter-term goals, located lower in a goal hierarchy). Other goals are very complex, that is they require more steps until reached (typically longer-term goals, located higher in a goal hierarchy). In the aforementioned study on age-related differences in goal focus across the entire lifespan (Moersdorf et al., 2023), we relied to a great extent on simple goals to make the tasks feasible for children. In contrast, across adulthood, previous goal focus research has investigated more complex goals (e.g., working out regularly), but without explicit consideration of goal complexity (e.g., Freund et al., 2010; Kaftan & Freund, 2020). Conversely, research on the identification of actions on different levels has focused on individual differences in the preference for low-level versus high-level goals (e.g., Emmons, 1992; Vallacher & Wegner, 1989), therefore at least considering potential effects of goal complexity on action identification on the theoretical level (Vallacher & Wegner, 1987). Thus, there exists currently no empirical work on the association between goal complexity and goal focus.

Simple goals might lend themselves more easily to an outcome focus: Relatively speaking, it is typically easier to complete only a few steps than a combination of many steps to achieve an outcome. Vallacher and Wegner (1987) suggest that people represent an action on the highest possible level of abstraction if no difficulties in goal pursuit are encountered. If this holds true, it is likely that people focus on the typically more abstract outcome compared to the more concrete means in simple goals (Freund & Hennecke, 2015). In complex goals, the opposite might be the case. Complex goals require one to coordinate multiple steps, to keep track of the steps already completed as well as the ones that lie ahead. Consequently, it is more likely that people encounter difficulties in their goal pursuit, which, according to Vallacher and Wegner (1987), should lead to a focus on the concrete level of the process rather than the more distal outcome. The notion that a higher difficulty of goal pursuit is associated with a process focus has been supported by Zimmerman and Kitsantas (1997, 1999). In addition, simple actions are often shorter in time and the temporally (and sometimes spatially) close outcome (as for example in the case of grasping an object) might therefore be more salient, given the required action is obvious. This time-based explanation makes contrary predictions to the ones derived from construal level theory (CLT; Trope & Liberman, 2003): According to CLT, events that lie in the farther future are represented more abstractly and hence might be more likely to evoke an outcome focus relative to temporally closer events. Under the assumption that simple goals are temporally closer than more complex goals, this speaks towards a process focus in simple goals as an alternative hypothesis.[2]

Why does goal complexity matter from a developmental perspective? Although the *absolute* complexity of a goal is independent of the person pursuing it, the *relative* complexity of a goal is highly sensitive to the competence and performance level of the person pursuing the goal and, therefore, sensitive to age. For instance, the goal of grasping a cup to drink water is simple relative to many other goals adults pursue such as furthering one's career or maintaining a good relationship with one's partner. In contrast, grasping a cup in order to drink from it is, relatively speaking, complex for infants who still have to learn the required motor movements and their coordination. Thus, goal focus might differ between young children and adults because, on average, a given goal becomes less complex across childhood due to the increasing experience and skills (for literature on the role of experience in skill acquisition, see e.g., Zimmerman & Kitsantas, 1997, 1999). However, this hypothesis was not supported in our previous study on age-related differences in goal focus in simple goals. Moreover, and again unexpectedly, older adults described simple actions more often in terms of their outcomes than younger adults did (Moersdorf et al., 2023). It seems unrealistic that older adults are more proficient in performing simple actions than younger adults.

In the current study, we investigate the role of complexity for goal focus directly as one of the potential factors contributing to age-related differences, hypothesizing that higher complexity increases the likelihood of a process focus. We do not assume that complexity interacts with age.

1.2. Different approaches to assessing goal focus

Differences in the few extant studies on age-related differences in goal focus might have contributed to the conflicting results: For instance, the content of the goals under investigation, the method of assessing goal focus, and whether goal focus was assessed regarding personal goals of the participants (henceforth called personal goals) or regarding goals the participants did not pursue themselves, but we provided (henceforth called hypothetical goals).

For instance, Kaftan and Freund (2020) assessed goal focus in people who had committed to participate in an eight-week high-intensity interval training program as a personal goal. This study assessed daily variations in goal focus using the endorsement of self-report items on a rating scale (e.g., "To what extent were you focusing on what you want to achieve with the workout?" for outcome focus). In a different type of assessment, Freund and colleagues (2010) asked about motives to exercise regularly in participants who also actually pursued this goal. In another type of assessment, they used a task in which participants chose the five out of ten goal descriptions that best fit the goal in their opinion (ten-statements task), where half of the statements referred to the means, and half of the statements to the outcomes of hypothetical goals. The variable of interest was the number of means statements participants chose. Another assessment of goal focus was a *thinking exercise* in which participants chose whether they preferred to think about the

[2] Because the time-based explanations suggesting opposing predictions were not part of our preregistration, we mention them here but do not adopt the alternative hypothesis of an increasing outcome focus in complex goals in the remaining sections.

"Hows" or "Whys" of pursuing a hypothetical goal. The Moersdorf et al. (2023) study also used this thinking exercise, and instead of the ten-statements task, a two-statements task (adapted from Vallacher and Wegner, 1989) with simple goals to decrease task difficulty for younger participants. Thus, this study used exclusively hypothetical goals.

Taken together, the different studies used measures of goal focus that varied in multiple ways, such as the goal content, goal type (personal vs. hypothetical goals), and assessment method. These differences in measures might have contributed to inconsistent results. If despite their differences, all measures tap into the same construct of goal focus, one would expect that they converge, and all show the same relation to age.

1.3. The current study

Taken together, the main goal of this study was threefold: 1) to investigate whether different measures to assess goal focus converge across goal content (leisure vs. fitness/health life domain), complexity (simple vs. complex goals), type (personal vs. hypothetical goals), and method of assessment, 2) to test whether age has a main effect on goal focus, in that older adults focus more on the means relative to younger adults across the different measures (Freund et al., 2019), and 3) to assess whether goal complexity has a main effect on goal focus, in that simpler goals are more likely to entail an outcome focus relative to more complex goals. In order to explore and disentangle these effects of age and measures on goal focus, we used a multimethod design in a comprehensive study using an online questionnaire. A multimethod approach allows to systematically investigate the impact of multiple (method) factors on the construct of interest (here: goal focus) within one model. This permits estimating the convergence of measures across different factors as well as each factor's effect simultaneously. In the case of goal focus, this promised to shed light on methodological reasons for the inconsistent results through the systematic variation of goal content, type, complexity, and assessment method. This study was preregistered at https://osf.io/wp62x/?view_only=ba2834f063104955bdd78523dc8166f2.

2. Methods

2.1. Sample

The sample consisted of a total of $N = 773$ participants with an age range from 14 to 87 years, with age and gender distributed as equally as possible across the sample. For an overview of the age and gender distribution, see Table 1. We recruited the participants in Germany, Austria, and the German-speaking part of Switzerland through an online research agency (https://www.respondi.com). All participants were reimbursed according to the research agency's regulations. The study was in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments and the ethics committee of the University. No deception was used. Our planned sample size of $N = 750$ participants was based on the recommendations provided by Nussbeck and colleagues (2006) for MTMM analyses for ordinal data.

Table 1
Number of Participants, Distribution of Gender and Age per Age Group.

Age (years)	Total *n*	*n* female	*n* male	M_{age}	SD_{age}
14–17	93	50	43	15.75	1.05
18–24	96	48	47	20.96	2.00
25–34	98	49	49	29.78	2.84
35–44	101	51	50	39.62	2.93
45–54	101	49	51	49.95	2.82
55–64	92	45	47	59.71	2.88
65–74	99	50	49	70.36	2.60
75+	93	45	48	78.59	3.11
Total	773[a]	387	384	45.55	21.49

Note. [a]Two participants indicated "diverse" as their gender.

We included three quality checks in our survey: Two quality checks asked the participants to click on a certain response option. If they failed to do so, they were screened out so that they could not complete the survey. A third check asked them to indicate their date of birth at the beginning and for a second time at the end of the survey. If the two dates of birth did not match, we also screened out these participants. A total of 2686 participants started the survey, of which 200 only completed the first two pages (consent form page), 814 only the first four pages (sociodemographic information for quotation), and 477 only the first nine pages (page nine included a quality check). On most other pages there were dropouts of 1–91 participants, so 773 participants completed the entire survey. Upon completion of data collection, we inspected the open-ended questions where the participants were supposed to enter their personal goals. In cases in which we detected random letters or special characters instead of proper words, or constantly the same words, we excluded the respective goal. Recruitment continued until each cell was filled with a sufficiently large number of participants (8 age groups × 2 genders = 16 cells; 750 planned participants/16 cells ≈ 47 participants per cell). Due to problems filling some of the cells, we opened our quotation towards the end of recruitment to allow more participants in other cells (see Table 1).

2.2. Design

To investigate whether different measures to assess goal focus converge in a multimethod approach, we assessed goal focus in two different life domains (i.e., leisure and fitness/health, to account for goal content) with respect to two different types of goals (personal vs. hypothetical goals) differing in goal complexity (simple action vs. complex goal), and method of assessment (two-statements task, thinking exercise, ten-statements task). For an overview of the design, see Table 2. The participants provided two simple and two complex goals for each life domain (a total of eight goals) and rated each of them in the two-statements task and the thinking exercise (for a description of the tasks, see Procedure below). For the hypothetical goals, we provided two simple and two complex goals for each life domain in the two-statements task and thinking exercise, and two slightly different simple and complex goals for each life domain in the ten-statements task (i.e., a total of 16 goals). As a result, we obtained two indicators for each combination of goal content (leisure, fitness) and the three other manipulated method

Table 2
Overview of the Study Design: Assessed Goals Structured by the Manipulated Factors.

Goal content	Method of assessment	Goal type: Personal goals		Goal type: Hypothetical goals	
		Simple goals	*Complex goals*	*Simple goals*	*Complex goals*
Leisure goals	*Two-statements task // Thinking exercise*	Leisure PS1 Leisure PS2	Leisure PC1 Leisure PC2	Leisure HS1 (Music) Leisure HS2 (Travel)	Leisure HC1 (Music) Leisure HC2 (Travel)
	Ten-statements task	–	–	Leisure HS3 (Music) Leisure HS4 (Travel)	Leisure HC3 (Music) Leisure HC4 (Travel)
Fitness goals	*Two-statements task // Thinking exercise*	Fitness PS1 Fitness PS2	Fitness PC1 Fitness PC2	Fitness HS1 (Sports) Fitness HS2 (Nutrition)	Fitness HC1 (Sports) Fitness HC2 (Nutrition)
	Ten-statements task	–	–	Fitness HS3 (Sports) Fitness HS4 (Nutrition)	Fitness HC3 (Sports) Fitness HC4 (Nutrition)

Note. PS = Personal simple goals, PC = Personal complex goals, HS = Hypothetical simple goals, HC = Hypothetical complex goals.

factors (see each cell in Table 2). Having at least two indicators for each combination constitutes an important precondition to separate unsystematic measurement error from systematic influences due to the manipulated factors (Eid et al., 2003). Additionally, we asked the participants to rate the perceived complexity of each goal to reveal whether our manipulation worked as expected.

2.3. Procedure

After giving informed consent, the participants provided demographic information, such as age, gender, country of residence, level of education, occupational status, subjective health, and life satisfaction. Afterwards, the participants learned that different types of goals existed: We explained that there were growth, maintenance, and loss-avoiding goals, and introduced short-term vs. long-term goals ("everyday things" vs. "longer-term matters") as a proxy for simple and complex goals. Then the participants listed a total of four simple goals they currently pursued (two in the domain of leisure and two in the domain of fitness/health, e.g., reading, sports, garden work, and cooking; see Appendix A for a translation of the instructions) and rated, among questions not relevant here, the complexity of each goal (i.e., "How complex is the goal, that is, how many steps are needed to achieve it?", rating scale from 0 to 6[3]). Then they listed a typical "how" (means) and "why" (outcome) description of each goal. In the next step, they decided which description (means or outcome) described the goal better in their opinion (two-statements task). Next, the participants indicated for each goal whether they preferred to think about the "hows" or "whys," and one of their goals was randomly chosen for the thinking exercise (i.e., thinking about two "hows" or two "whys"; instructions adapted from Freund et al. [2010], for a translation, see Appendix B).

This random choice was introduced to motivate participants to indicate their real preferences for every goal, yet avoid overburdening them by conducting the actual thinking exercise only once. For analysis, the indicated preferences for each goal were used (referred to as thinking exercise). The same procedure was repeated for four complex goals the participants currently pursued (e.g., travel, spend time with family/friends, do more sports, lose weight). We did not include the ten-statements task for the participants' personal goals, because for this task the participants would have had to list five means and five outcomes for each goal in order to choose the five descriptions that best described the goal. Coming up with a total of ten descriptions for each goal would have posed a too large demand on the participants.

After this part on personal goals, the participants read a means and an outcome description of each of the different hypothetical goals (from the same life domains as the personal goals) and decided again, which description better fitted the goal (two-statements task). For instance, for the simple goal "book a train ride," the participants could choose whether "find a good train connection" (means statement) or "visit a different place" (outcome statement) was the description that fit better with their own perception of the statement (for a translation of the instructions, see Appendix C). Then, they indicated for each goal whether they preferred to think about the "hows" or "whys" of this goal, and again, one goal was randomly chosen for the "thinking exercise." Next, we presented the ten-statements task with similar goals as those presented in the two-statements task (e.g., "buy a travel guide" instead of "book a train ride; for a complete example, see Appendix D). This time, the participants had to choose five out of ten provided statements that from their perspective best described the respective goal (five means and five outcome statements were provided). For each of the hypothetical goals, the participants also completed the rating of goal complexity. For the complete material, please see the pdf version of our survey or the actual survey (.xml file) on OSF at https://osf.io/z68x2/?view_only=f3e9453665f240b6a00cb1400c1447b7.

[3] Output values from SoSci Survey (Leiner, 2019) ranged from 1 to 7.

2.4. Data preprocessing and analysis

We conducted all steps of data preprocessing and analysis in R (R Core Team, 2018). During preprocessing, we first defined missing values in the open-ended questions as described in the exclusion criteria based on visual inspection. Apart from setting random letters and special characters to missing values, we defined certain actual words that did not represent a goal (or means/outcome) in our view (such as "yes," "no," "no idea," "see above") as missing values. For the entire list, see the "prep_script" R script on OSF, where we also provide the data. Based on these missing replies, we also set to missing the respective answers that built on these replies. Further, we recoded the items so that higher values indicated a process focus (i.e., 0 = outcome, 1 = means, for all binary items). Regarding the ten-statements task, we summed the number of means statements chosen per goal, similar to the procedure of Freund et al. (2010) but without creating the mean score across the goals.

To check if the participants' perception of the complexity of the hypothetical simple goals matched our classification, we ran a paired sample *t*-test across the mean complexity ratings of the simple goals as compared to the mean complexity ratings of the complex goals. We followed the same procedure for the participants' personal goals.

For the analysis of the convergence of the goal focus measurements across the different factors listed in Table 2, we chose a model that allows to separate different sources of variance. This model is depicted in Fig. 1 and is an extended version of a model that is called *correlated trait – correlated method minus one [CTC(M-1)] model* (Eid et al., 2003; Eid et al., 2008) or *bifactor (S-1) model* (Eid et al., 2017). Because the observed variables are categorial rating scales we applied the approach for ordinal data (Eid et al., 2017; Nussbeck et al., 2006), using structural equation modeling with the lavaan package (DWLS estimator, version 0.6–5; Rosseel, 2012) in R (R Core Team, 2018). The model is depicted in Fig. 1. It consists of two submodels, one for personal and one for hypothetical goals. This distinction was made because these two types of goals differ in the assessment methods applied.

In the submodel for the personal goals, we have chosen the simple goals assessed by the two-statements task to define a latent goal focus factor that is called "personal" (see Fig. 1). This factor represents latent individual differences with respect to simple goals assessed by the two-statements task (across the two goal contents) that are free from measurement error. For all complex goals, there is a common factor called "complex" that represents individual differences that are specific to complex goals and not predictable by simple goals. It is a residual factor that indicates to which degree complex goals differ in their goal focus from simple goals. Finally, there are two method factors for the thinking exercise, the second assessment method, one for the leisure goals and one for the fitness goals. They represent individual differences in goal focus that are specific to this assessment method and not shared with the two-statements task that is taken as reference method. This measurement model allows the decomposition of an observed variable in different sources of variance. Based on the factors on which an observed variable can load, the variance of an observed variable can be decomposed into the different sources of variance. Variance components can be defined that allow estimating the percentage of variance that is due to different sources of variance. If the complexity of a goal and the assessment method do not play an important role in the assessment of goal focus, the variance of the complex and method factors should be comparatively low.

The submodel for the hypothetical goals is similar to the submodel for the personal goals. However, the variance of the complexity factor was very low causing estimation problems and was removed. Moreover, there are two additional method factors for the ten-statements task that was not administered for the personal goals. The common factors and the method factors of both submodels can be correlated and indicate to which degree the goal focus generalizes across the goal type.

In sum, the two submodels allowed us to find out whether there is

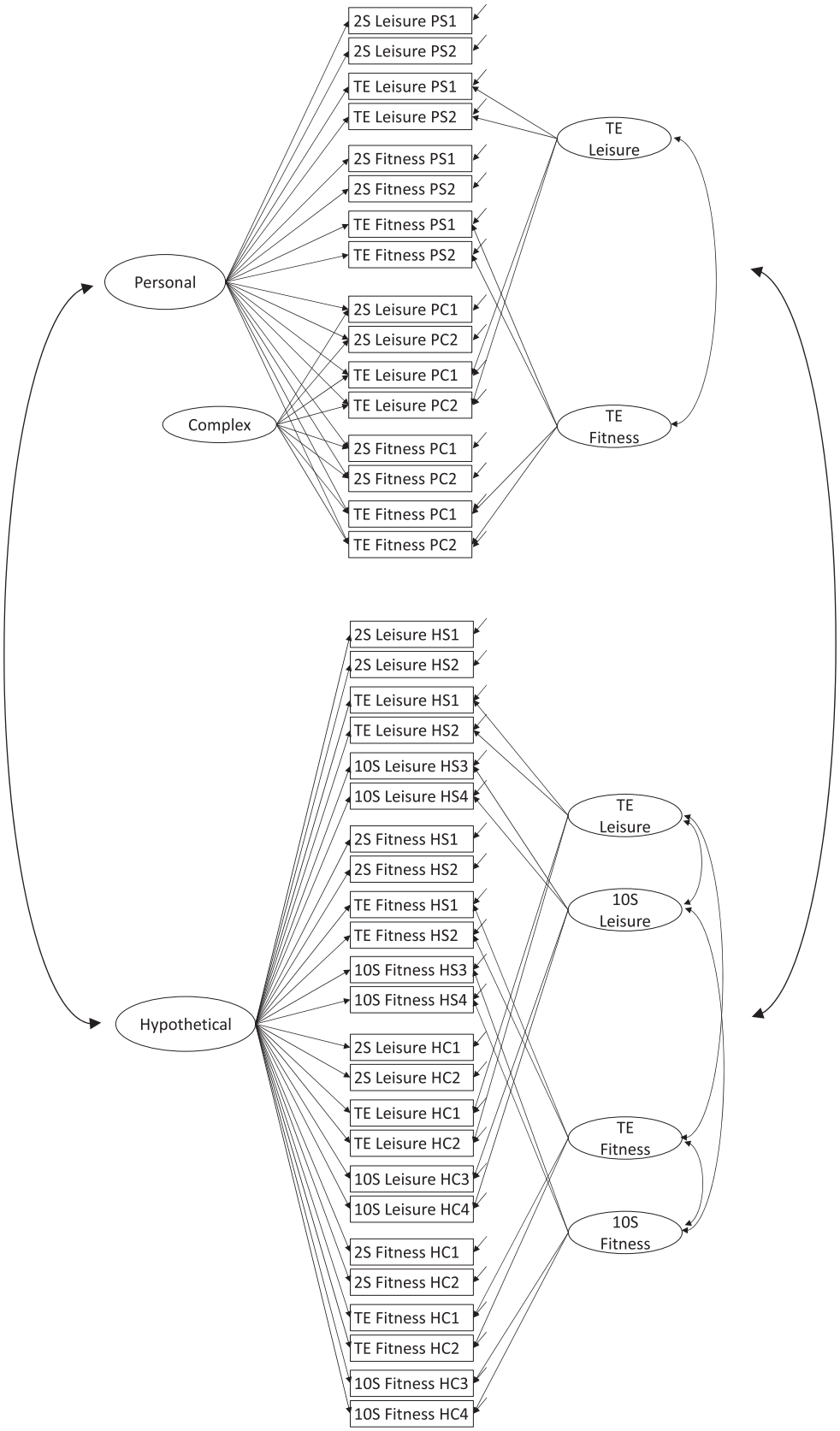

Fig. 1. Depiction of the CTC(M-1) model. *Note.* 2S = Two-statements task, TE = Thinking exercise, 10S = Ten-statements task, PS = Personal simple goals, PC = Personal complex goals, HS = Hypothetical simple goals, HC = Hypothetical complex goals. Across submodels, method factors with the same assessment method and/or life domain were allowed to correlate.

support for an overarching goal focus within the personal and hypothetical goals, or whether specific effects of goal content, complexity, and assessment method need to be taken into account when investigating age-related differences in goal focus. Together with age as a predictor, this model allowed us to answer our first two research questions, that is, whether the different measures converge (across goal content, complexity, type, and method of assessment) and whether age has a main effect on goal focus.

Finally, we investigated the third research question, namely the main effect of goal complexity on goal focus. To this end, we constructed separate models for each relevance level of goal (personal vs. hypothetical), goal content (leisure vs. fitness), and assessment method (two-statements task, thinking exercise, ten-statements task), which resulted in a total of 10 models. Each model consisted of a "simple" and a "complex" factor between which the loadings and thresholds of the respective items were constrained to be equal to ensure measurement invariance. The latent mean for "simple" was constrained to zero, and the latent mean for "complex" was freely estimated to conduct a latent *t*-test.

Because the analyses showed that measurement invariance could not be ensured (some analyses showed convergence problems) for the hypothetical goals, we refrained from interpreting these models and therefore only report the main effect of goal complexity for the personal goals. To account for multiple testing within the personal goals (four models), only *p* values smaller than 0.0125 (Bonferroni correction: 0.05/4) were considered significant.

3. Results

3.1. Goal complexity ratings

Indicating the manipulation of complexity was successful, the paired sample *t*-test showed on average higher complexity ratings for complex personal goals ($M = 4.60$, $SD = 1.42$) relative to simple personal goals ($M = 3.90$, $SD = 1.39$), $t(687) = -14.016$, $p < .001$, Cohen's $d = 0.53$ (95% CI [0.45, 0.61]). The same was true for the hypothetical goals (simple goals: $M = 3.58$, $SD = 1.07$; complex goals: $M = 4.70$, $SD = 1.14$), $t(770) = -39.295$, $p < .001$, Cohen's $d = 1.42$ (95% CI [1.32, 1.51]). Descriptive statistics of the complexity ratings as well as the variables considered in the confirmatory factor analyses are presented in the Supplementary Material (Table S2).

3.2. Confirmatory factor analyses

In this section, we present the results of the main model presented in Fig. 1, which combined the two submodels of personal and hypothetical goals. This model provides information on the first two research questions: (1) whether there is an overarching goal focus across different method factors and goal content, as well as (2) how goal focus relates to age. The overall model showed an acceptable fit, $\chi^2(727) = 1030.427$, $p < .001$, RMSEA = 0.023, 90% CI [0.020; 0.026], CFI = 0.943, SRMR = 0.065. Table 3 depicts the correlations between the trait and method factors of the overall model. For the variances and covariances of the trait and method factors, see Table S3 in the Supplementary Material. We start by reporting the submodel of the participants' personal goals, followed by the submodel of the hypothetical goals, and then the associations between the two submodels.

3.2.1. Submodel of personal goals

For the submodel of personal goals, the correlation of $r = 0.596$ ($p < .001$) between the "personal leisure goals thinking exercise" and the "personal fitness goals thinking exercise" factors indicates that they shared a relatively large proportion of variance, which was not accounted for by the reference method (see Table 3). Therefore, it seems that goal focus converges within the thinking exercise method across life domains.

Table 4 shows the variance components calculated for the true-score variables that are underlying the observed response variables (see Eid et al., 2003, for a more detailed description of their calculation). A consistency coefficient represents the proportion of true (error-free) variance of an indicator that is due to the variance emerging from the personal factor in Fig. 1. It indicates the amount of true variance explained by simple personal goals assessed by the two-statements method. The square root of a consistency coefficient is a latent correlation and indicates the convergent validity with respect to the reference goal-method unit (simple personal goals assessed by the two-statements method). The method specificity coefficient is the proportion of true variance of a non-reference-method indicator that is due to the specific method factor, and, therefore, not shared with the reference method.

The goal complexity specificity coefficient indicates the proportion of true variance that is due to the goal complexity factor. The consistency, method specificity, and complexity specificity coefficients of an indicator add up to 1. For the thinking exercise, the estimated consistency coefficients are very low (0.000 – 0.158) and the method specificity coefficients are relatively high (0.684 – 0.975), indicating strong assessment method effects and very low convergent validity for these two different assessment methods. Interestingly, the thinking exercise indicators of the simple fitness goals showed some convergence with the reference method, whereas the thinking exercise indicators of the simple leisure goals did less so. Also, the correlations close to zero with the thinking exercise indicators for complex goals within the leisure domain (as compared to these indicators in the fitness domain) were surprising.

The consistency coefficients of the two-statements task across goal complexity in the leisure domain are comparatively high (0.532 – 0.546)

Table 3
Correlations of Trait and Method Factors.

Factor	1.	2.	3.	4.	5.	6.	7.	8.
1. Personal	–							
2. Personal – Leisure – TE		–						
3. Personal – Fitness – TE		0.596*** [0.483, 0.709]	–					
4. Personal – Complex				–				
5. Hypothetical	0.198 [0.053, 0.343]				–			
6. Hypothetical – Leisure – TE		0.625*** [0.476, 0.774]	0.489*** [0.344, 0.633]			–		
7. Hypothetical – Fitness – TE		0.585*** [0.463, 0.708]	0.734*** [0.636, 0.833]			0.598*** [0.471, 0.724]	–	
8. Hypothetical – Leisure – 10S		−0.006 [−0.014, 0.128]				0.118 [0.004, 0.232]		–
9. Hypothetical – Fitness – 10S			0.080 [−0.047, 0.207]				−0.007 [−0.109, 0.096]	0.896*** [0.825, 0.967]

Note. Empty cells mark correlations that were fixed to zero; * $p < .05$, ** $p < .01$, *** $p < .001$; [] indicate 95% CIs; TE = Thinking exercise, 10S = Ten-statements task.

Table 4
Variance Components of the True-Score Variables, Submodel of Personal Goals.

Rating	Consistency	Method Specificity	Goal Complexity Specificity	Latent Correlation[a]	Reliability
	Leisure – Simple Goals				
Two-statements task					
First Indicator	1.00				0.153
Second Indicator	1.00				0.167
Thinking Exercise					
First Indicator	0.061	0.939		0.246	0.255
Second Indicator	0.025	0.975		0.160	0.295
	Leisure – Complex Goals				
Two-statements task					
First Indicator	0.546		0.454	0.739	0.263
Second Indicator	0.532		0.468	0.729	0.219
Thinking Exercise					
First Indicator	0.003	0.909	0.087	0.058	0.503
Second Indicator	<0.001	0.900	0.100	0.016	0.398
	Fitness – Simple Goals				
Two-statements task					
First Indicator	1.00				0.278
Second Indicator	1.00				0.390
Thinking Exercise					
First Indicator	0.158	0.842		0.398	0.513
Second Indicator	0.091	0.909		0.302	0.530
	Fitness – Complex Goals				
Two-statements task					
First Indicator	0.360		0.640	0.600	0.333
Second Indicator	0.328		0.672	0.572	0.405
Thinking Exercise					
First Indicator	0.024	0.798	0.178	0.154	0.655
Second Indicator	0.030	0.684	0.286	0.172	0.663

Note. [a] Latent correlation with the reference method ($\sqrt{}$consistency).

and are a bit higher than the complexity specificity coefficients (0.454 – 0.468) indicating relatively high convergent validity (correlations are 0.739 and 0.729) between the simple and complex goals. Hence, there is much higher convergence for goals differing in their complexity than for different assessment methods (assessing the same goal). In the two-statements task for the fitness domain, consistency coefficients were lower across goal complexity (328–360), while complexity specificity coefficients were higher (640–672). Together with the lower latent correlations, this indicates a lower convergence for goals of different complexity in the fitness domain.

Furthermore, the reliability coefficients of most items were very low, demonstrating that the items that had been constructed to belong to the same scale are rather heterogeneous and do not indicate a general construct of an overarching goal focus.

Regarding the association of goal focus with age, none of the factors showed a significant correlation ("personal goals" factor: $r = 0.069$, $p = .220$; "personal goals complexity" factor: $r = 0.073$, $p = .279$; "personal leisure goals thinking exercise" factor: $r = 0.088$, $p = .098$; "personal fitness goals thinking exercise" factor: $r = 0.067$; $p = .149$). This indicates that neither the participants' overarching goal focus nor method-specific variance in goal focus in participants' personal goals was related to their age. The unstandardized and standardized loading parameters for this submodel are shown in Table S4 in the Supplementary Material.

3.2.2. Submodel of hypothetical goals

For the submodel of hypothetical goals, the correlation of $r = 0.598$ ($p < .001$) between the "hypothetical leisure goals thinking exercise" and the "hypothetical fitness goals thinking exercise" method factors indicates that they shared a relatively large proportion of variance, which was not accounted for by the reference method (see Table 3). The same holds true for the "hypothetical leisure goals ten-statements" and the "hypothetical fitness goals ten-statements" method factors with an even higher correlation ($r = 0.896$, $p < .001$). Thus, it seems that goal focus converges within the thinking exercise and ten-statements method across life domains, and that method effects generalize across life domains.

Table 5 depicts the variance components of the true-score variables. The consistency values were small to medium large for the thinking exercise and the ten-statements task (0.035–0.555; expressed as latent correlation coefficients: 0.187–0.745). This speaks to a certain degree of convergence across goal complexity, goal content, and assessment method when the simple leisure goals two-statements task is used as reference method. Especially some indicators of the ten-statements task showed comparatively large convergence with the reference method across goal content and complexity. With a few exceptions, the reliability coefficients of the items were very low, suggesting that similar to the personal goals, the goal focus items of hypothetical goals did not measure a homogenous, overarching construct of goal focus.

As to the association of goal focus with age, the "hypothetical" factor did not show a significant correlation ($r = 0.183$, $p = .416$). However, the "ten-statements" method factors significantly correlated negatively with age, while the "thinking exercise" factors failed to reach significant positive correlations ("leisure goals ten-statements" factor: $r = -0.199$, $p < .001$; "fitness goals ten-statements" factor: $r = -0.157$, $p = .004$; "leisure goals thinking exercise" factor: $r = 0.096$, $p = .121$; "fitness goals thinking exercise" factor: $r = 0.093$, $p = .062$). This demonstrates that across the hypothetical goals, the participants' overarching goal focus was not related to their age. The method-specific associations of goal focus and age suggest that there might be an age-differential method effect: Relative to younger adults, older adults chose more outcome statements in the ten-statements task, but chose similarly often to think about the means in the thinking exercise. Because of their small size, we consider these findings to reflect tendencies rather than solid effects. The unstandardized and standardized loading parameters for this submodel are provided in Table S5 in the Supplementary Material.

3.2.3. Associations of personal and hypothetical goals

Goal focus between personal and hypothetical goals did not converge with respect to simple goals assessed by the two-statements method ($r = 0.198$, $p = .440$, see Table 3). However, the factors based on the same assessment method (i.e., the thinking exercise) correlated significantly, both within the same life domain (leisure: $r = 0.625$, $p < .001$; fitness: r

Table 5
Variance Components of the True-Score Variables, Submodel of Hypothetical Goals.

Rating	Consistency	Method Specificity	Goal Complexity Specificity	Latent Correlation[a]	Reliability
	Leisure – Simple Goals				
Two-statements task					
First Indicator	1.00				0.003
Second Indicator	1.00				0.208
Thinking Exercise					
First Indicator	0.229	0.771		0.478	0.240
Second Indicator	0.127	0.873		0.357	0.250
Ten-statements task					
First Indicator	0.297	0.703		0.544	0.358
Second Indicator	0.108	0.892		0.329	0.574
	Leisure – Complex Goals				
Two-statements task					
First Indicator	1.00				0.186
Second Indicator	1.00				0.291
Thinking Exercise					
First Indicator	0.109	0.891		0.331	0.471
Second Indicator	0.071	0.929		0.267	0.224
Ten-statements task					
First Indicator	0.278	0.722		0.527	0.275
Second Indicator	0.555	0.445		0.745	0.299
	Fitness – Simple Goals				
Two-statements task					
First Indicator	1.00				0.090
Second Indicator	1.00				0.183
Thinking Exercise					
First Indicator	0.035	0.965		0.187	0.448
Second Indicator	0.215	0.785		0.463	0.484
Ten-statements task					
First Indicator	0.248	0.752		0.498	0.371
Second Indicator	0.553	0.447		0.744	0.398
	Fitness – Complex Goals				
Two-statements task					
First Indicator	1.00				0.066
Second Indicator	1.00				0.144
Thinking Exercise					
First Indicator	0.057	0.943		0.238	0.587
Second Indicator	0.140	0.860		0.375	0.573
Ten-statements task					
First Indicator	0.415	0.585		0.644	0.532
Second Indicator	0.153	0.847		0.391	0.396

Note. [a] Latent correlation with the reference method ($\sqrt{\text{consistency}}$).

$= 0.734$, $p < .001$) and across life domains (personal leisure goals, hypothetical fitness goals: $r = 0.585$, $p < .001$; personal fitness goals, hypothetical leisure goals: $r = 0.489$, $p < .001$). This indicates that at least within the thinking exercise, goal focus converges across personal and hypothetical goals and life domains (i.e., the part of variance that is not shared with the two-statements task). There were no significant correlations between factors of different assessment methods within the same life domain.

3.3. Main effect of goal complexity

Regarding the third research question, namely whether there is a main effect of goal complexity, we only consider the personal goal models (as stated in the Data Preprocessing and Analysis section). All of these models showed an appropriate model fit (leisure goals two-statements task: $\chi^2(3) = 0.633$, $p = .889$, RMSEA < 0.001, 90% CI [<0.001; 0.028], CFI $= 1.00$; fitness goals two-statements task: $\chi^2(3) = 0.137$, $p = .987$, RMSEA < 0.001, 90% CI [. < 001; <0.001], CFI $= 1.00$; leisure goals thinking exercise: $\chi^2(3) = 2.434$, $p = .487$, RMSEA < 0.001, 90% CI [<0.001; 0.056], CFI $= 1.00$; fitness goals thinking exercise: $\chi^2(3) = 2.516$, $p = .472$, RMSEA < 0.001, 90% CI [<0.001; 0.057], CFI $= 1.00$). Goal focus in simple and complex goals was positively correlated in three out of four models (leisure goals two-statements task: $r = 0.315$, $p = .249$, 95% CI [−0.221, 0.851]; fitness goals two-statements task: $r = 0.369$, $p = .008$, 95% CI [0.098, 0.640]; leisure goals thinking exercise: $r = 0.748$, $p < .001$, 95% CI [0.559, 0.928]; fitness goals thinking exercise: $r = 0.548$, $p < .001$, 95% CI [0.435, 0.662]). However, only in the leisure goals thinking exercise model, goal focus was significantly higher (i.e., a relatively higher focus towards the means) for complex relative to simple goals ($z = 3.887$, $p < .001$). In all other models, goal focus did not differ significantly between simple and complex goals when adjusting the alpha-level using the Bonferroni correction (i.e., adjusted $p < .0125$; leisure goals two-statements task: $z = 2.285$, $p = .022$; fitness goals two-statements task: $z = 1.716$, $p = .086$; fitness goals thinking exercise: $z = 2.199$, $p = .028$).

4. Discussion

The aim of this comprehensive online study with 773 adults aged between 14 and 87 years was threefold: (1) to investigate whether different measures of goal focus converge, (2) whether and how the goal focus measures relate to age, and (3) whether and how goal complexity affects goal focus. The results provide only very little support for our hypotheses that (1) different measures of goal focus converge, (2) process focus increases with age while outcome focus decreases, and (3) higher goal complexity is related to a stronger process focus.

Concerning the convergence of measures, the overall picture speaks more for the specificity than the generalizability of goal focus. Whereas we found significant associations within the same assessment method across the different goal dimensions (as also indicated by the correlations we report in the analysis on the main effect of goal complexity), we did not find associations within the other dimensions across assessment method. The low reliabilities of the items emphasize that there does not seem to be an underlying general construct of goal focus. Instead, the

items seem to assess preferences that are specific to certain methods. For instance, the choices in the thinking exercise converged to a certain degree across life domain, goal complexity, and even relevance (personal vs. hypothetical goals). Therefore, one might be tempted to argue that this method assesses goal focus across goals. However, this might also reflect an effect of the specific assessment method. Furthermore, for the hypothetical goals, there was some convergence across methods, which might at first glance seem like we were assessing a general goal-focus construct. However, looking more closely, one realized that it was primarily the ten-statements task that converged with the two-statements task. Because these two measures are highly similar in structure (the structure and instruction are almost the same, except for the number of statements), we assume that again, convergence was due to specific, task-related preferences.

Given these results, the inconsistent correlation pattern of goal focus with age is not surprising: Within the participants' personal goals, there was no significant correlation of any assessment of goal focus with age, and within the hypothetical goals only the correlations of some method factors and age were significant. If goal focus is not a general and homogeneous construct across different kinds of goals, systematic relations with age are unlikely.

At first glance, this seems to contradict previous studies that found an association between goal focus and age, both for personal and hypothetical goals (e.g., Freund et al., 2010). Previous studies kept the goal content of personal goals constant by recruiting participants who all pursued the same goal (e.g., losing weight, exercising regularly; Freund & Hennecke, 2012; Kaftan & Freund, 2020). In this way, goal-specific variations in goal focus could be controlled to a higher degree. However, note that this procedure still leaves room for individual differences in representing the respective goal. In our view, this is important because of the idiosyncratic nature of goals and helps ensure ecological validity. Also, this allows the individual goals to vary with respect to certain dimensions, such as goal orientation, which might represent crucial age-related differences in goals. One limitation of this approach is that it only considers a specific part of the population, that is people aiming to lose weight/exercise regularly. Therefore, we recommend for future studies to carefully weigh how broad versus narrow the goal domains should be.

Furthermore, some of these studies used other methods than the current study to assess goal focus, by asking more generally how much the participants focused on the "how" and "why" of pursuing their actual goals. In the current study, the participants had to name and describe their personal goals that differed from person to person. Beyond differences in goal content, this might have led to interindividual differences regarding the specificity of the goals and the prototypicality of the descriptions in terms of means or outcomes. Depending on how typical or specific participants perceived their means and outcome descriptions to be, they might have indicated a "goal focus" that does not necessarily reflect the one they adopt in their everyday lives but might reflect a preference for a specific description. This might have obscured the correlation between goal focus and age within the personal goals.

Regarding the hypothetical goals, our previous studies (Moersdorf et al., 2023) have already suggested contradictory associations between goal focus and age, depending, among others, on the assessment method. In the current systematic investigation, the correlation patterns were yet again different: Whereas the method-specific ten-statements factors were negatively correlated with age (i.e., older adults chose more outcome statements relative to younger adults), the thinking exercise factors did not correlate with age (i.e., older adults similarly often chose to think about the means relative to younger adults). In previous studies, the ten-statements task was positively associated with age and the thinking exercise negatively (Freund et al., 2010; Moersdorf et al., 2023). On the one hand, differences in goal content might contribute to these findings. On the other hand, the decomposing of variance might play a role (note that in previous studies, we correlated the manifest variables with age, here we correlated latent method factors from which the variance accounted for by the reference method was removed). Additionally, the correlation coefficients in this study as well as in the previous studies were relatively small.

Concerning the main effect of goal complexity (research question three), due to convergence problems of the models of hypothetical goals we were only able to report results for the personal goals. These convergence problems might indicate that, especially for the hypothetical goals, our assumptions regarding the factor structure did not hold (e.g., same factor loadings for simple and complex goals). Consequently, one could argue that the items we had constructed did not reflect the intended construct of a general goal focus. Instead, each item seems to hold mainly unique variance, which would speak for the goal-specificity of goal focus. Within the participants' personal goals, complexity was associated with a preference for a process focus in the thinking exercise only for their leisure goals. This finding is in line with our prediction but raises the question of why the differences did not become significant for the other comparisons. One explanation could be that although we restricted goal content to certain life domains (leisure, fitness/health), the participants could choose very diverse goals within one domain, making comparisons between simple and complex goals difficult. As a result, differences in goal content might have impacted goal focus and, therefore, obscured the effect of goal complexity. Alternatively, it is possible that the manipulation of goal complexity was not strong enough. Although on average rated as slightly less complex than the midpoint of the scale, some of the simple goals were rated as rather complex than simple on the rating scale (though not relative to the complex goals). Finally, the main effect of goal complexity might not be as robust as expected.

Another aspect that might have contributed to the mixed findings constitutes the scales on which we assessed goal focus. At least the thinking exercise and the two-statements tasks asked the participants to decide for either the means or outcomes, which does not reflect the assumed continuity of goal focus very well. For participants who neither experienced a strong process nor outcome focus these binary decisions might have been difficult to take and they might have based their decisions on item-specific properties instead of a more general goal focus.

Taken together, the current study showed an overall low consistency of goal focus across goals and highlighted the strong impact of its assessment method and goal specificity. This poses the question of whether there is, in fact, a general construct of goal focus and we have simply not found the adequate method to assess it, or whether goal focus differs for different goals and goal types, and does not reflect a general construct. Given the inconsistencies within and across studies applying a variety of measures, we are tempted to conclude the latter. However, the nature of our data and analyses does not allow a final conclusion. In line with the heterogeneous pattern of results, we found little support for an association of goal focus and age, which fits well with the idea that there might not be a general goal focus. The results regarding the effect of goal complexity on goal focus are inconclusive and therefore do not allow conclusions on whether our stated hypothesis, the alternative hypothesis based on CLT, or none of them holds.

4.1. Broader implications

In our view, this study has important implications that go beyond the construct of goal focus. First, the low internal consistency of our items implies that motivational dimensions such as goal focus cannot be easily aggregated across goals. To the contrary, the specific goal (content) seems to be highly relevant for these dimensions and must be taken into account (this was also indicated by the variation in goal focus within goal domain). This is in line with the conclusions drawn by other authors (e.g., Milyavskaya & Werner, 2018; Nurmi et al., 2009). Accordingly, we recommend considering a large number of different goals in such assessments, instead of drawing inferences about person-related, general dispositions based on only a few selected goals. Alternatively, it also makes sense to pursue a multilevel approach (e.g., Nurmi et al., 2009).

Second, in a similar vein, due to the idiosyncratic nature of goals, it might be most adequate to assess goal dimensions for goals that the participants actually pursue. This would rule out that people represent hypothetical goals in different ways than goals they currently pursue. Note, that one challenge when providing participants with hypothetical goals is that they might leave open too much room for individual interpretation (e.g., "organizing a party" as a goal might be fun and very concrete for some and stressful and vague for others), or vary with regard to personal relevance. This might introduce further noise in the responses. It might be more fruitful to ask participants directly to think of goals varying in the dimensions under investigation (e.g., "*Please think of a personally very important (*vs. *less important) goal that is very concrete (*vs. *unclear) and positive (*vs. *stressful) for you*"). Finally, our results emphasize that the specific assessment method matters. Therefore, we recommend using multiple measures in order to gain a fuller picture and a better understanding of the construct of interest. By comparing multiple measures and testing their convergent, divergent, and if possible also their criterion-related validity, one gains an impression of the suitability of the different methods as well as how much noise they contain. Whether one method is better suited than another to assess a construct should be decided based on multiple aspects, not only different types of validity. For instance, also theoretical and pragmatic considerations should be taken into account, such as whether a certain method fits the conceptualization of the construct and whether it is feasible in the context of the study.

4.2. Limitations and future research

Although designed to overcome limitations of the previous studies, this study comes with a number of own limitations. For instance, in order to be able to systematically vary different goal dimensions, we had to ask participants for a number of personal goals and to provide them with a total of 16 hypothetical goals. This led to a quite extensive online study with a high demand on participants' time. This might have reduced their motivation and provoked certain response styles. Even though we included three quality check items in our survey, we cannot rule out that some of the participants responded randomly in order to finish the survey and receive the reimbursement. Also, we presented the tasks in a fixed order (i.e., first personal goals, then hypothetical goals; first simple, then complex goals; first two-statements task, then thinking exercise). Therefore, one might argue that the tasks presented first influenced the later tasks, and that fatigue was higher in later tasks, which we cannot control for. We chose to first ask about the personal goals to not influence participants' goal listings with the hypothetical goals we provided. Switching this order in half of the participants (i.e., counterbalancing), would not have made a lot of sense in our view because we could only have controlled whether the order influenced participants' goal focus, but not which goals they listed. Further, we did not have reason to assume that the order would influence participants' goal focus. Together with considerations regarding participants' motivation this made us decide for the fixed order.

In addition, our sample might be selective in that only adults who use the internet and are registered on Respondi could participate. However, to our knowledge, there is so far no evidence demonstrating that different age groups of online samples differ systematically from each other compared to lab-based samples. Additionally, also lab-based samples might attract specific groups of people (e.g., psychology students).

Furthermore, the sole use of relatively abstract self-report items might not reflect the participants' thoughts and behavior in everyday life. Then, despite including two different domains, one might argue that the goal contents were relatively narrow and might therefore not be representative for all goals. Note that we decided for these domains because they promised to be relevant across the lifespan, not only for a certain age group. Finally, our null findings need to be interpreted with caution as they cannot provide clear evidence for the non-existence of effects. Despite these limitations, we regard this study as an important step towards a better understanding of goal focus. Future research might extend these findings by investigating goal-specific goal focus and its relation to behavioral outcomes or by systematically investigating factors such as goal complexity in goals all of the participants pursue. In further investigations of goal complexity, it might be fruitful to explicitly consider and disentangle the difficulty and temporal extension of goal pursuit from complexity.

5. Conclusion

The findings of the current study suggest that goal focus is not a global, overarching construct that generalizes across different kinds of goals. Instead, the kind of goal as well as the method of assessment impact whether people report a stronger focus on the means or outcomes of a given goal. This also affected the association of goal focus with age that was found in previous studies. The differences between the findings of previous studies and the current study warrant future investigation in order to better understand under which circumstances and for which kinds of goals older adults focus more on the means than the ends of goals (Freund et al., 2019). Going beyond the construct of goal focus, we maintain that these findings are highly relevant for other motivational researchers in that they showcase challenges that likely apply also to other constructs such as approach and avoidance orientation. For this reason, we strongly encourage other goal researchers to apply a systematic multimethodological approach.

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Data Availability Statement

The data that support the findings of this study are openly available in OSF at https://osf.io/z68x2/?view_only=f3e9453665f240b6a00cb1400c1447b7.

Author contributions

Conceptualization: LM, MMD, ME, AMF. Data curation: LM. Formal analysis: LM, ME. Funding acquisition: LM, MMD, AMF. Investigation: LM. Methodology: LM, MMD, ME, AMF. Project administration: LM, MMD, ME, AMF. Resources: MMD, ME, AMF. Software: / Supervision: MMD, ME, AMF. Validation: /Visualization: LM. Writing - original draft: LM. Writing - review & editing: LM, MMD, ME, AMF.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data is available on OSF

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Appendix A. Supplementary data

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