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How to work out and avoid procrastination: The role of goal focus

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1 Running head: HOW TO WORK OUT AND AVOID PROCRASTINATION

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4 How to Work Out and Avoid Procrastination: The Role of Goal Focus

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9 Dynamics of Healthy Aging

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29

Conflict of Interest Statement

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The authors declare that they have no conflict of interest.

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Ethics Statement

33

The authors confirm that the manuscript adheres to the ethical guidelines specified

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in the APA Code of Conduct, the authors' national ethics guidelines, as well as the

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guidelines of the ethics committee of the Dept. of Psychology of the University of Zurich.

36

All participants gave their informed consent prior to their inclusion in the study.

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38

Abstract

39 This 8-week longitudinal experience sampling study with $N = 346$ participants ($n = 242$
40 completers) of a high-intensity interval training program explored how goal focus (i.e., a
41 focus on the process vs. outcome of goal pursuit) is related to procrastination and
42 successful goal pursuit. Specifically, the study investigated the association between goal
43 focus and participants' adherence to their workout plans (i.e., procrastination), their
44 immediate experience during the workout (e.g., pleasantness), and their intentions to
45 work out when they were procrastinating. Moreover, the study examined how process
46 and outcome focus are linked to overall goal achievement, workout satisfaction, and
47 objective fitness gains. Converging with previous research, results suggest that adopting a
48 process focus is adaptive. In addition, the analyses revealed some positive relationships
49 between outcome focus and immediate indicators of successful goal pursuit. However, in
50 contrast to process focus, outcome focus was not related to the overall measures and even
51 seemed maladaptive once people were procrastinating.

52 *Keywords:* procrastination, motivation, goal focus, goals, ecological momentary
53 assessment, exercise, high-intensity interval training

54 How to Work Out and Avoid Procrastination: The Role of Goal Focus
55 Despite the best of intentions, many people struggle to keep to the physical exercise
56 routine they have set for themselves (Iso-Ahola, 2013). In other words, they know what
57 to do (e.g., how to perform a push-up), plan to do it (e.g., do three sets of push-ups four
58 times a week in the evening), but do not follow through. This intention-behavior gap has
59 been described as the core of the self-regulatory problem of procrastination (Lay, 1986;
60 Steel, 2007). Procrastination is associated with a host of factors including personality
61 traits, the proximity of temptation, impulsiveness, and task characteristics (for an
62 overview, see Rozental & Carlbring, 2014). Motivational accounts of procrastination and
63 health behavior focusing on such personal or situational factors often make reference to
64 the construct of goals as one of the central constructs in motivation research (e.g., Locke
65 & Latham, 1990). However, the question of which cognitive representations of goals
66 might be related to procrastination has been largely neglected (cf. Blunt & Pychyl, 2005).
67 Using the sample case of the goal to work out regularly, the research reported here sought
68 to extend previous research by exploring the role of *goal focus* for procrastination, the
69 experience of working out, as well as objective improvement (i.e., fitness gains) and goal
70 achievement.

71 **Procrastination of Health Behaviors**

72 A substantial number of people find it difficult – and do not succeed – to stick to
73 their exercise intentions (Bocksnick, 2004; King et al., 1997), often by procrastinating
74 their workout routines. Yet, procrastination research has neglected this important topic
75 and largely restricted itself to the academic domain (Lay, 1986; Schouwenburg & Lay,
76 1995; Steel, 2007). In fact, in addition to academic procrastination, this self-regulatory

77 problem can creep into every aspect of everyday life whenever people plan actions (e.g.,
78 to answer an email or to work out), as situational predictors of procrastination (e.g.,
79 tempting distractors) occur in many different contexts. The frequency of procrastination
80 is also reflected in the finding that every fifth person of the general population self-
81 identifies as a chronic or trait procrastinator (e.g., Ferrari, O’Callaghan, & Newbegin,
82 2005; Harriott & Ferrari, 1996).

83 Trait procrastination is related to stress and the delay or omission of health and
84 wellness behaviors such as exercising (Sirois, Melia-Gordon, & Pychyl, 2003).
85 Indubitably, missing one workout session now and then is unlikely to negatively affect
86 health, but it can be the start of the slippery slope to a habit of procrastinating and
87 missing out on exercising on a more regular basis or disengaging from it entirely. When
88 procrastination is recurring, it can slow down goal progress, prevent people from
89 achieving their goals, and negatively impact subjective well-being and health (Kroese &
90 De Ridder, 2016; Steel, 2007; Sirois & Pychyl, 2016).

91 **Predictors of Exercising Behavior and Interindividual Differences**

92 Whether people engage in physical activity or not is a complex behavioral process
93 influenced by social, personal, and environmental factors (Pan et al., 2009). For instance,
94 people are more likely to exercise when they enjoy physical activity, are highly
95 motivated, and in a good mood. In contrast, factors such as workout difficulty (e.g., low
96 self-efficacy) are negatively associated with physical activity (Troost, Owen, Bauman,
97 Sallis, & Brown, 2002) and positively with procrastination (Sirois, 2004). Self-efficacy is
98 generally related to positive outcome expectancies (e.g., “If I work out four times a week,
99 I will become more muscular”), which, in turn, contribute to the forming of intentions to

100 exercise (Schwarzer, Luszczynska, Ziegelmann, Scholz, & Lippke, 2008). However, this
101 does not imply that conscious deliberations are always necessary; nonconscious processes
102 (e.g., triggered by situational cues) may facilitate (or hinder) regular exercise as well (for
103 an overview, see Iso-Ahola, 2017). Importantly, self-regulatory skills and strategies are
104 paramount for establishing and maintaining a workout routine (e.g., Sniehotta, Scholz, &
105 Schwarzer, 2005).

106 Even if people follow the same exercise schedule, they will not all improve to the
107 same extent. The degree of objective fitness improvement (e.g., improved endurance) will
108 depend on a plethora of factors including training-specific behavior such as training
109 intensity (González-Badillo, Izquierdo, & Gorostiaga, 2006). Similarly, people may
110 pursue other goals with their workout than objective fitness improvement and not be
111 equally satisfied with their goal progress. Both their exercise satisfaction (e.g., Unger &
112 Johnson, 1995) and the attainment of different exercise-related goals (e.g., Gyurcsik,
113 Estabrooks, & Frahm-Templar, 2003) depend on different factors such as goal specificity
114 and difficulty (Locke & Latham, 1990). Therefore, finding factors that are not only
115 related to procrastination versus adherence to exercise plans but also subjective (e.g.,
116 mood) and objective (i.e., physical fitness gains) indicators of personal improvement,
117 goal progress, and goal achievement over time, will be fruitful to develop specific
118 interventions that might help people to stick to their plans and reach the goals they set for
119 themselves. In this research, we examine one such potential predictor of different facets
120 of successful goal pursuit in the fitness context, namely goal focus.

121 **The Role of Goal Focus for Health Behaviors and Procrastination**

122 Goals can be defined as subjectively desirable states that a person intends to attain
123 through action (Kruglanski, 1996). Like every goal, the goal to exercise regularly
124 comprises desired outcomes (e.g., improve attractiveness or health) and means to achieve
125 these outcomes (e.g., to follow a certain workout routine). However, people may differ
126 (among each other and across different goals or situations) in their goal focus, that is, in
127 the extent to which they focus on the process or means of goal pursuit (i.e., *process focus*)
128 and/or the consequences (i.e., *outcome focus*; Freund, Hennecke, & Mustafic, 2012;
129 Freund, Hennecke, & Riediger, 2010; Sansone & Thoman, 2005; Vallacher & Wegner,
130 1987).¹

131 Previous research suggests that inter- and intraindividual differences in goal focus
132 are related to successful goal pursuit in the domain of health behavior. In a 6-week
133 longitudinal study with overweight women, Freund and Hennecke (2012) found that,
134 despite an overall positive correlation between process and outcome focus, focusing on
135 the means rather than the desired outcomes of a low-calorie diet is positively related to
136 weight loss. The authors argued that a focus on the process might be associated with a
137 vigilant monitoring of one's goal-related behaviors, whereas focusing on the outcome
138 might even distract from good opportunities to implement goal-relevant means (see also
139 Oettingen, 1996). Fishbach and Choi (2012) demonstrated that thinking about outcomes
140 renders the experience of practicing yoga less positive and undermines goal pursuit more
141 than focusing on the experience itself (i.e., the process). Similarly, in a study by Freund,
142 Hennecke, and Riediger (2010), process focus but not outcome focus was positively
143 associated with self-reported exercise frequency, regularity, importance, and positive

144 affect. In addition, process focus longitudinally contributed to an increase in positive goal
145 evaluations such as goal satisfaction, involvement, or subjective closeness to the goal.
146 Although Pham and Taylor (1999) also found evidence that supports the superiority of a
147 process focus, in this case in the academic domain, they reported that the combination of
148 a high process and outcome focus was more beneficial for motivation than process focus
149 alone.

150 There are currently no studies in the sports domain that investigate the relationship
151 between goal focus and procrastination. However, referring to procrastination, Krause
152 and Freund (2016) found that process focus is negatively linked to procrastination in the
153 academic context. The authors describe several reasons why this may be the case. For
154 example, people who focus more on the process may experience a higher positive affect
155 (Freund et al., 2010), which is an important positive reinforcer in long-term goal pursuit
156 and draws the attention away from the negative discrepancy between the actual (e.g., not
157 being muscular) and the desired state (e.g., being muscular). In addition, Krause and
158 Freund found that a higher process focus reduced fear of failure and task aversiveness,
159 two factors which are often associated with procrastination.

160 Taken together, the results of these studies on goal focus suggest that adopting a
161 process focus might also be more beneficial than adopting an outcome focus with regard
162 to both adherence to exercise plans (vs. procrastination) and goal achievement in the
163 sports domain. More specifically, we are interested in the unique and, following Pham
164 and Taylor (1999), also the potential additive effects of process and outcome focus on the
165 experience of working out, different goal-related outcomes, and procrastination (i.e.,
166 when controlling for the effect of the other focus). The unique contribution of the

167 research reported here is that it explored both short- and long-term correlates of goal
168 focus at the time when people had either been working out as planned or procrastinating.
169 This is an improvement over the procedure in Freund and Hennecke's (2012) study in
170 which participants reported their behavior and affective well-being (e.g., mood) only
171 retrospectively for the past week. Similarly, the longitudinal study by Freund et al. (2010)
172 consisted of only two assessment sessions with an interim of about 4 months, which did
173 not allow for fine-grained analyses of goal focus and its consequences.

174 **The Present Study**

175 To address the shortcomings of previous studies, we conducted an experience
176 sampling study of participants who all shared the goal of starting an exercise regimen of
177 working out four times per week in a high intensity interval training program. This
178 allowed us to investigate the association of goal focus with procrastination (vs.
179 successfully following the intended workout schedule) and related correlates. The study
180 involved 32 measurement points over eight weeks between a pre- and post-study fitness
181 test. Overall, we hypothesized that process focus is (a) adaptive, and (b) a more relevant
182 predictor than outcome focus for successful goal pursuit. Specifically, we hypothesized
183 that the higher the process focus, the lower the probability to procrastinate (vs. working
184 out). Moreover, exploring the immediate correlates of goal focus, we reasoned that
185 people with a higher process focus perceive the workout as more important, more
186 pleasant, and less difficult. In addition, we expected participants to report a better mood,
187 higher workout motivation, and higher confidence to achieve their workout-related goals.
188 Concerning instances in which people procrastinated on working out, we explored
189 whether goal focus is related to what they intended to do next (i.e., keep procrastinating

190 or start with the workout). Finally, we hypothesized that, at the end of the eight-week
191 period of this study, people with a higher average process focus during the workout have
192 fewer total procrastination episodes, are more likely to achieve their personal workout-
193 related goals, and report a higher overall workout satisfaction. Additionally, their fitness
194 should also objectively improve more (i.e., higher physical fitness gains in a fitness test)
195 when they focus more on the process.

196 **Methods**

197 **Sample**

198 The study targeted adults intending to follow a new workout routine consisting of
199 four weekly workout sessions at home over a period of eight weeks. Participants were
200 recruited via advertisements on Internet forums (e.g., University of Zurich students'
201 forums) and the participant pool of the Department of Psychology at the University of
202 Zurich. The advertisements included a link to a first online questionnaire, which was
203 created and published using an online questionnaire tool (SoSci Survey;
204 www.soscisurvey.de).

205 The original sample consisted of $N = 346$ participants (65% female) aged 18 to 65
206 years ($M = 32.35$, $SD = 11.21$) who attended a pre-study fitness test. As might be
207 expected, there was a substantial number of dropouts who ultimately decided not to
208 participate for the full eight weeks in this demanding study, resulting in a sample of $n =$
209 242 (64% female, aged 18 to 63 years, $M = 33.15$, $SD = 11.57$) at the end of the eight-
210 week period.

211 As for highest level of education completed, 2.3% of the participants reported
212 having completed compulsory education/lower secondary education, 45.1% upper

213 secondary level education (vocational education, baccalaureate school, or upper
214 secondary specialized schools), 50.3% a university degree, and 2.3% other degrees. Most
215 participants were employed (76.4%) or students (17.8%). A large majority of the
216 participants (88.7%) had not participated in a physical training program before.

217 **Procedure**

218 Figure 1 indicates when the most relevant constructs were assessed in the study.
219 Participants first filled out a health screening questionnaire, which consisted of the
220 somatization subscale of the SCL-90-R (Derogatis, 1977; Franke, 1995), an indication of
221 number of repetitions in a one-minute sit-to-stand test (Bohannon, Bubela, Magasi,
222 Wang, & Gershon, 2010), various questions on cardiovascular health (e.g., high blood
223 pressure), and an open question on existing health issues. We did not allow people to
224 enter the study if they reported a sum score greater than 30 on the SCL-90-R, less than 20
225 repetitions in the sit-to-stand test, any cardiovascular diseases, or a condition that might
226 pose a risk to the participants (e.g., pregnancy).

227 **Instructions, pre-study fitness test, and baseline questionnaire.** After the
228 screening questionnaire, participants had an appointment with a certified fitness instructor
229 and a student assistant in a gym in groups of up to five participants. The fitness instructor
230 showed them the workout routine consisting of a high-intensity interval training of four
231 sets of eight different exercises (i.e., jumping jack, jumping sideways, lunge, push-up,
232 swimmer, plank, sit-up, and high knees). This workout does not require any prior
233 knowledge about physical exercises, no specific fitness level, nor any equipment. It can
234 be performed at any location and without supervision of an instructor beyond the initial
235 face-to-face session. The workout alternates between 20 second periods of intense

236 exercise with 10 second recovery periods. Four workout sets are considered one workout
237 session and take 16 minutes. The instructor showed the participants one set, asked them
238 to do the exercises, and corrected them if necessary. Subsequently, the objective
239 measures were assessed: Half of the participants stayed with the instructor to take a pre-
240 study fitness test consisting of four different exercises (i.e., hold a plank and squat
241 position for as long as possible, perform as many high knees as possible within one
242 minute, and perform as many push-ups as possible without a break). The other half went
243 one by one to a separate room, where the student assistant assessed various physical
244 measures on an electronic scale (e.g., body fat). However, because of reliability issues
245 with the scale, we did not consider these values for the analyses. Finally, the two groups
246 of participants switched.

247 Participants received a link to a video with the full workout routine, which they
248 could access at any time. They were asked to do one workout practice session at home
249 and subsequently received a baseline questionnaire. In this questionnaire, participants
250 responded to basic demographic questions and filled out an adapted version of the Pure
251 Procrastination Scale which measures trait procrastination (Steel, 2010; German version
252 see Krause & Freund, 2014; from the original scale consisting of twelve items, two items
253 referring to decisional procrastination were omitted as this aspect of procrastination was
254 not considered in this study, where participants started after having decided on the goal to
255 exercise regularly). Participants also specified which workout-related goals they wanted
256 to achieve with the workout. In addition, the questionnaire included different scales not
257 relevant for this paper (e.g., ratings regarding different activities). Finally, participants
258 indicated four weekly time windows of one hour in which they planned to do the

259 exercises. They could change their time windows over the course of the study but were
260 asked to provide us with the new time windows at least one day before the desired change
261 to avoid short-term changes in plans characteristic for procrastination.

262 **Questionnaires during workout windows.** Starting eight weeks before the week
263 in which the post-study fitness test took place, each participant received a questionnaire
264 four times a week on the indicated workout day at the end of the indicated time window
265 followed by an SMS prompt. Participants were asked to fill out the questionnaire as soon
266 as possible and no later than 15 minutes after the prompt. In this questionnaire,
267 participants indicated what they had been doing. When they responded that they had been
268 working out, their goal focus was assessed with regard to the workout. When they
269 responded that they had not been working out, they were asked what they had been doing
270 instead and to rate their goal focus with regard to that activity. Moreover, participants
271 rated the indicated activity regarding different characteristics (e.g., importance,
272 pleasantness, difficulty), and filled out other measures such as mood.

273 **Post-study fitness test and final questionnaire.** Participants filled out weekly
274 questionnaires not relevant for the present study. At the end of the study, participants did
275 a post-study fitness test in the gym, which was identical to the pre-test. They then
276 completed a final questionnaire, in which they evaluated the past weeks on various
277 dimensions (e.g., overall satisfaction with workout and achievement of personal goals).

278 As a way of compensation for participation, participants who filled out at least 50%
279 of all questionnaires ($n = 184$) received a comprehensive individualized written feedback.
280 In addition, they were given a voucher for free entrance to the gym, in which the

281 instructions had taken place. Participants who filled out less than 50% of all
282 questionnaires ($n = 58$) received a less detailed feedback and the voucher.

283 **Response Rate and Data Handling**

284 Overall, we sent out a total of 8,957 questionnaires during planned workout
285 windows, of which 53.2% (4,766) were completed in time (i.e., within 15 minutes) with
286 an average response time of 5.22 minutes ($SD = 3.52$ min), 19.1% (1,707) too late with an
287 average response time of 370.47 minutes ($SD = 628.75$ min), and 27.7% (2,484) were not
288 filled out at all. Results did not change substantially when including in the analyses
289 questionnaires that were filled out too late. Therefore, we used all available data to
290 increase the reliability of the results without biasing them.

291 Except for the overall analyses for which we only had data from completers, we
292 included all available data at each point in time, including that of the $n = 104$ participants
293 who dropped out over the course of the study. On average, the dropouts stayed in the
294 training program for about half of the study ($M = 16.52$ measurement occasions, $SD =$
295 10.89).

296 **Measures**

297 **Goal focus.** To assess goal focus during the workout window, the participants
298 answered the following questions on a 7-point Likert-type scale ranging from 1 (*not at*
299 *all*) to 7 (*very much*): “To what extent were you focusing on what you want to achieve
300 with the workout?” (i.e., outcome focus) and “To what extent were you focusing on the
301 workout itself?” (i.e., process focus). The items have high face validity and are
302 commonly used to assess goal focus (e.g., Freund & Hennecke, 2012; Hennecke,
303 Czikmanti, & Brandstätter, 2019). If the participants did not work out, they indicated

304 what they were doing and rated goal focus regarding the indicated activity. Most of the
305 alternative activities fell into the categories relaxing/sleeping ($n = 297$), eating/cooking (n
306 $= 218$), working ($n = 201$), meeting friends/family ($n = 180$), and being on the way ($n =$
307 179). The remaining 20 categories were mentioned less than 132 times.

308 **Activity characteristics.** Participants rated the importance (“How important was
309 this activity?”), pleasantness, and difficulty of the workout, as well as how motivated
310 they were to work out on a 7-point Likert-type scale ranging from 1 (not at all) to 7 (very
311 much). Their confidence to achieve their personal workout-related goals was assessed on
312 a scale from 0 (not at all) to 100 (very much) using a continuous slider and afterwards
313 rescaled to have the same range as the other continuous variables (i.e., 1 to 7).

314 **Mood.** Mood was assessed with the “good-bad mood” subscale from the German
315 version of the Multidimensional Mood State Questionnaire (MDBF; Steyer,
316 Schwenkmezger, Notz, & Eid, 1997). This subscale consists of four items (i.e., “content,”
317 “good,” “bad,” “unwell;” Cronbach's $\alpha = .75$). Participants indicated how much they had
318 felt these affects at the moment on a 7-point Likert scale from 1 (not at all) to 7 (very
319 much). The items “bad” and “unwell” were reverse coded before the subscale was created
320 by dividing the sum score by 4 to obtain a 1-7 subscale score as for the other variables.
321 Higher values indicate better mood.

322 **Behavioral intentions during procrastination episodes.** If participants indicated
323 that they had not worked out during the chosen time windows, they were asked what they
324 intended to do after completing the questionnaire. The options were: (1) “Keep doing
325 what I was doing,” (2) “work out,” and (3) “something else.” The first and third category

326 were collapsed into a “no workout” category (coded with 0; the “work out” category was
327 coded with 1).

328 **Goal achievement and workout satisfaction.** At the end of the study, participants
329 indicated whether they had achieved their personal workout-related goals (0 = not
330 achieved/no longer achievable, 1 = achieved). In addition, they rated their overall
331 workout satisfaction on a 7-point Likert-type scale ranging from 1 (not at all) to 7 (very
332 much).

333 **Objective measures.** To obtain a score for the improvement in the four test
334 exercises (i.e., plank, push-ups, squat, high knees) over the workout period, the pre-test
335 fitness scores were subtracted from the post-test scores (i.e., positive values indicate
336 improvement).

337 **Statistical analyses**

338 To investigate the effects of goal focus while participants had been working out or
339 procrastinating, we applied multilevel analyses. We followed the procedure
340 recommended by Bolger and Laurenceau (2013) to partition the predictors into their
341 constituent between-subjects (between process focus/between outcome focus) and within-
342 subjects (within process focus/within outcome focus) components. We also considered
343 possible interactions between the two foci at both levels of analysis (i.e., within- and
344 between-subjects interaction) except for the prediction of the current activity where a
345 model with an interaction did not converge. Although we were not interested in time
346 trends, we included the centered week number as a fixed effect in the model to control for
347 potential effects of time, as suggested by Bolger and Laurenceau (2013). The multilevel

348 analyses allowed a random intercept as well as random slopes for each of the two foci
349 and (with the mentioned exception) their interaction at the within-person level.

350 Multilevel analyses were conducted with R (Version 3.5.0; R Core Team, 2018),
351 using the nlme and lme4 packages (Bates et al., 2018; Pinheiro, Bates, DebRoy, Sarkar,
352 & R Core Team, 2018). We calculated a likelihood-ratio based adjusted pseudo R^2 for
353 each model as implemented in the MuMIn package (Bartoń, 2018). This statistic offers
354 the proportion of the variance explained by comparing models including the explanatory
355 variables with models without them.² All other analyses were conducted with SPSS (IBM
356 Corp., 2013).³

357 **Results**

358 **Preliminary Analyses**

359 Some participants showed almost no variance regarding procrastination over the
360 course of the study (i.e., they worked out or procrastinated in fewer than 2 out of 32
361 cases). The data of these participants could not contribute to the estimation of within-
362 person changes. Overall, the multilevel analyses were conducted on 4,484 observations
363 (i.e., importance, pleasantness, motivation, difficulty) or 4,481 observations (i.e., mood
364 and confidence) from 325 participants for the workout episodes and 1,958 observations
365 from 299 participants for the procrastination episodes. For the prediction of participants'
366 current activity, 6,462 observations from 336 participants were available.

367 Trait procrastination measured at baseline negatively predicted how many workout
368 sessions people did at times they had planned to do so, both when considering all
369 participants, $\beta = -.22$, $t(334) = -4.09$, $p < .001$, and when considering completers only, $\beta =$
370 $-.22$, $t(240) = -3.46$, $p < .001$. This result can be interpreted as supporting our

371 operationalization of procrastination as not working out within the indicated time
372 windows.

373 Outcome and process focus correlated positively during both workout, $r = .32$, $p <$
374 $.001$, and procrastination episodes, $r = .41$, $p < .001$. To assess possible multicollinearity
375 in all analyses, we used Frank's (2011) `mer-utils.R` function for the multilevel models and
376 the collinearity diagnostics integrated in SPSS for all other analyses (i.e., total number of
377 procrastination episodes, overall measures, and objective measures). The predictors'
378 variance inflation factors were all in the range of 1.02 to 1.81, indicating that
379 multicollinearity was not a concern.

380 **Immediate Correlates of Goal Focus**

381 **Current activity.** To investigate how current goal focus was related to whether
382 participants were working out within the planned workout windows or procrastinating
383 (i.e., doing something else), we fitted a generalized linear mixed-effects model (GLMM,
384 logit link and binomial errors) to the binary outcome variable (0 = procrastinating; 1 =
385 working out). The analysis revealed a significant intercept, $B = -2.08$, $SE = 0.31$, $z = -$
386 6.64 , $p < .001$, 95% CI [-2.70, -1.48], a significant time effect,⁴ $B = -0.31$, $SE = 0.02$, $z = -$
387 13.36 , $p < .001$, 95% CI [-0.36, -0.27], and significant positive effects of both process, B
388 $= 0.33$, $SE = 0.06$, $z = 5.73$, $p < .001$, 95% CI [0.22, 0.44], and outcome focus, $B = 0.32$,
389 $SE = 0.05$, $z = 6.84$, $p < .001$, 95% CI [0.23, 0.41]. Translated to changes in odds, the goal
390 focus effects indicate that for a one-unit increase in process focus (outcome focus), the
391 increase in the odds of working out was 39% (37%) when holding outcome focus
392 (process focus) constant. In other words, the participants generally reported to be more

393 goal focused when they worked out compared to being engaged in alternative activities.
394 The overall goodness of fit (adjusted pseudo- R^2) of the model was .25.

395 **Experience of the workout.** Next, multilevel analyses were conducted to examine
396 how goal focus is related to participants' experience of the workout on various
397 dimensions during the workout. Bivariate correlations between these dimensions as well
398 as the descriptive statistics are displayed in Table 1.

399 The multilevel analyses with importance, pleasantness, and motivation as
400 dependent variables revealed significant main effects for process and outcome focus at
401 the within- and between-person level (see Table 2). Specifically, both process and
402 outcome focus were positively related to the perceived importance and pleasantness of
403 the workout, as well as participants' motivation: the higher the process focus on a given
404 day, the more important and pleasant the workout was to participants, and the more
405 motivated they were to work out (within-person effects). The same was true for outcome
406 focus, thus suggesting that a stronger than (individual) average focus on either aspect of
407 the exercise goal, be it on the means or the outcome, is positively linked to the perceived
408 importance of this goal, the enjoyment of goal pursuit, and participants' motivation.
409 However, for pleasantness and motivation, the effect of process focus was stronger than
410 the one of outcome focus.

411 In addition, participants who focused on average more on the process reported the
412 workout to be more important and were more motivated to work out (between-person
413 effects). The same was true when participants focused more on the outcome. Regarding
414 the magnitude of the effects, average process (vs. outcome) focus was more strongly
415 related to participants' motivation, thus mimicking the within-person effects. In contrast,

416 interindividually higher levels of outcome (vs. process) focus were more strongly
417 associated with the perceived importance of the workout. Moreover, only average process
418 focus was positively related to the perceived pleasantness of the workout, whereas
419 average outcome focus was not (Table 2). The multilevel analyses for the prediction of
420 participants' mood and their confidence to achieve their workout-related goals revealed a
421 similar pattern as for pleasantness (see Table 3). Specifically, it was mainly (for mood) or
422 only process focus (for confidence) both at the within- and between-person level that was
423 positively related to participants' mood and confidence (see Table 3).

424 Regarding difficulty, the results revealed effects particularly at the between-person
425 level (Table 3). Specifically, participants with a higher average process focus than other
426 participants perceived the workout as less difficult. This effect was more pronounced
427 when people also focused more on the outcome (between-person interaction). In contrast,
428 outcome focus was positively related to how participants perceived the workout in terms
429 of difficulty at the within-person level. That is, on days on which they focused more on
430 the outcome, they perceived the workout as slightly more difficult.

431 **Behavioral intentions during procrastination episodes.** When participants were
432 procrastinating, they were asked what they intended to do after completing the
433 questionnaire. In $n = 260$ cases, they indicated that they intend to start with the workout.
434 In $n = 1698$ cases, they intended to keep doing what they were doing or to do something
435 else. We fitted a GLMM (logit link and binomial errors) to the binary outcome variable
436 (0 = something else than working out; 1 = working out) and entered process focus,
437 outcome focus, and their interaction regarding the current activity as predictors to the
438 model (controlling for time; adjusted pseudo- $R^2 = .07$). The analysis revealed a

439 significant intercept, $B = -2.74$, $SE = 0.20$, $z = -13.56$, $p < .001$, 95% CI [-4.09, -2.51], a
440 significant time effect,⁴ $B = -0.32$, $SE = 0.05$, $z = -6.11$, $p < .001$, 95% CI [-0.47, -0.20], a
441 significant positive effect of process focus at the between-person level, $B = 0.29$, $SE =$
442 0.11 , $z = 2.59$, $p = .010$, 95% CI [0.09, 0.52], and an interaction between process and
443 outcome focus at the between-person level, $B = -0.19$, $SE = 0.06$, $z = -3.11$, $p = .002$, 95%
444 CI [-0.29, -0.02]. Translated to changes in odds, the main effect for process focus
445 indicates that for a one-unit increase in average process focus, the increase in the odds of
446 the intention to work out instead of doing something else was 34% when holding all other
447 predictors constant. However, an increase in outcome focus attenuated this effect
448 (between-person interaction). For example, for an average process focus of 2 and an
449 average outcome focus of 1, the increase in the odds of the intention to work out would
450 be 48%, whereas for an average process focus of 2 and average outcome focus of 3 it
451 would be only 1%.

452 Thus, taken together, the analyses of the immediate correlates of goal focus in
453 workout and procrastination episodes confirmed our hypothesis that a process focus is
454 adaptive. Moreover, regarding most of the dimensions, process (vs. outcome) focus was a
455 stronger predictor. Next, we address the overall and more long-term correlates of goal
456 focus.

457 **Long-Term Correlates of Goal Focus**

458 Interactions between process and outcome focus were largely absent in the previous
459 analyses. As we did not expect any interactions, we included only main effects of process
460 and outcome focus in the subsequent analyses.

461 **Number of workout sessions.** First, a multiple linear regression was performed to
462 test whether average process and outcome focus during workout predicted the total
463 number of completed workout sessions within the planned workout windows (i.e., fewer
464 procrastination episodes). The analysis of data from participants who completed the study
465 revealed that process focus positively predicted the number of workout sessions, $B =$
466 1.14 , $SE B = 0.52$, $\beta = 0.15$, $p = .030$, 95% CI [0.16, 2.13], whereas outcome focus did
467 not, $B = -0.23$, $SE B = 0.44$, $\beta = -0.04$, $p = .605$, 95% CI [-1.23, 0.71]; intercept: $B =$
468 12.56 , $SE B = 2.66$, $p < .001$, 95% CI [6.39, 18.19]; adjusted $R^2 = .012$, $F(2,235) = 2.43$,
469 $p = .090$.⁵ Given the relationship between process focus and the number of workout
470 sessions, the following analyses controlled for the number of workout sessions. This was
471 also because we expected the number of completed workout sessions to be related to the
472 outcomes assessed in the final questionnaire and post-study fitness test.

473 **Goal achievement.** At the beginning of the study, participants specified a goal they
474 wanted to achieve with the workout by the end of the study. In the final questionnaire, $n =$
475 135 participants indicated that they had achieved their personal goal, whereas $n = 107$ had
476 not. We conducted a logistic regression with this binary outcome (0 = goal not
477 achieved/no longer achievable; 1 = goal achieved). In a first step, we entered the number
478 of workouts in the regression model. The analysis revealed that participants who
479 completed more workout sessions within the indicated time windows were also more
480 likely to achieve their goals, $B = 0.11$, $SE = 0.02$, Wald(1) = 31.63, $p < .001$, 95% CI
481 [0.07, 0.15]; $\chi^2 = 37.63$, $p < .001$ with $df = 1$, McFadden $R^2 = 0.11$. Next, average process
482 and outcome during workout were added as predictors. McFadden R^2 indicated that the
483 predictors were able to account for 14% of the variability in the outcome, $\chi^2 = 40.74$, $p <$

484 .001 with $df = 3$. Specifically, the number of completed workout sessions still
485 significantly predicted whether participants achieved their personal goals, $B = 0.11$, $SE =$
486 0.02 , $Wald(1) = 29.72$, $p < .001$, 95% CI [0.07, 0.15]. However, average process focus
487 during workout only marginally predicted personal goal achievement, $B = 0.25$, $SE =$
488 0.14 , $Wald(1) = 2.89$, $p = .089$, 95% CI [-0.07, 0.56]: A one-unit increase in average
489 process focus was associated with an increase in the odds of achieving the personal goal
490 by 28% when holding all other predictors constant. Average outcome focus did not
491 predict whether participants achieved their goals or not, $B = -0.12$, $SE = 0.12$, $Wald(1) =$
492 0.99 , $p = .32$, 95% CI [-0.39, 0.13]; intercept: $B = -2.16$, $SE = 0.79$, $Wald(1) = 7.55$, $p =$
493 $.006$, 95% CI [-3.81, -0.70].⁶

494 **Workout satisfaction.** A multiple linear regression was conducted to investigate
495 whether average process and outcome during workout were significantly related to
496 participants' overall workout satisfaction over and above the effect of number of
497 completed workout sessions. In a first step, the number of workouts was entered into the
498 regression model. Participants who completed more workout sessions reported a higher
499 workout satisfaction, $B = 0.12$, $SE B = 0.01$, $\beta = 0.61$, $p < .001$, 95% CI [0.10, 0.14];
500 adjusted $R^2 = .37$, $F(1,236) = 138.23$, $p < .001$. Next, the two goal focus variables were
501 added to the model. The linear combination of the three predictors was significantly
502 related to overall workout satisfaction, adjusted $R^2 = .41$, $F(3,234) = 56.82$, $p < .001$.
503 Specifically, the number of workout sessions, $B = 0.11$, $SE B = 0.01$, $\beta = 0.58$, $p < .001$,
504 95% CI [0.09, 0.13], and average process focus during workout, $B = 0.35$, $SE B = 0.08$, β
505 $= 0.24$, $p < .001$, 95% CI [0.19, 0.51], were positively associated with workout
506 satisfaction. In contrast, average outcome focus was not related to workout satisfaction, B

507 = -0.03, $SE B = 0.07$, $\beta = -0.03$, $p = .63$, 95% CI [-0.16, 0.10]; intercept: $B = 1.21$, $SE B =$
508 0.41 , $p = .004$, 95% CI [0.34, 2.12].

509 **Fitness gains.** Regarding the four objective measures (i.e., plank, squat, push-ups,
510 high knees) assessed in the pre- and post-study fitness test, we conducted four
511 hierarchical multiple linear regressions to investigate whether average process and
512 outcome focus during workout predicted personal pre-post improvement over and above
513 the number of workout sessions. The results displayed in Tables 4 (i.e., plank and squat)
514 and 5 (i.e., push-ups and high knees) indicate that the participants improved in all four
515 exercises. However, significant effects of average goal focus were only found for the
516 improvement in push-ups. Specifically, the more participants on average focused on the
517 process of the workout, the more they improved (over and above the significant positive
518 effect of the number of workout sessions).

519 **Discussion**

520 The current research explored the association between goal focus and people's
521 procrastination (here: adherence to workout plans). Both a higher process and outcome
522 focus on the current activity were linked to an increased likelihood that people actually
523 worked out at times they had planned to do so. However, only the average process focus
524 during the workout predicted the total number of workout sessions at the end of the study.
525 Moreover, this study examined how goal focus is related to how people experience the
526 workout in real time and to different workout-related outcomes. Both process and
527 outcome focus had unique positive associations with the perceived importance and
528 pleasantness of the workout, and were also each related to participants' motivation and
529 mood. However, whereas participants perceived the workout as more difficult on days on

530 which they focused more on the outcome of the workout, a higher average process focus
531 was negatively related to perceived difficulty. The effect of process focus was stronger in
532 combination with a higher average outcome focus, suggesting that the adaptiveness of
533 outcome focus depends on the level of analysis, i.e., whether one is interested in *intra-* or
534 *interindividual* differences. Moreover, only process focus was related to participants'
535 confidence to achieve their desired outcomes. Thus, somewhat ironically, the more
536 people focus on *how* they work out, the more confident they are that they will get to their
537 outcomes. In fact, participants with a higher process focus during the workout than other
538 participants were more likely to achieve their goals and reported a significantly higher
539 overall workout satisfaction at the end of the study. In contrast, outcome focus was
540 unrelated to either of these outcomes.

541 The findings of this study match with previously reported positive effects of
542 adopting a process focus (e.g., Freund & Hennecke, 2012; Freund et al., 2010; Hennecke
543 & Freund, 2014). Regarding the goal to start working out regularly, Freund et al. (2010)
544 had found that process focus was positively related to positive affect, increased
545 attainability, importance, and satisfaction as well as higher goal involvement over a
546 period of four months. Process focus was also positively related to different measures of
547 goal pursuit (self-reported exercise frequency and regularity). However, their study
548 consisted of only two measurement occasions and the measures were not obtained while
549 participants were exercising. The current experience sampling study thus extends
550 previous research by pointing to more immediate positive correlates of process focus on
551 workout evaluation, mood, and motivation.

552 The finding that outcome focus was irrelevant regarding the number of workout
553 episodes, goal achievement, workout satisfaction, and objective improvement is also
554 consistent with the study of Freund et al. (2010). These authors found that outcome focus
555 was not or even negatively related to positive evaluations of the goal and goal pursuit. In
556 contrast, however, regarding the more immediate measures, the results of the current
557 experience sampling study do not support the idea that outcome focus is maladaptive.
558 Although our study corroborates the relative superiority of process over outcome focus, a
559 higher outcome focus was particularly adaptive regarding the perceived importance of the
560 workout and participants' motivation.

561 **The Adaptiveness of Process and Outcome Focus**

562 The adaptiveness of both process and outcome focus is in line with a study by Pham
563 and Taylor (1999) showing that focusing on both process and outcome is more beneficial
564 for motivation than focusing on the process only. Furthermore, our findings also fit
565 results from research on mental contrasting (e.g., Adriaanse et al., 2010). In mental
566 contrasting, both the positive outcome people want to achieve in the future and the
567 negative reality become mentally accessible and they form a strong mental association. It
568 has been argued that mental contrasting aids the identification of obstacles or critical
569 cues. Thus, this strategy entails both a focus on the outcome (i.e., the desired future) and
570 parts of the process (i.e., identification of obstacles and critical cues) of goal pursuit.
571 Importantly, in the current study, the effects of process and outcome focus were
572 simultaneously estimated. Therefore, significant effects of each of the two foci can be
573 interpreted as explaining variance over and above the effect of the other respective focus.
574 Together with the virtual absence of interactions, our findings favor additive over

575 synergistic effects of the two foci. As Little (1989) pointed out, people do not only want
576 to know why they are doing something but also what they should be doing. Thus, it
577 seems that focusing one's attention to both aspects of a goal may be adaptive. Note, that
578 process and outcome focus correlated positively with each other during workout sessions
579 ($r = .32, p < .001$). Nevertheless, the wide range of correlations reported in previous
580 studies from non-significant ($r = .07$; Freund et al., 2010) to large effects ($r = .70, p <$
581 $.001$; Freund & Hennecke, 2012) calls for further exploration of moderators of this
582 association. For example, Freund and Hennecke (2012) suggested that people are likely
583 to think much about both the process and the outcome of goal pursuit when a goal is
584 subjectively very important. This is in line with the significant positive association
585 between the two foci and the perceived importance of the workout in the present study.

586 Although we found that outcome focus was adaptive during the intended workout,
587 it may become maladaptive when people are procrastinating. Specifically, when
588 participants were not working out as planned, they reported a stronger intention to start
589 with the workout after completing the questionnaire when focusing more on the process.
590 However, a higher outcome focus weakened this intention. This fits the results by Freund
591 and Hennecke (2012) who found that an outcome focus was associated with disinhibited
592 eating after failure in keeping the intended diet. In the case of procrastination, a higher
593 outcome focus during procrastination episodes (i.e., asking oneself: "Why am I doing
594 this?") may be related to people rationalizing their behavior (e.g., "Cleaning the house
595 was really important today!") and thus be maladaptive for the intended goal pursuit (here:
596 working out; Kaftan & Freund, 2019). This calls for further research exploring both

597 mechanisms sustaining procrastination and mechanisms leading to disengagement from
598 activities people engage in while procrastinating.

599 **Objective Fitness Improvement**

600 Process focus was strongly related to participants' improvement in the number of
601 push-ups. However, goal focus was not related to their performance in the other three test
602 exercises. The fact that the number of completed workout sessions was largely unrelated
603 to participants' improvement on the objective fitness measures may indicate that other
604 factors such as training intensity are more relevant in this context. However, as both the
605 number of workout sessions and process focus (marginally) predicted whether people
606 achieved their personal goals and their overall workout satisfaction, it may also mean that
607 people did not want to improve on the objective measures (or only regarding the push-
608 ups, which maybe was their favorite exercise). Instead, they may have had other
609 outcomes in mind or regarded their current fitness level as something they want to
610 maintain. Indeed, an inspection of the goals people had set for themselves included goals
611 such as "test my perseverance," "stay healthy," "reduce stress," "have fun," or "improve
612 my body awareness."

613 **Dynamic Changes of Goal Focus**

614 Although goal focus explained a substantial amount of variance in the immediate
615 experience of the workout, the unexplained residual variance also highlights that we have
616 identified but one out of possibly many factors related to the evaluation of the workout,
617 participants' mood, and motivation. Moreover, we observed some interindividual
618 variability in magnitude and direction of the investigated associations. A more detailed
619 inspection of these interindividual differences at the within-person level revealed that

620 they were particularly present regarding the individual level (i.e., intercepts), and less
621 regarding the changes (i.e., slopes). This suggests that the mechanism underlying the
622 effects of goal focus on the perception of the workout equally apply to most people.
623 Similarly, the effects of goal focus at the between-person level tended to be stronger than
624 the effects at the within-person level. However, the fact that the within-person effects
625 were still significant when controlling for the between-person effects suggests that goal
626 focus changes dynamically and influences the immediate evaluation of the workout. That
627 is, different levels in average process focus explain why one person tends to perceive the
628 workout as, for example, rather unpleasant and a second person as rather pleasant.
629 However, for both individuals it is true that, on days they focus more on the workout
630 itself (i.e., on the process), they perceive it as more pleasant than they personally do on an
631 average day. Against this backdrop, future research should explore whether these patterns
632 can be confirmed in different contexts and regarding different activities.

633 **Additional Explanatory Power of Goal Focus**

634 What are the potential implications of this study for interventions helping people to
635 follow through with their goals? It seems that people would profit from zooming in on
636 their goals by focusing both on the process and the outcomes in order to avoid
637 procrastination and achieve their goals. However, there are only very few studies that
638 induced goal focus (see Krause & Freund, 2016; Pham & Taylor, 1999). Can people be
639 taught to adjust their goal focus to further their goal pursuit? In order to strengthen the
640 process focus, it might help to increase the concreteness of a goal, offer information
641 about the means to pursue a goal, and form implementation intentions (Achtziger,
642 Gollwitzer, & Sheeran, 2008; Gollwitzer, 1990). People who use strategies such as

643 detailed action planning also procrastinate less (Wieber & Gollwitzer, 2010), are more
644 likely to engage in intended physical activity (Sniehotta et al., 2005), and show greater
645 performance improvements (Smith, Hauenstein, & Buchanan, 1996). This study suggests
646 that it may also be worthwhile to help people to focus their attention on the activity itself
647 while they are carrying out the intended activity.

648 Despite the promising results of this study, some limitations merit mention. Apart
649 from mood, we assessed the constructs with single items to not overburden the
650 participants. However, this limits the reliability of the measures. Although the experience
651 sampling method has several advantages over lab-based studies (i.e., less issues of
652 external validity), it also has its downsides. For example, our questionnaires may have
653 operated as an intervention and influenced people's behavior. Moreover, causal
654 inferences cannot be drawn. For instance, people may perceive high-intensity exercises as
655 less difficult when they focus more on the process, but the demandingness of the workout
656 may also make people focus more on the process. An experimental setting would allow
657 for more definite causal conclusions regarding whether goal focus is a cause or an effect.
658 For example, people in different experimental groups could be instructed to mentally
659 simulate the workout (i.e., process simulation) and/or to attain positive outcomes (i.e.,
660 outcome simulation). This might lower the likelihood of procrastination and change the
661 level at which they identify their actions when they actually do work out. As a
662 consequence, they might perceive the intended activity as more important which, again,
663 might lead to better adherence to an intention to engage in it (see also Pham & Taylor,
664 1999). Such a study should also involve examining the unique impact of goal focus over
665 and above related constructs such as goal concreteness and difficulty.

666 There is a potential selection effect for participating in a highly demanding workout
667 study over the period of two months. For example, the participants of this study may have
668 been highly motivated to adhere to the workout regimen, thereby limiting the results to
669 goals with high subjective importance.

670 Another problem when investigating procrastination in real life settings is that
671 people might sometimes have had to adjust their workout schedule due to external
672 circumstances (e.g., an urgent business meeting). In this case, missing a workout would
673 not conform to the definition of procrastination that assumes that people could, in
674 principle, have adhered to their intentions. Although we allowed participants to adjust
675 their schedules on the day before, external obstacles that occurred on the same day were
676 not considered as they could easily occur in cases of actual procrastination. For instance,
677 instead of working out as scheduled, it might appear very important to finish a work
678 project or to clean the house. Had we allowed to very short-term rescheduling, we might
679 not have found any instances of procrastination because, oftentimes, people do believe
680 that the activity they use to procrastinate the target activity is important. Nevertheless, in
681 some cases we might have incorrectly categorized incidents of true external obstructions
682 of the targeted activity as procrastination. However, this would have worked against
683 finding support for our hypotheses as such miscategorizations introduce noise and
684 unsystematic variance into the data. One solution could have been to ask participants
685 directly whether they procrastinated. However, we consider this approach as problematic
686 because, again, it can trigger justification and rationalization (Anderson, 2016). That is,
687 people may, at least temporarily, believe that their behavior is justified, although “they

688 are conscious, at some level of the commitment and the deadlines” (p. 55; see also Kroese
689 & De Ridder, 2016).

690 **Conclusions**

691 Many people pursue the goal to exercise regularly. Given the low adherence rates
692 associated with physical exercise, it is important to identify correlates of this health
693 behavior to direct intervention research and help people to achieve their goals (Dishman
694 & Sallis, 1994). The study consistently showed that adopting a process focus is positively
695 associated with goal pursuit and affective well-being both at a proximal (e.g., people
696 perceive the workout as more pleasant while working out) and aggregated level (e.g.,
697 people work out as planned more often; see also Freund et al., 2010). Moreover, this
698 study is the first to also point to immediate benefits of adopting an outcome focus in a
699 real-life setting (e.g., people are more motivated). However, the results regarding
700 outcome focus were more mixed: Outcome focus was not related to the number of
701 workout sessions, overall workout satisfaction, as well as goal achievement, and seems
702 even maladaptive once people are procrastinating (i.e., not sticking to their workout
703 plans).

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Endnotes

870 ¹ A detailed description of goal focus and how it is related to—but distinct from—
871 the constructs of intrinsic/extrinsic motivation, mastery/performance goal orientation, and
872 goal concreteness can be found in Freund, Hennecke, and Mustafić (in press) and Freund
873 and Hennecke (2012).

874 ² We also ran the multilevel analyses with an additional predictor variable
875 indicating dropout. This had virtually no influence on the magnitude of the effects of
876 process and outcome focus.

877 ³ Unfortunately, we are prevented from making the data of this study public, as our
878 informed consent at the time of data collection did not inform participants about this
879 possibility. The data are available upon request.

880 ⁴ In order to avoid convergence problems, for this analysis, the centered time
881 variable was rescaled to range from -3 to 3.

882 ⁵ When considering all participants (i.e., completers and noncompleters), the results
883 were comparable: process focus: $B = 1.05$, $SE B = 0.51$, $\beta = 0.12$, $p = .039$, 95% CI [0.09,
884 2.06]; outcome focus: $B = -0.38$, $SE B = 0.42$, $\beta = -0.06$, $p = .359$, 95% CI [-1.25, 0.43];
885 intercept: $B = 10.47$, $SE B = 2.56$, $p < .001$, 95% CI [5.31, 16.09]; adjusted $R^2 = .007$,
886 $F(2,322) = 2.16$, $p = .117$.

887 ⁶ The analysis was also computed without controlling for the effect of number of
888 workout sessions. Average process focus during workout predicted personal goal
889 achievement, $B = 0.32$, $SE = 0.14$, $Wald(1) = 5.54$, $p = .019$, 95% CI [0.05, 0.62]: A one-
890 unit increase in average process focus was associated with an increase in the odds of
891 achieving the personal goal by 38% when holding outcome focus constant. Average

892 outcome focus did not predict whether participants achieved their goals or not ($B = -0.13$,
893 $SE = 0.12$, Wald(1) = 1.37, $p = .242$, 95% CI [-0.37, 0.07]; intercept: $B = -0.70$, $SE =$
894 0.67, Wald(1) = 1.08, $p = .299$, 95% CI [-2.13, 0.65]; $\chi^2 = 5.84$, $p = .054$ with $df = 2$,
895 McFadden $R^2 = 0.03$).

Table 1

*Descriptive Statistics and Bivariate Correlations Between Workout Characteristics and Goal**Focus*

Dimension	1	2	3	4	5	6	7	8
1. Process Focus	-	.37***	.43***	.48***	.57***	-.15*	.27***	.31***
2. Outcome Focus	.32***	-	.53***	.19**	.30***	.02	.11	.07
3. Importance	.34***	.38***	-	.43***	.56***	.02	.20**	.17**
4. Pleasantness	.35***	.14***	.35***	-	.67***	-.46***	.41***	.38***
5. Motivation	.42***	.22***	.44***	.57***	-	-.22***	.43***	.41***
6. Difficulty	-.10***	.02	-.01	-.35***	-.20***	-	-.40***	-.37***
7. Mood	.22***	.12***	.20***	.38***	.40***	-.31***	-	.36***
8. Confidence	.23***	.08***	.18***	.27***	.33***	-.27***	.29***	-
<i>M</i>	4.95	4.63	5.42	4.60	4.72	3.36	5.72	4.72
<i>SD</i>	1.41	1.64	1.29	1.33	1.58	1.58	0.99	1.55

Note. Values below the diagonal denote day level correlations ($N = 4,481$ observations). Values above the diagonal denote person level correlations ($N = 242$ persons).

*** $p < .001$. All significant correlations remain significant after Bonferroni correction.

Table 2

Parameter Estimates for Multilevel Model of Importance, Pleasantness, and Motivation as a Function of Goal Focus

	Importance					Pleasantness					Motivation				
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅		<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅		<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅	
				Lower	Upper				Lower	Upper				Lower	Upper
Fixed effects															
Intercept	5.34*	0.05	105.41	5.25	5.45	4.54*	0.05	87.98	4.44	4.64	4.61*	0.06	79.01	4.49	4.72
Time	-0.004*	0.001	-2.72	-0.01	-0.001	0.002	0.002	1.35	-0.001	0.01	-0.01*	0.002	-4.54	-0.01	-0.005
Within PF	0.12*	0.02	6.61	0.09	0.16	0.19*	0.02	8.14	0.14	0.23	0.29*	0.02	12.35	0.24	0.34
Within OF	0.11*	0.02	6.94	0.08	0.14	0.04*	0.02	2.45	0.01	0.08	0.08*	0.02	3.94	0.04	0.12
Within PFxOF	-0.003	0.02	-0.19	-0.03	0.03	0.02	0.02	1.12	-0.02	0.05	-0.02	0.02	-0.85	-0.05	0.02
Between PF	0.24*	0.05	5.11	0.15	0.34	0.42*	0.05	8.37	0.32	0.52	0.51*	0.06	9.06	0.40	0.63
Between OF	0.34*	0.04	8.77	0.27	0.42	0.004	0.04	0.09	-0.08	0.08	0.14*	0.05	3.11	0.05	0.24
Between PFxOF	0.03	0.03	0.99	-0.03	0.08	0.02	0.03	0.76	-0.03	0.08	0.03	0.03	0.88	-0.04	0.09
Random effects															
Level 2	Variance	<i>SD</i>		<i>CI</i> ₉₅		Variance	<i>SD</i>		<i>CI</i> ₉₅		Variance	<i>SD</i>		<i>CI</i> ₉₅	
Intercept	0.68	0.82		0.75	0.90	0.68	0.83		0.75	0.90	0.86	0.93		0.85	1.01
Within PF	0.03	0.19		0.14	0.22	0.06	0.24		0.19	0.28	0.04	0.20		0.14	0.25
Within OF	0.02	0.14		0.10	0.17	0.03	0.16		0.12	0.20	0.03	0.17		0.11	0.21
Within PFxOF	0.01	0.11		0.07	0.14	0.01	0.12		0.07	0.15	0.01	0.11		0.05	0.16
Level 1															
Residual	0.56	0.75		0.73	0.77	0.72	0.85		0.83	0.87	1.02	1.01		0.99	1.03
Pseudo <i>R</i> ² †	0.13					0.10					0.12				

Note. *N* = 325 persons, 4,484 observations. Controlling for time (mean-centered). PF = process focus; OF = outcome focus.

† Likelihood-ratio based adjusted pseudo *R*² represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.

*95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1,000 simulations; normal approximation).

Table 3

Parameter Estimates for Multilevel Model of Difficulty, Mood, and Confidence as a Function of Goal Focus

	Difficulty					Mood					Confidence				
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅		<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅		<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅	
				Lower	Upper				Lower	Upper				Lower	Upper
Fixed effects															
Intercept	3.48*	0.07	49.90	3.33	3.62	5.64*	0.04	134.03	5.55	5.72	4.36*	0.08	55.80	4.21	4.52
Time	-0.02*	0.002	-14.16	-0.03	-0.02	0.003*	0.001	2.43	0.001	0.01	-0.02*	0.001	-12.44	-0.02	-0.01
Within PF	-0.04	0.02	-1.65	-0.08	0.01	0.11*	0.01	7.32	0.08	0.14	0.11*	0.02	6.46	0.08	0.15
Within OF	0.05*	0.02	2.93	0.02	0.09	0.04*	0.01	3.68	0.02	0.07	0.03	0.01	1.71	-0.004	0.06
Within PFxOF	-0.02	0.02	-0.90	-0.05	0.02	-0.02	0.01	-1.74	-0.04	0.002	0.02	0.01	1.59	-0.01	0.04
Between PF	-0.23*	0.07	-3.37	-0.36	-0.09	0.18*	0.04	4.41	0.10	0.25	0.38*	0.08	5.04	0.23	0.53
Between OF	0.08	0.06	1.39	-0.04	0.19	0.05	0.03	1.49	-0.02	0.11	0.03	0.06	0.40	-0.10	0.15
Between PFxOF	-0.12*	0.04	-3.16	-0.20	-0.05	0.03	0.02	1.21	-0.02	0.07	0.08	0.04	1.76	-0.01	0.16
Random effects															
Level 2	Variance	<i>SD</i>				Variance	<i>SD</i>				Variance	<i>SD</i>			
Intercept	1.31	1.14		1.05	1.25	0.47	0.68		0.62	0.74	1.73	1.32		1.21	1.42
Within PF	0.05	0.22		0.17	0.27	0.02	0.14		0.11	0.17	0.03	0.16		0.11	0.20
Within OF	0.02	0.13		0.08	0.17	0.01	0.09		0.06	0.12	0.02	0.13		0.09	0.16
Within PFxOF	0.02	0.13		0.08	0.17	0.001	0.04		0.01	0.07	0.002	0.04		0.003	0.08
Level 1															
Residual	0.89	0.94		0.92	0.97	0.41	0.64		0.63	0.66	0.55	0.74		0.72	0.76
Pseudo <i>R</i> ² †	0.09					0.81					0.77				

Note. *N* = 325 persons, 4,484 observations (i.e., difficulty) / 4,481 observations (i.e., mood and confidence). Controlling for time (mean-centered). PF = process focus; OF = outcome focus.

† Likelihood-ratio based adjusted pseudo *R*² represents proportional reductions in the variance-component residual in comparison with model without explanatory variables.

*95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1,000 simulations; normal approximation).

Table 4

Multiple Regression for Prediction of Personal Difference in Plank and Squat (Post Minus pre in Seconds) by Average Goal Focus

Variable	Plank						Squat					
	ΔR^2	<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅		ΔR^2	<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅	
					Lower	Upper					Lower	Upper
Step 1	.002 [†]						.00002 [†]					
Intercept		19.78*	3.10	6.38	13.81	25.75		22.18*	3.18	6.97	16.16	28.64
Nr. of workouts		-0.12	0.16	-0.74	-0.46	0.21		-0.01	0.17	-0.07	-0.34	0.32
Step 2	.002 [†]						.005 [†]					
Intercept		15.47*	7.10	2.18	0.89	28.48		23.50*	7.29	3.23	9.58	36.64
Nr. of workouts		-0.13	0.17	-0.81	-0.47	0.19		0.01	0.17	0.06	-0.33	0.35
Process focus		0.68	1.32	0.51	-1.64	2.97		-1.20	1.36	-0.89	-3.79	1.45
Outcome focus		0.27	1.11	0.24	-2.01	2.55		0.91	1.14	0.80	-1.33	3.13

Note. $N = 227$. [†] $p > .05$.

*95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1,000 simulations; normal approximation).

Table 5

Multiple Regression for Prediction of Personal Difference in Push-Ups and High Knees (Post Minus pre in Repetitions) by Average Goal Focus

Variable	Push-ups						High knees					
	ΔR^2	<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅		ΔR^2	<i>B</i>	<i>SE</i>	<i>t</i>	<i>CI</i> ₉₅	
					Lower	Upper					Lower	Upper
Step 1	.05 ^a						.00001 [†]					
Intercept		5.23*	1.16	4.53	3.09	7.41		14.72*	1.61	9.14	11.71	17.88
Nr. of workouts		.20*	0.06	3.24	0.07	0.33		-0.004	0.08	-0.04	-0.17	0.14
Step 2	.02 ^a						.02 [†]					
Intercept		0.38	2.59	0.15	-4.08	4.51		15.71*	3.67	4.28	8.90	22.84
Nr. of workouts		0.18*	0.06	2.91	0.05	0.31		0.02	0.09	0.20	-0.14	0.17
Process focus		1.08*	0.48	2.24	0.18	2.03		-1.17	0.68	-1.73	-2.42	0.05
Outcome focus		-0.02	0.41	-0.04	-1.08	0.85		0.95	0.57	1.67	-0.09	2.12

Note. Push-ups: $N = 226$. High knees: $N = 225$. ^a $p = .001$. [†] $p > .05$.

*95% Confidence Interval does not include 0. Confidence Intervals estimated using bootstrapping (1,000 simulations; normal approximation).

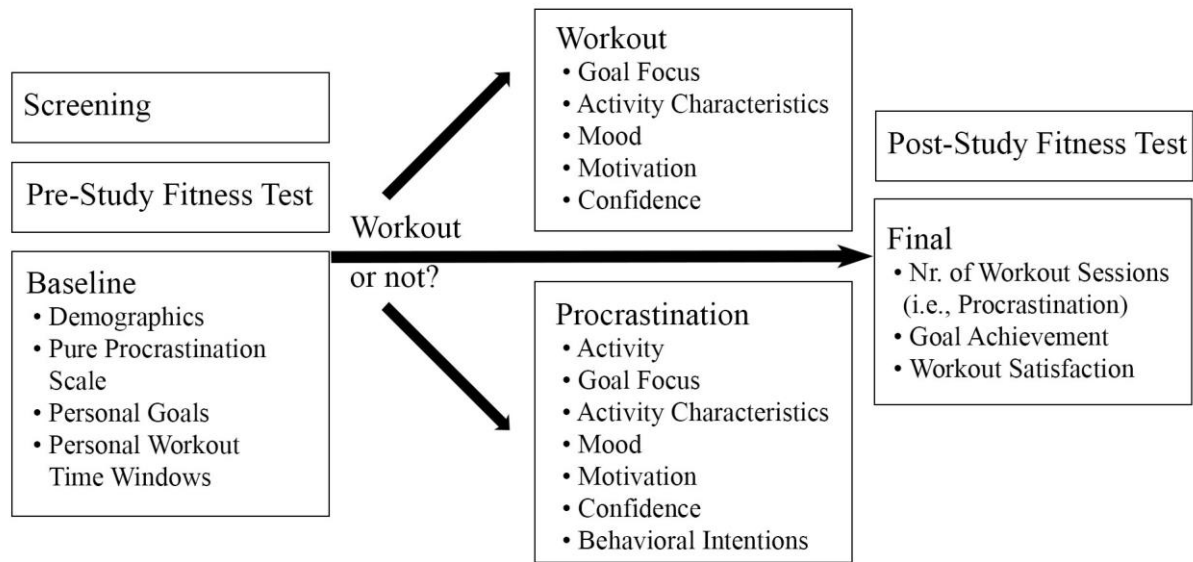


Figure 1. Diagram depicting when the most relevant constructs were assessed in the study.