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## Motives and Mental Contrasting With Implementation Intentions

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### Predict Progress and Management of Goals in Parents

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All data for this project has been made publicly accessible via the Open Science Framework

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(<https://osf.io/57dzk/>)

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31 **Abstract**

32 Parents must rapidly adapt goals from various aspects of their lives to accommodate the  
33 demands of the early stages of parenthood. According to the Self-Concordance Model,  
34 having autonomous goal motives (based on enjoyment or personal goal value) should foster  
35 effective self-regulation (e.g., coping strategies), better goal management, and increase the  
36 likelihood of goal attainment, compared to controlled motives (goals driven by  
37 demands/pressures). Metacognitive techniques, such as Mental Contrasting with  
38 Implementation Intentions (MCII), can also facilitate goal regulation. We used experience  
39 sampling over one month to study goal striving in parents ( $N = 103$ ). We investigated how  
40 motives and spontaneously occurring features of MCII (i.e., mental imagery, reflection on  
41 obstacles, implementation intention planning) predict three key self-regulatory coping  
42 strategies: exerting effort, disengaging, and modifying/adjusting goals to make them  
43 attainable. We examined whether these strategies influenced relations between motives and  
44 goal progress, intergoal facilitation, and interference between parenting/competing life goals.  
45 Autonomous motives and MCII-like features were positively associated with effort coping,  
46 which in turn was related to goal progress and facilitation. Additionally, in individuals with  
47 high controlled motives, MCII-like features positively predicted increased adjustment of  
48 competing life goals. Goal adjustment positively predicted differences in intergoal  
49 facilitation. Results indicate that exerting effort and adjusting goals are effective strategies for  
50 attaining and managing multiple goals. Both goal motives and MCII-like features are  
51 associated with the use of these strategies. The findings suggest that parents will benefit from  
52 selecting autonomously motivated goals and using MCII-like features to manage parenting  
53 and other competing life goals.

54 *Keywords:* goal progress, goal management, motives, mental contrasting with  
55 implementation intentions, parenthood

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## **Motives and Mental Contrasting With Implementation Intentions**

### **Predict Progress and Management of Goals in Parents**

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60 Parents must rapidly learn to adapt various aspects of their life to accommodate goals  
61 associated with parenting (Shockley et al., 2017). The inability to manage multiple goals  
62 appropriately can lead to intergoal interference, reduced goal progress, and decreased  
63 wellbeing (Gray et al., 2017). In contrast, if goals can be balanced harmoniously, goal  
64 progress and intergoal facilitation can occur, leading to higher likelihoods of goal attainment  
65 and increased wellbeing (Riediger & Freund, 2004). Motivation plays a central role in a  
66 person's ability to regulate and benefit from goal striving (Ryan & Deci, 2017).

67 Understanding how motivational factors predict the attainment and management of goals in  
68 parents, particularly during early stages of parenthood, has ramifications for both parental  
69 psychological health and child development (Jungert et al., 2015), yet remains an overlooked  
70 topic.

71 In this article, we draw on and expand an established model of goal regulation, the  
72 Self-Concordance Model (Sheldon & Elliot, 1999), as a framework to address outstanding  
73 questions related to the role of motives and key coping processes in parental goal striving.  
74 Furthermore, we investigate whether the spontaneous occurrence of cognitive features  
75 inherent in mental contrasting with implementation intentions (MCII; Oettingen &  
76 Gollwitzer, 2010) fosters effective regulation of multiple goals, thus establishing evidence for  
77 developing MCII interventions tailored for parents.

### **The Role of Motives in Self-Regulatory Coping**

79 According to the Self-Concordance Model (Sheldon & Elliot, 1999), which is  
80 grounded in Self Determination Theory (Ryan & Deci, 2017), motives contribute to the  
81 likelihood of experiencing goal progress and attainment. Goals that align with an individual's  
82 values, beliefs, and self-concepts are autonomously motivated (e.g., striving for a goal  
83 because it brings joy or satisfaction). Controlled motivation, on the other hand, denotes goal  
84 striving driven by internal (e.g., to avoid shame or guilt) or external (e.g., to attain money or  
85 tangible benefits) pressures or demands (Ryan & Deci, 2017). A meta-analysis of the separate

86 contributions of autonomous and controlled motives to goal pursuit indicated that  
87 autonomous motivation predicts an improved likelihood of goal progress, whereas controlled  
88 motives are negatively related to goal progress (Gaudreau et al., 2012).

89 Differences in goal progress experienced under autonomous and controlled motives  
90 can be partially explained by the self-regulatory coping mechanisms that individuals use  
91 (Heckhausen et al., 2010; Ntoumanis et al., 2009). Broadly, self-regulatory coping  
92 mechanisms can be defined as cognitive and behavioral processes enacted in response to a  
93 stressor. Autonomous motives have been linked to task-based coping strategies intended to  
94 directly manage the stressor. The exertion of effort, in particular, is a coping mechanism that  
95 increases persistence in the face of adversity, typically conducting to goal progress (Riddell et  
96 al., 2022). Conversely, controlled motives are more likely to instigate coping strategies  
97 associated with behavioral or mental disengagement from the goal (Gaudreau et al., 2012;  
98 Ntoumanis et al., 2014a; Smith et al., 2011).

99 Although coping by exerting effort is adaptive when goals are attainable,  
100 accommodative coping, in which individual disengage from pursuit and adjusts their  
101 approach to circumvent or adapt to obstacles, is necessary when goals become unattainable  
102 (Brandstätter & Bernecker, 2021; Brandtstädter & Rothermund, 2002). Individuals faced with  
103 the decision of whether to continue pursuing a failing course of action are more likely to  
104 question the value of continued pursuit and downgrade goal relevant resources (Herrmann et  
105 al., 2019). Accepting a goal's unattainability, unburdening resources, and ultimately  
106 disengaging from a failing goal also serves to enable goal adjustment (i.e., modifying a goal  
107 to make it achievable; Brandstätter & Bernecker, 2021; Carver & Scheier, 2005; Scobbie et  
108 al., 2021; Wrosch & Scheier, 2020). Although controlled motivation is positively associated  
109 with disengagement, it is not predictive of adjustment (Ntoumanis et al., 2014b). On the other  
110 hand, autonomously motivated individuals find it more difficult to disengage from goals but  
111 easier to adjust, particularly if the goal's unattainability is realized early in the striving  
112 process (Ntoumanis et al., 2014b).

113 The scope of evidence regarding how motives influence parental coping and in turn  
114 goal striving is limited. For parents with limited economic and societal opportunities,

115 disengagement from unattainable work or family goals is linked to increased wellbeing,  
116 indicating that disengagement can act as a protective mechanism when goal striving resources  
117 are limited (Heckhausen et al., 2019; Tomasik et al., 2010). Similarly, for parents of children  
118 diagnosed with cancer, the ability to disengage from unattainable goals and adopt viable  
119 alternatives has been related to decreased depressive symptomology (Wrosch et al., 2003).  
120 Here, we use the Self-Concordance Model as a framework for understanding how motives  
121 predict key self-regulatory coping strategies during goal striving (i.e.,  
122 effort/disengagement/adjustment) and in turn goal progress in parents. We formulated two  
123 hypotheses, which apply to both parenting and broader life goals:

124 *H1a. Autonomous goal motives will be positively related to goal adjustment and effort*  
125 *coping, which will in turn will be positively related to goal progress.*

126 *H1b. Controlled motives will be positively related to disengagement coping, which*  
127 *will be negatively related to goal progress.*

## 128 **The Role of Motives in Goal Management**

129 Goal striving rarely occurs in a vacuum, and it is important to consider a person's  
130 goals in the context of their other pursuits (Kung & Schoeler, 2020). Given the competing  
131 demands of early-stage parenthood, the capacity to balance various pursuits may have a  
132 substantial impact on goal striving success. Motives can also affect the ability to manage  
133 multiple competing goals. In parents, controlled motivation for either work or family goals is  
134 associated with family alienation, which in turn contributes to work-family conflict and  
135 emotional exhaustion (Kuvaas et al., 2017; Senécal et al., 2001). In contrast, individuals  
136 engaged in their work for autonomous reasons are more likely to experience enrichment  
137 between their work and family lives, as well as engagement with their goals (Ilies et al.,  
138 2017; Kuvaas et al., 2017). Research on how individuals manage parenting goals alongside  
139 goals outside of the career domain, however, is lacking. We address this gap by examining  
140 how motives and coping strategies predict facilitation and interference between multiple  
141 goals from a range of life domains in early-stage parents. Furthermore, we investigate how  
142 these intergoal dynamics relate to goal progress. For both parenting and life goals, we  
143 hypothesize that:

144 *H2a. Autonomous goal motives, effort coping, and goal adjustment will be positively*  
145 *related to intergoal facilitation.*

146 *H2b. Controlled goal motives and disengagement coping will be positively related to*  
147 *intergoal interference.*

148 *H2c. Intergoal facilitation will be positively related, whereas intergoal interference*  
149 *will be negatively related, to goal progress.*

### 150 **Mental Contrasting with Implementation Intentions**

151 Finally, although it is important to understand factors that contribute to effective goal  
152 striving, it is also crucial to determine how these factors can be strengthened. MCII  
153 (Oettingen & Gollwitzer, 2010) is a metacognitive strategy that has been used to promote  
154 goal progress for challenging goals in various contexts (Wang et al., 2021). In MCII, an  
155 individual first imagines the attainment of their goal, and then contrasts this imagined state  
156 with reality to identify obstacles to the goal's attainment (mental contrasting; Oettingen,  
157 2012). The individual subsequently forms simple 'if-then' plans (implementation intentions;  
158 Gollwitzer & Schaal, 1998) to help them overcome these obstacles should they arise. Mental  
159 contrasting reinforces goal commitment when the expected likelihood of goal attainment is  
160 high, but reduces commitment when the likelihood of attainment is low (Kappes &  
161 Oettingen, 2014). Similarly, MCII and implementation intentions can facilitate the reduction  
162 in commitment to excessively costly goals (Legrand et al., 2017; Riddell et al., 2022).

163 Research on the usefulness of MCII for parents is limited. However, there is some  
164 evidence that training parents to use implementation intentions can improve various health  
165 outcomes (e.g., oral health, sunscreen use) in their children, particularly if parents are  
166 motivated to attain these goals (Armitage et al., 2020; Van Osch et al., 2008). Of particular  
167 relevance to the current study, mental contrasting can increase individuals' willingness to  
168 exert effort toward balancing work and family goals (Oettingen, 2000). The benefits of the  
169 mental contrasting process can transfer from one task to another, which may be particularly  
170 advantageous for multiple goal pursuit (Sevincer et al., 2022).

171 The capacity of MCII to modulate goal commitment based on a goal's attainability  
172 makes it an interesting candidate for promoting efficacious self-regulation. Ntoumanis and

173 Sedikides (2018) proposed that interactions between MCII and goal motives could influence  
174 self-regulatory responses to goals. For individuals with controlled motivation, MCII should  
175 encourage effort towards attainable goals and accommodative coping in the face of adversity,  
176 both of which would otherwise be diminished under controlled motivation (Riddell et al.,  
177 2022). Given that autonomous motivation already encourages commitment and persistence,  
178 autonomously motivated goals that are attainable should benefit less from MCII (Ntoumanis  
179 et al., 2014a). If an autonomously motivated goal becomes unattainable, MCII should  
180 facilitate disengagement, which is more difficult for autonomously motivated individuals due  
181 to their personal investment in the pursued goal (Ntoumanis et al., 2014b). This has  
182 implications for the applied utility of MCII for parents, who often have accommodate  
183 multiple goals underpinned by differing motives (Kuvaas et al., 2017).

184 Both mental contrasting (Sevincer & Oettingen, 2013) and implementation intentions  
185 (Bieleke & Keller, 2021; Brickell et al., 2006) can arise spontaneously in the absence of  
186 prompts or training, conferring similar benefits to goal striving as trained interventions. More  
187 broadly, habitually engaging in thoughts about situational cues and intended future actions  
188 relevant to goal pursuit can also promote goal striving (Martiny-Huenger et al., 2022). Here,  
189 we seek to provide evidence that spontaneously arising cognitive features of MCII (e.g.,  
190 fantasizing, identifying obstacles, forming specific plans) help parents to co-manage  
191 parenting and life goals. This is an important step for establishing the potential usefulness of  
192 MCII-based interventions for parents, as self-regulation interventions are most effective when  
193 they align with techniques that individuals use naturally (Peetz & Davydenko, 2021). In this  
194 article, we test whether MCII-like cognitive features arise spontaneously and can support  
195 goal striving in parents. For both parenting and life goals, we hypothesize:

196 *H3a. MCII-like cognitive features will be positively related to goal adjustment and*  
197 *effort coping.*

198 *H3b. MCII-like features will predict greater effort coping and goal adjustment in*  
199 *individuals with strong controlled motives.*

200 *H3c. MCII-like features will predict greater disengagement coping in individuals with*  
201 *strong autonomous motives.*

## 202 **Overview**

203           We address the question of how goal motives and spontaneously occurring MCII-like  
204 cognitive features relate to self-regulatory coping in early-stage parents, and how these in  
205 turn relate to multiple goal management and progress. The Self-Concordance Model details  
206 how a person's motives influence their thoughts and behaviors during goal striving, and is  
207 thus inherently specified at the intra-individual. Nonetheless, the Self-Concordance Model is  
208 frequently evaluated by looking at differences between people (e.g., cross-sectional surveys).  
209 In such cases, the failure to examine within-person effects can result in research that is  
210 misaligned with the tested theory (Gabriel et al., 2019). The dynamic nature of goal striving  
211 is frequently overlooked (Neal et al., 2017), we use experience sampling (i.e., diary study) to  
212 probe how motives and self-regulatory coping predict goal outcomes both between-persons  
213 (i.e., what differentiates one individual from another) and within-persons (i.e., what  
214 differentiates one instance of goal striving from another). We asked early-stage parents to  
215 identify one parenting goal (e.g., spend more time playing with my child). We also asked  
216 them to identify one goal from another aspect of their life (e.g., start running again) that they  
217 planned to pursue for at least the next six months<sup>1</sup> and would compete with their parenting  
218 goal. Over the following month, we measured goal progress, intergoal  
219 facilitation/interference, disengagement coping, effort coping, goal adjustment, and  
220 spontaneous use of MCII-like cognitive features every three days.

## 221 **Method**

### 222 **Transparency and Openness**

223           We preregistered the hypotheses, method, and analyses on Open Science Framework  
224 (OSF). All data and analysis scripts are available on the project's OSF page  
225 (<https://osf.io/57dzk>). We initially registered the study as a measurement burst design that  
226 involved assessing participants every three days in two separate and identical month-long  
227 bursts over a six-month period. Due to an unexpected number of participants dropping out of

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<sup>1</sup> We were interested in long-term goals that were likely to cover the duration of the preregistered study; however, due to factors that limited the longitudinal data analysis, we present results from the first measurement month only (see *Method* for detail).



228 the second measurement burst, we departed from the preregistered design by reporting results  
229 for the first measurement period only<sup>2</sup>. Importantly, the hypotheses and variables that we  
230 measured are the ones named in the preregistration. We provide on the project's OSF page  
231 both data collected in both bursts and measures (overall goal progress/ease of  
232 disengagement/goal adjustment, parental efficacy, striving tenacity/flexibility, goal  
233 importance/attainability/ difficulty) taken either prior to or following each burst but not  
234 analyzed.

### 235 **Sample Size**

236 Due to the departure from the preregistered design, we used Monte Carlo simulations  
237 ( $N = 1,000$ ) to estimate the size of model coefficients that could be reliably detected with at  
238 least 80% power given the sample of 103 participants collected in the first burst to provide a  
239 boundary of confidence for interpretation of the observed effects (Arend & Schäfer, 2019).  
240 We determined that the smallest reliably detectable path coefficient, given our sample, is  $\beta =$   
241  $.10$  for all paths at the within-person level. At the between-person level, the smallest reliably  
242 detectable coefficients are:  $\beta = .10$  for paths between motives/MCII-like features and self-  
243 regulation variables,  $\beta = .27$  for paths between self-regulation variables and goal  
244 progress/facilitation/interference, and  $\beta = .30$  for paths between facilitation/interference and  
245 goal progress. Significant path coefficients smaller than these values may be underpowered  
246 and should be interpreted with caution.

### 247 **Participants**

248 The study was approved by the Curtin University Human Research Ethics Committee.  
249 We recruited 107 early-stage parents<sup>3</sup>, that is, individuals living with at least one child aged

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<sup>2</sup> We recruited  $N = 107$  for the first measurement burst, but  $n = 42$  did not complete the second burst three months later. The remaining sample ( $n = 61$ ) would entail inadequate statistical power for the analysis of the burst design (a priori power simulations determined that  $N = 80$  would have provided 80% statistical power for the planned burst analysis). Additionally, in the preregistration we stated that we would conduct exploratory multilevel structural equation modelling (MLSEM; Preacher et al., 2010). We adopted the MLSEM approach as the main analysis in the current article to maximize the utility of the relatively large sample gathered in the first burst. This analysis mirrors the one planned in the preregistration (i.e., the same variables are regressed on one another), but precludes the need to execute multiple analyses, thus reducing a potential source of error.

<sup>3</sup> Based on IP addresses and home addresses we are confident that parents were from separate households, but cannot unambiguously exclude the possibility that some participants were co-parents

250 between 6-36 months. This range covers the period of rapid adjustment associated with early  
251 parenthood, while precluding the intense care period following childbirth and the alleviated  
252 care requirements associated with the onset of kindergarten care. Both mothers and fathers  
253 were eligible for participation. We excluded four participants who completed only one diary  
254 survey during the month, as we were interested in assessing effects at both within-person and  
255 between-person levels. The final sample was 103. We recruited some (14) participants  
256 through word-of-mouth at Australian organizations that cater to early parents (e.g., child-  
257 parent centers, daycare centers). We recruited the remaining participants (89) via Prolific  
258 Academic; they were from the United Kingdom, which has a similar cultural and  
259 demographic profile to Australia (Lansford, 2022). Most participants (85%) were female with  
260 a mean age of 33.40 years ( $SD = 5.13$ ); 95% of them were in a relationship; 77% were  
261 employed at least part time and spent an average of 21.07 hours per week working ( $SD =$   
262  $15.50$ ). Participants had 1.75 children on average ( $SD = .79$ ). We compensated them up to  
263 \$38 USD for the percentage of the study they completed.

## 264 **Baseline Measures**

### 265 *Goal Motives*

266 We measured autonomous and controlled goal motives at baseline for both the  
267 parenting and competing life goal using an 8-item goal motives scale (Ntoumanis et al.,  
268 2014a). It consisted of four items relating to autonomous goal motives (e.g., “Because of the  
269 enjoyment or challenge the pursuit of the goal provides me”) and four items relating to  
270 controlled motives for goal pursuit (e.g., “I will receive praise or other rewards for doing it”;  
271  $1 = not\ at\ all, 7 = very\ much\ so$ ). Participants first rated motives for their parenting goal and  
272 then rated motives for their competing life goal. We calculated separate autonomous and  
273 controlled motives scores for each goal by averaging the items relevant to each construct.

274 Participants re-rated goal motives whenever they changed their goal. During the  
275 study, 21 participants reported changing their competing life goal and 10 reported changing

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of a child. Co-parents would still have different goals, with day-to-day factors influencing their striving. Thus, any dependency in responses resulting from parents sharing a child is likely to be minimal.

276 their parenting goal. Most maintained their original goals or changed goals only once. Over  
277 the whole sample, the parenting goal was changed on 2%, whereas the competing life goal  
278 was changed on 4%, of measurements. Given the relative infrequency of goal changes, there  
279 was correspondingly low within-person variability in goal motives. We created weighted  
280 motives scores at the between-person level only by averaging motives scores for the previous  
281 and new goal, and weighting averages by the number of days they spent striving for each  
282 goal. For example, for a participant who completed all measurements but reported changing  
283 their goal once on the third measurement, we would assign the original motives scores a  
284 weight of three and the new motives scores a weight of seven.

## 285 **Diary Measures**

### 286 ***Goal Progress***

287 We measured progress for each goal with three items adapted from Louro et al.  
288 (2007). A sample item is: “How much progress have you made towards your PARENTING  
289 goal?” (1 = *none/not at all*, 7 = *a lot/very*).

### 290 ***Coping Strategies***

291 We measured two coping strategies with three items each: effort coping (e.g., “I  
292 concentrated my efforts on the goal”) and disengagement coping (e.g., “I stopped believing in  
293 my ability to reach my goal”; 1 = *not at all*, 7 = *very much so*). We derived the items from the  
294 effort and disengagement coping subscales of the English version of the l'Inventaire des  
295 Stratégies de Coping en Compétition Sportive (Gaudreau & Blondin, 2002)

### 296 ***Goal Adjustment***

297 We measured the ease with which participants were able to adjust their goal striving  
298 by looking for new ways to pursue their goal. Participants rated the extent to which they  
299 agreed (1 = *strongly disagree*, 5 = *strongly agree*) with three statements (e.g., “I tried  
300 pursuing my goal in different ways”) adapted from Wrosch et al. (2003).

### 301 ***MCII-Like Cognitive Features***

302 We measured the spontaneous occurrence of three cognitive features inherent to the  
303 MCII process, namely, use of mental imagery, reflection on obstacles, and use of  
304 implementation intention planning, with three items each (1 = *not at all*, 7 = *very much so*).

305 We adapted the mental imagery items (e.g., “I imagined that I was doing well at attaining my  
306 goal”) from the imagery scale of the English version of the l'Inventaire des Stratégies de  
307 Coping en Compétition Sportive (Gaudreau & Blondin, 2002). We adapted two of the  
308 reflection on obstacles items (e.g., “I thought about what setbacks to expect”) from the  
309 Overcoming Obstacles subscale of the If-Then Planning Scale (Bieleke & Keller, 2021), and  
310 created the third item (“I considered what barriers might hinder the attainment of my goal”).  
311 We adapted the planning items (e.g., “I planned where and how I was going to engage in my  
312 goal”) from Brickell et al. (2006). We present reliabilities for the three subscales for the  
313 parenting goal at the within- and between-person levels (Geldhof et al., 2014) in  
314 Supplementary Material. We calculated an overall MCII-like cognitive features score for  
315 each goal by averaging scores for all three subscales. This approach is similar to the one  
316 adopted for the study of spontaneous implementation intentions (Bieleke & Keller, 2021).

317 Our overall MCII-like cognitive features score does not disentangle the order in which  
318 individuals engage in cognitions. Our use of the term “MCII-like features” denotes the  
319 tendency to engage spontaneously in the cognitive processes that are an inherent part of MCII  
320 but should not be confounded with the use of MCII itself. Without future validation, we  
321 cannot assume that the term directly reflects MCII.

### 322 ***Intergoal Interference/Facilitation***

323 We measured intergoal facilitation and interference with three items relating to  
324 intergoal interference (e.g., “Pursuing one goal limited my ability to pursue the other goal”) and  
325 three items relating to intergoal facilitation (e.g., “I did something in the pursuit of one  
326 goal that was simultaneously beneficial for the other goal”); 1 = *not at all*, 7 = *very much so*;  
327 Riediger & Freund, 2004). We asked participants to reflect specifically on interference and  
328 facilitation between their parenting goal and competing life goal. Given the interrelation of  
329 goals and, as per prior research, we did not have separate facilitation and interference scores  
330 for each goal, but rather one score that reflected facilitation between the parenting and  
331 competing life goal, and one score that reflected interference between the parenting and  
332 competing life goal.

### 333 **Procedure**

334 Participants filled out all measures online. First, they provided demographic  
335 information. Then, they were instructed to list a high-level parenting goal and a non-  
336 parenting goal that was likely to compete with their parenting goal for resources, at least  
337 some of the time. High-level goals were described as: “[goals that are] abstract enough that  
338 you can think of multiple ways of achieving them but defined enough that you should also be  
339 able to come up with clear signs of progress”. The most frequently reported parenting goals  
340 were those associated with spending more quality time with their child (e.g., “Providing  
341 focused attention daily for activities such as reading and outdoor play”; 40% of goals). Given  
342 that we were interested in generalizable factors that influence how parents adapt other  
343 personally or functionally important goals in their lives, we did not restrict participants to  
344 selecting competing life goals from a particular domain. The most frequently reported  
345 competing life goals were health/fitness/wellness goals (e.g., “I want to maintain good fitness  
346 levels and exercise in some form every day”; 30% of goals). We provide a summary of the  
347 listed parenting and competing life goals in Supplementary Material.

348 After one week, participants began the experience sampling portion of the study in  
349 which they completed short surveys (diaries) every three days. Piloting established that this  
350 sampling frequency provided parents with enough opportunity to engage with their goals and  
351 minimized participant burden. We administered diaries for Australian participants using the  
352 SEMA3 app (Koval et al., 2019) and for the remaining participants through Prolific  
353 Academic and the Qualtrics survey platform. Diaries were sent out every three days for the  
354 following 30 days, with 10 diaries sent out in total. Participants received a notification via the  
355 SEMA3 app or Prolific Academic at 16:00 (local time) whenever a diary became available.  
356 Diaries remained available until 23:59 (local time). At the beginning of each diary  
357 participants were asked whether they were still pursuing their nominated parenting and  
358 competing life goal goals; if they responded negatively for either goal, they were instructed to  
359 set a new goal and re-rate their goal motives. Goals were automatically piped into the  
360 relevant sections of the diary to remind participants of their goal. Participants were then  
361 asked to reflect on their goal striving over the last three days. In the diaries, participants  
362 reported their goal progress, use of effort and disengagement coping strategies, goal

363 adjustment, and MCII-like cognitive features for the parenting goal and then for the  
364 competing life goal. Diaries also assessed the extent to which intergoal facilitation and  
365 interference occurred between the two goals. When responding to the questions, participants  
366 were instructed to reflect on their experiences over the last three days. Diaries took  
367 approximately 5 minutes to complete. On average, participants completed 7.13 out of 10  
368 diaries ( $SD = 2.38$ , Range = 2-10).

### 369 **Analysis Overview**

370 We conducted all analyses in Mplus (version 8.4; Muthén & Muthén, 2019). Prior to  
371 our main analysis, we carried out a multilevel confirmatory factor analysis with restricted  
372 maximum likelihood estimation (MLCFA) to test the viability of combining MCII-like  
373 cognitive features into a single score (see *MCII-Like Cognitive Features*). Given that these  
374 results are tangential to the main hypothesis, we present them in Supplementary Material.

375 To test our hypotheses, we constructed separate but identical models for each goal  
376 using two-level multilevel structural equation modeling (MLSEM; Preacher et al., 2010) with  
377 Bayesian estimation, which offers more flexibility and accuracy in terms of modeling  
378 interactions (Asparouhov & Muthén, 2021a). Between-person portions of the model indicate  
379 how variables predicted goal striving from one individual to another (e.g., how do motives  
380 and coping differentiate a successful individual from an unsuccessful individual). Within-  
381 person portions of the model indicate how variables predicted the measurement-to-  
382 measurement fluctuations experienced by an individual (e.g., how does self-regulatory coping  
383 differentiate an individual's successful instances of goal striving from their unsuccessful  
384 instances).

385 We modelled hypothesized cross-level interactions (i.e., Autonomous Motives  $\times$   
386 MCII predicting Disengagement Coping; Controlled Motives  $\times$  MCII predicting Goal  
387 Adjustment and Effort Coping) by having goal motives predict the random slopes that  
388 resulted from regressing MCII-like cognitive features at the between-person level on self-  
389 regulation variables at the within-person level (Zyphur et al., 2009). These interactions  
390 examine how goal motives (which are typically stable across long time periods; Healy et al.,  
391 2014) interact with MCII-like features to predict fluctuations within a person's day-to-day

392 goal striving. We controlled for the potential influence of number of children in a  
393 participant's family, hours of work, relationship status, and gender on goal outcomes (i.e.,  
394 goal progress/facilitation/interference).

395 It is theoretically possible for goal motives to predict goal progress, facilitation, and  
396 interference both directly and indirectly via their effects on coping (Gaudreau et al., 2012).  
397 To ascertain the most parsimonious model for the current data, we tested variations of the  
398 model that differed in the way motives and MCII directly predicted the outcome variables at  
399 the between- and within-person levels. We present details of this analysis and the results in  
400 Supplementary Material. We used the best fitting model to evaluate our hypotheses.

### 401 Results

402 We present in Table 1 between-person level descriptive statistics for variables  
403 measured for each goal. Omega coefficients provide separate internal reliability estimates at  
404 the within- and between-person levels (Geldhof et al., 2014). Model results pertaining to  
405 control variables are tangential to our hypotheses, and we provide them in Supplementary  
406 Material. We depict structural equation models and path coefficients for the parenting goal  
407 and competing life goal in Figures 1 and 2, respectively. We report indirect effects in the text.  
408 Full results, which include 95% credibility intervals for all path coefficients as well as control  
409 variables for both models, are available in Supplementary Material.

#### 410 Hypothesis Series 1 – Motives and Coping

411 Hypothesis series 1 predicted that autonomous motives would be associated with  
412 effort coping and goal adjustment, which in turn would be positively associated with progress  
413 (H1a), while controlled motives would be associated with disengagement coping, which  
414 would have negatives associations with progress (H1b).

415 The results for both goals partially support Hypothesis 1a. Although autonomous  
416 motives were not related to goal adjustment for either goal, effort coping mediated the  
417 relation between autonomous motives and goal progress at the between-person level (indirect  
418 effect for the parenting goal:  $\beta = .211$ , 95% CI = [.059,.378]; indirect effect for the competing  
419 life goal:  $\beta = .114$ , 95% CI = [.008,.249]). Controlled motives were related to disengagement  
420 coping, which was unrelated to goal progress at the between-person level and negatively

421 related to goal progress at the within-person level, partially supporting Hypothesis 1b for both  
422 goals.

### 423 **Hypothesis Series 2 – Multiple Goal Management**

424 Hypothesis series 2 predicted that autonomous motives, effort coping and goal  
425 adjustment would be associated with intergoal facilitation (H2a), while controlled motives  
426 and disengagement coping would be associated with intergoal interference (H2b).

427 Additionally, we predicted facilitation would be positively associated with progress and  
428 interference would be negatively associated with progress (H2c).

429 Hypothesis 2a was partially supported for the parenting goal at the between-person  
430 level. Autonomous motives had indirect effects on intergoal facilitation via effort coping ( $\beta =$   
431  $.067$ , 95% CI =  $[.007, .148]$ ) and disengagement coping ( $\beta = -.105$ , 95% CI =  $[-.194, -.010]$ ),  
432 but were unrelated to goal adjustment. Turning to the competing life goal, autonomous  
433 motives had an indirect effect on intergoal facilitation via effort coping at the between-person  
434 level ( $\beta = .179$ , 95% CI =  $[.049, .308]$ ); however, there was a lack of association between  
435 autonomous motives and goal adjustment. Thus, there was only partial support for  
436 Hypothesis 2a for the competing life goal.

437 Regarding Hypothesis 2b in the parenting goal model, controlled motives were  
438 associated with disengagement coping at the between-person level; however, there was no  
439 relation between disengagement coping and intergoal interference at this level. In contrast,  
440 we observed a positive association at the within-person level between goal disengagement  
441 and intergoal interference. Thus, we conclude that Hypothesis 2b is supported at the within-  
442 person level only for the parenting goal. For the competing life goal, disengagement coping  
443 was unassociated with intergoal interference at any level. Consequently, Hypothesis 2b was  
444 not supported at any level for the competing life goal.

445 Intergoal interference was related to goal progress at the between person-level for the  
446 parenting goal; however, the effect size of the path coefficient is smaller than that determined  
447 to be reliably detectable. Taking a conservative approach, we do not consider this effect  
448 further. There were no other associations between intergoal interference or intergoal



449 facilitation and goal progress at any level for either goal. Therefore, we conclude that  
450 Hypothesis 2c was unsupported.

### 451 **Hypothesis Series 3 – Effects of MCII-Like Cognition**

452 Hypothesis series 3 predicted that MCII-like cognitive features would be associated  
453 with effort coping, goal adjustment (H3a). We also predicted that interactions between MCII  
454 and goal motives would be related to self-regulatory coping strategies (H3b-c).

455 At the between-person level of the parenting goal model (top half of Figure 1), MCII-  
456 like cognitive features had a positive indirect effect on goal progress ( $\beta = .395$ , 95% CI =  
457 [.226,.545]) and intergoal facilitation ( $\beta = .134$ , 95% CI = [.026,.246]) via effort coping. We  
458 observed additional positive indirect effects of MCII-like cognitive features on intergoal  
459 facilitation via disengagement coping ( $\beta = .057$ , 95% CI = [ $<.001$ ,.131]) and goal adjustment  
460 ( $\beta = .146$ , 95% CI = [.039,.268]). We also obtained a non-hypothesized positive indirect  
461 effect of MCII-like cognitive features on intergoal interference via goal adjustment ( $\beta = .278$ ,  
462 95% CI = [.103,.443]). At the within-person portion of this model (bottom half of Figure 1),  
463 there were positive indirect effects of MCII-like cognitive features on goal progress via effort  
464 coping ( $\beta = .473$ , 95% CI = [.398, .549]), disengagement coping ( $\beta = .025$ , 95% CI =  
465 [.002,.046]), and goal adjustment ( $\beta = .088$ , 95% CI = [.055,.127]). Together, these results  
466 support Hypothesis 3a for the parenting goal.

467 Turning to the between-person component of the model for the competing life goal  
468 (top half of Figure 2), MCII-like cognitive features had a positive indirect effect on goal  
469 progress via effort coping ( $\beta = .539$ , 95% CI = [.343,.714]). MCII-like cognitive features also  
470 had positive indirect effects on intergoal facilitation via effort coping ( $\beta = .199$ , 95% CI =  
471 [.071,.320]) and via goal adjustment ( $\beta = .202$ , 95% CI = [.082,.309]). Again, MCII-like  
472 cognitive features had an non-hypothesized positive indirect effect on intergoal interference  
473 via goal adjustment ( $\beta = .204$ , 95% CI=[.099,.353]). For the within-person portion of the  
474 model (bottom half of Figure 2), MCII-like cognitive features had positive indirect effects on  
475 goal progress via both effort coping ( $\beta = .631$ , 95% CI = [.528,.717]) and goal adjustment ( $\beta$   
476 = .067, 95% CI = [.026,.113]) and on intergoal facilitation via effort coping ( $\beta = .046$ , 95%

477 CI = [.008,.085]) and goal adjustment ( $\beta = .047$ , 95% CI = [.006,.083]). These results support  
478 Hypothesis 3a for the competing life goal.

479 Cross-level interactions between MCII-like cognitive features and goal motives were  
480 not associated with any of the self-regulatory variables for the parenting goal. However, for  
481 the competing life goal, controlled motives at the between-person level were positively  
482 related to the within-person slope for the relation between MCII-like features and goal  
483 adjustment. Figure 3 depicts this interaction. Put another way, on occasions that people with  
484 strong controlled motives for their competing life goal reported using MCII-like features,  
485 they also reported making more adjustments to their goal. This interaction indirectly  
486 predicted goal progress within-persons ( $\beta = .008$ , 95% CI = [.001,.018]) but not intergoal  
487 facilitation ( $\beta = .006$ , 95% CI = [-.001,.013]), partially supporting Hypothesis 3b for the  
488 competing life goal. Hypothesis 3c was not supported for either goal.

### 489 Discussion

490 In the present study we use the framework of the Self-Concordance Model to draw a  
491 more holistic picture of parental goal striving. Our results provide an account of how MCII-  
492 like cognitive features and autonomous motivation predict effort-based coping strategies and  
493 adjustment, which in turn predict goal progress and intergoal facilitation.

494 At the between-person level, parents who strove for either parenting or competing life  
495 goals for autonomous reasons were overall more likely to use effective coping mechanisms,  
496 like exerting effort, which in turn helped them to experience greater overall goal progress. In  
497 contrast, controlled motivation predicted disengagement from the competing life goal and  
498 was unrelated to progress for either goal. These results extend key tenets of the Self-  
499 Concordance Model, which has previously been applied to a range of other life domains  
500 (Milyavskaya & Koestner, 2011), to parental goal striving.

501 According to the Self-Concordance Model, success with autonomously motivated  
502 goals should support basic psychological needs and contribute to wellbeing (Klug & Maier,  
503 2014; Sheldon & Elliot, 1999). By detailing how autonomous motivation conduces to  
504 successful goal striving, current results may also help to explain associations between  
505 autonomous parenting motivation and outcomes such as parental satisfaction, competence,

506 and autonomy-supportive parenting (Dieleman et al., 2021; Jungert et al., 2015), as well as  
507 why children of autonomously motivated parents report greater wellbeing and fewer  
508 behavioral problems (Jungert et al., 2015).

509         A key contribution of this work lies in demonstrating how self-regulatory coping  
510 relates to goal striving at the level of the individual. On occasions when a parent engaged in  
511 effort coping and goal adjustment, they reported more goal progress, whereas disengagement-  
512 based coping strategies were negatively associated with progress. These results extend prior  
513 work emphasizing the importance of exerting effort (Ntoumanis et al., 2014a; Smith et al.,  
514 2011) and adjusting goal striving (Brandtstädter & Rothermund, 2002) by demonstrating that  
515 these coping strategies differentiate more successful episodes of goal striving from less  
516 successful episodes. Most variation in goal progress across both parenting and competing life  
517 goals was attributable to within-person fluctuations, highlighting the often overlooked  
518 importance of investigating goal striving at the within-person level (Neal et al., 2017).

519         This study also produced novel insights into how motives and coping influence the  
520 management of competing goals. Goal adjustment combined with effort coping was related to  
521 greater overall intergoal facilitation for both goals; however, adjustment in the absence of  
522 effort coping (for the parenting goal) or in combination with defeat coping alone (for the  
523 competing life goal) was associated with intergoal interference. Although these results  
524 provide mixed support for our hypotheses, they are consistent with the wider literature.  
525 According to Brandtstädter and Rothermund's (2002) Dual Process Model, the degree to  
526 which assimilative (e.g., effortful persistence) and accommodative (e.g., disengagement and  
527 adjustment) modes of coping are adaptive depends on the goal and available resources. Our  
528 results suggest that adjusting striving is beneficial only when individuals have the capacity to  
529 dedicate effort to the adjusted goal (Haase et al., 2021; Herrmann et al., 2019).

530         We did not obtain compelling evidence that intergoal facilitation is associated with  
531 goal progress, nor that intergoal interference is negatively linked to progress at any level.  
532 Although successfully balancing goals through intergoal facilitation contributes to a more  
533 harmonious goal striving experience, the distribution of resources across goals may mean that  
534 facilitation is not always beneficial to progress (Kung & Scholer, 2021). Conversely,

535 intergoal interference may not necessarily undermine the ability to make progress on  
536 competing goals (Kung & Scholer, 2021; Segerstrom & Nes, 2006). For example, inadequate  
537 resources can be compensated for by engaging in sequential striving in which competing  
538 goals are momentarily paused in favor of the more demanding goal and resumed at a more  
539 convenient time point (Moshontz et al., 2019). Even when unrelated to goal progress, the  
540 importance of achieving intergoal facilitation should not be understated, as the ability for  
541 intergoal facilitation to promote wellbeing outcomes is relevant to the psychological health of  
542 parents and their dependent children (Jungert et al., 2015).

### 543 **Effects of Spontaneously Emerging MCII-Like Cognition**

544 Consistent with our third set of hypotheses, engaging in processes fundamental to  
545 MCII during goal striving was associated with greater goal progress and intergoal facilitation  
546 via effortful coping and goal adjustment. This builds on previous work indicating that  
547 spontaneously arising implementation intentions (Bieleke & Keller, 2021; Brickell et al.,  
548 2006) and mental contrasting (Sevincer & Oettingen, 2013) can independently promote goal  
549 progress. Few studies have considered MCII in the context of multiple goals, and those that  
550 did emphasized complementary rather than competing goals (Marquardt et al., 2017). The  
551 novel finding that spontaneously arising MCII-like features encourage intergoal facilitation  
552 for competing goals highlights the need for further research on the effectiveness of MCII for  
553 promoting multiple goal pursuit.

554 Research into whether MCII encourages accommodative goal striving through goal  
555 adjustment has been scarce. As an independent intervention, the mental contrasting  
556 component of MCII has an intuitive appeal for promoting accommodative goal striving  
557 (Oettingen & Gollwitzer, 2022), due the purported abilities of mental contrasting to modulate  
558 of goal commitment based on attainability (Kappes et al., 2013). Implementation intentions  
559 can also reduce goal commitment when the costs of goal striving are excessive (Legrand et  
560 al., 2017; Riddell et al., 2022). Regardless, previous research on the usefulness of combining  
561 mental contrasting and implementation intentions (i.e., MCII) has predominantly focused on  
562 advancing goal progress (Oettingen & Gollwitzer, 2010; Oettingen & Reininger, 2016). The  
563 present study suggests that MCII may also be effective for encouraging flexible goal striving.

564 Usage of cognitive components inherent in MCII had a stronger relation to goal adjustment in  
565 participants who reported high controlled motivation for their competing life goal. This is  
566 consistent with Ntoumanis and Sedikides's (2018) proposal that MCII may be most beneficial  
567 for the regulation of goals with controlled motives. Although we did not observe this  
568 interaction for the parenting goal, it is common for the pursuit of different goals to entail  
569 differing forms of self-regulation (Mann et al., 2013; Neal et al., 2017; Sansone & Thoman,  
570 2006). Because parenting goals are inherently related to the care of a child, they may be seen  
571 as less adjustable than goals in other life domains, even when they are not self-concordant.

572 We emphasize that the composite MCII-like features measure in the present study  
573 should not be equated to the usage of MCII. We cannot unambiguously rule out the  
574 possibility that participants engaged in components in a different order (e.g., reverse  
575 contrasting by reflecting on obstacles before fantasizing; Oettingen, 2012) or only engaged in  
576 some components of MCII (e.g., fantasizing or dwelling). Nonetheless, the current study  
577 provides evidence that spontaneously arising components of MCII are linked to both effortful  
578 coping and goal adjustment. Despite disparities between the present methodology and true  
579 MCII, these results are a positive indicator that MCII interventions could be effective for  
580 helping parents to manage competing goals. Importantly, self-regulation interventions are  
581 most effective when they fit individuals' natural inclinations (Peetz & Davydenko, 2021).  
582 This study indicates that many parents are already using some aspects of MCII and are  
583 therefore more likely to benefit from tailored parenting interventions based around MCII.

584 Actively training individuals in MCII can benefit goal striving in several contexts  
585 (Wang et al., 2021). MCII as a trained technique is more than the sum of its parts. Engaging  
586 in only some components of mental contrasting or engaging in mental contrasting in the  
587 wrong order (e.g., by contrasting obstacles in reality before fantasizing about a desired  
588 outcome) can be ineffective or even detrimental to goal pursuit (Oettingen, 2012). We  
589 conducted ancillary analyses to gauge whether dwelling on obstacles or indulging in fantasies  
590 about the future influenced the results (Supplementary Material). The pattern of results did  
591 not change for the parenting goal, but the relation between autonomous motives and effort  
592 was no longer significant for the competing life goal after removing instances of either

593 dwelling or indulging. Indulging and dwelling can deplete resources for goal striving  
594 (Oettingen & Reiniger, 2016). When these cognitive patterns are present, other factors, such  
595 as autonomous motivation, may be particularly important for promoting effort. Follow-up  
596 research will do well to validate our measure of spontaneously occurring MCII and to address  
597 relations between motives and alternative cognitive patterns (e.g., indulging/dwelling).

### 598 **Strengths, Limitations, and Future Directions**

599         The bulk of the literature has considered goal striving at the between-person level.  
600 Our study used experience sampling to examine coping processes in goal striving at both the  
601 within- and between-person levels, which is necessary given the large within-person  
602 variability in goal progress, facilitation, and interference observed here. By investigating  
603 multiple goals, we were able to compare how these processes differentially influence goal  
604 striving in distinct but interrelated life contexts.

605         Nevertheless, our work has limitations. First, the data are correlational and relied on  
606 self-reported data. We based our models on theory (Ntoumanis & Sedikides, 2018; Sheldon  
607 & Elliot, 1999), but we cannot directly infer causality. Experimental evidence indicates that  
608 MCII and goal motives can influence goal progress (Sheeran et al., 2020; Wang et al., 2021).  
609 Regardless, further work is needed to establish causal relations between the model variables.  
610 Second, to minimize potential recall biases and reduce participant burden, we did not ask  
611 participants to recall the order in which they engaged in MCII-like cognitions. Consequently,  
612 the features we measured represent key cognitive components of MCII, but should not be  
613 conflated with MCII as a trained exercise. Additionally, our measures may have been limited  
614 by inaccuracies due to poor access to internal thought processes or unreliable recall (Nisbett  
615 & Wilson, 1977). Additional empirical validation is needed to assert whether high usage of  
616 the three cognitive features measured here (mental imagery, reflection on obstacles, use of  
617 implementation intention planning) is predictive of spontaneous usage of true MCII.  
618 Researchers have used text-based analysis to infer spontaneously occurring mental  
619 contrasting (Sevincer & Oettingen, 2013). This was not feasible given our experience  
620 sampling methodology, but represents an alternative method for assessing spontaneous MCII  
621 and could be useful for validating the approach used here. Finally, a large number of

622 participants dropped out of the second measurement burst. An additional measurement burst  
623 would have allowed us to establish our models longitudinally and test how participants shift  
624 their goal striving strategies as they face new challenges. Implementing the intended dual  
625 measurement burst would provide a richer picture of multiple goal striving in parents and  
626 should be re-attempted in the future.

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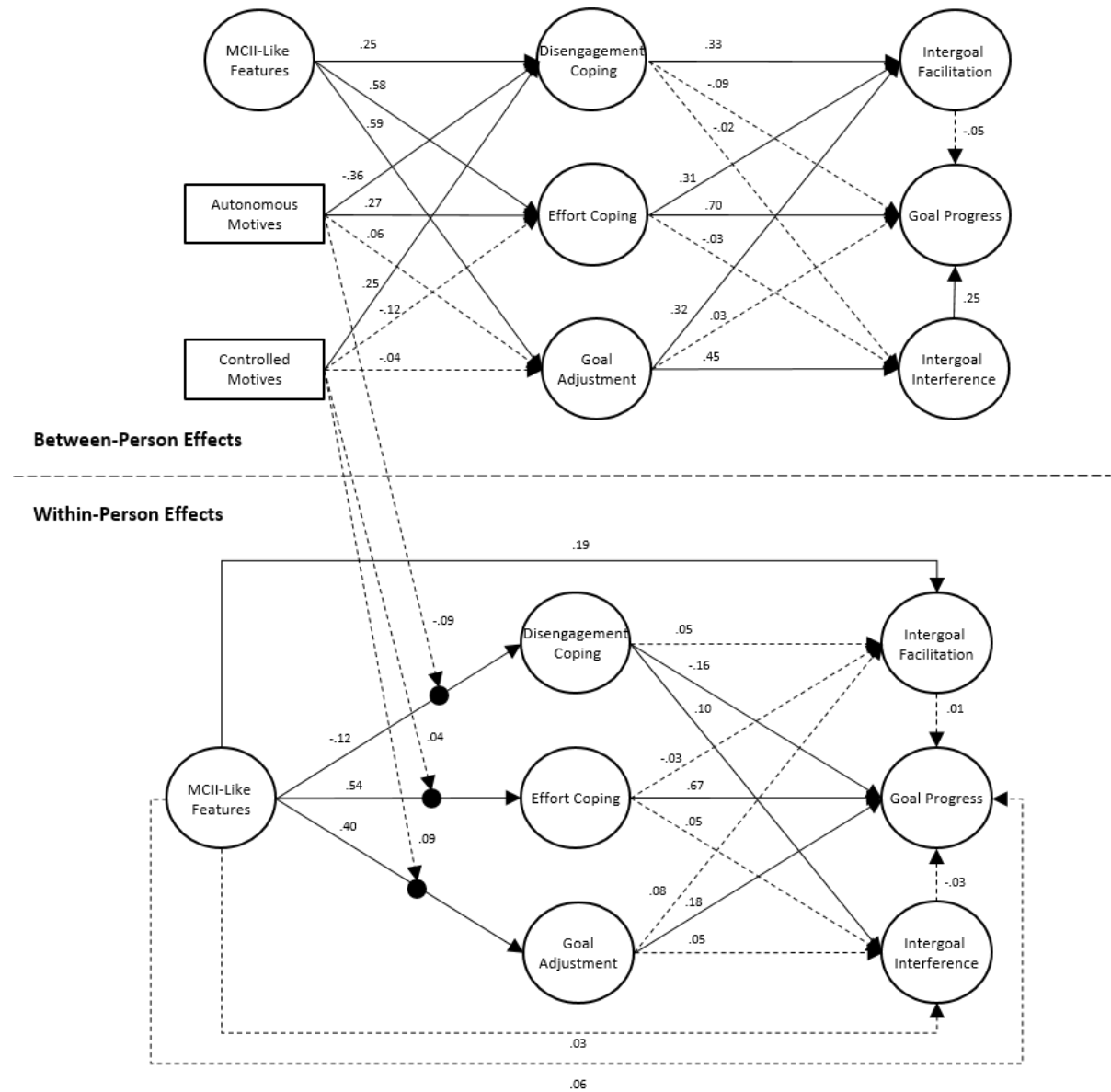
**Table 1***Group Level Descriptive Statistics and Within/Between-Person Internal reliability Estimates**( $\omega$ ) for Measures Relating to the Parenting and Competing Life Goal*

	Parenting Goal				Competing Life Goal			
	<i>M</i>	<i>SD</i>	$\omega_{\text{within}}$	$\omega_{\text{between}}$	<i>M</i>	<i>SD</i>	$\omega_{\text{within}}$	$\omega_{\text{between}}$
Goal Progress	4.125	1.649	.926	.986	3.390	1.829	.926	.986
Intergoal Facilitation*	1.862	1.020	.762	.937	1.862	1.020	.762	.937
Intergoal Interference*	2.263	1.326	.836	.971	2.263	1.326	.836	.971
Effort Coping	4.300	1.776	.942	.989	3.409	1.935	.942	.989
Disengagement Coping	2.010	1.289	.851	.976	2.539	1.665	.908	.988
Goal Adjustment	2.612	1.152	.879	.986	2.352	1.139	.891	.980
MCII-Like Cognitive Features	3.212	1.413	.892	.928	3.327	1.457	.904	.955
Autonomous Motives	5.760	.873		.773	5.572	1.125		.796
Controlled Motives	4.215	1.084		.725	4.174	1.440		.760

*Note:* \*Single measure for both goals.

**Figure 1**

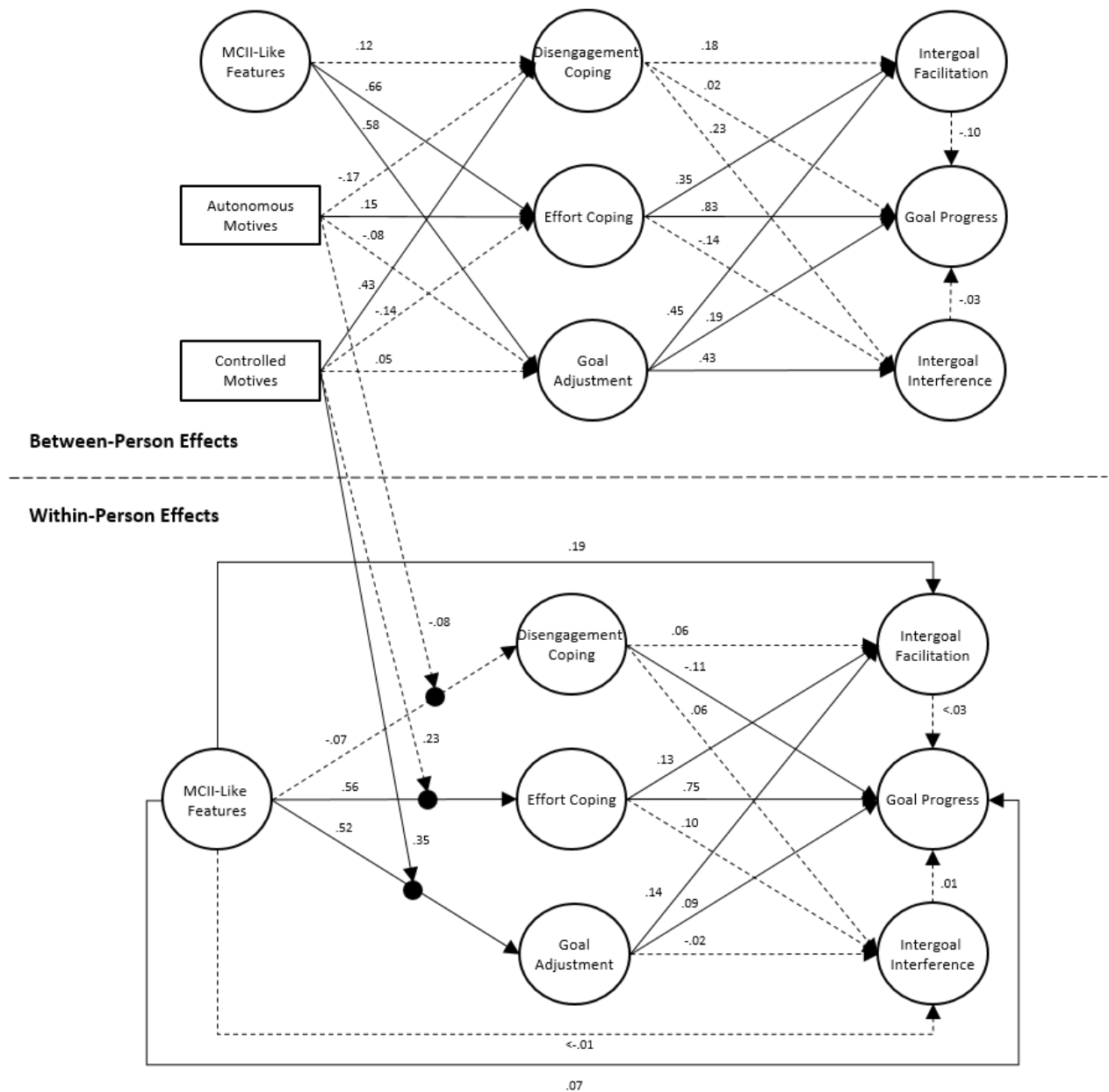
*Multilevel Structural Equation Model for the Parenting Goal*



*Note:* Rectangles represent measured variables, labelled circles represent latent variables. Filled circles on lines represent the presence of cross-level interactions between goal motives and MCI-like features. Solid lines represent significant paths (95% credibility intervals do not include zero); broken lines represent non-significant paths. Control variables have been omitted for clarity.

**Figure 2**

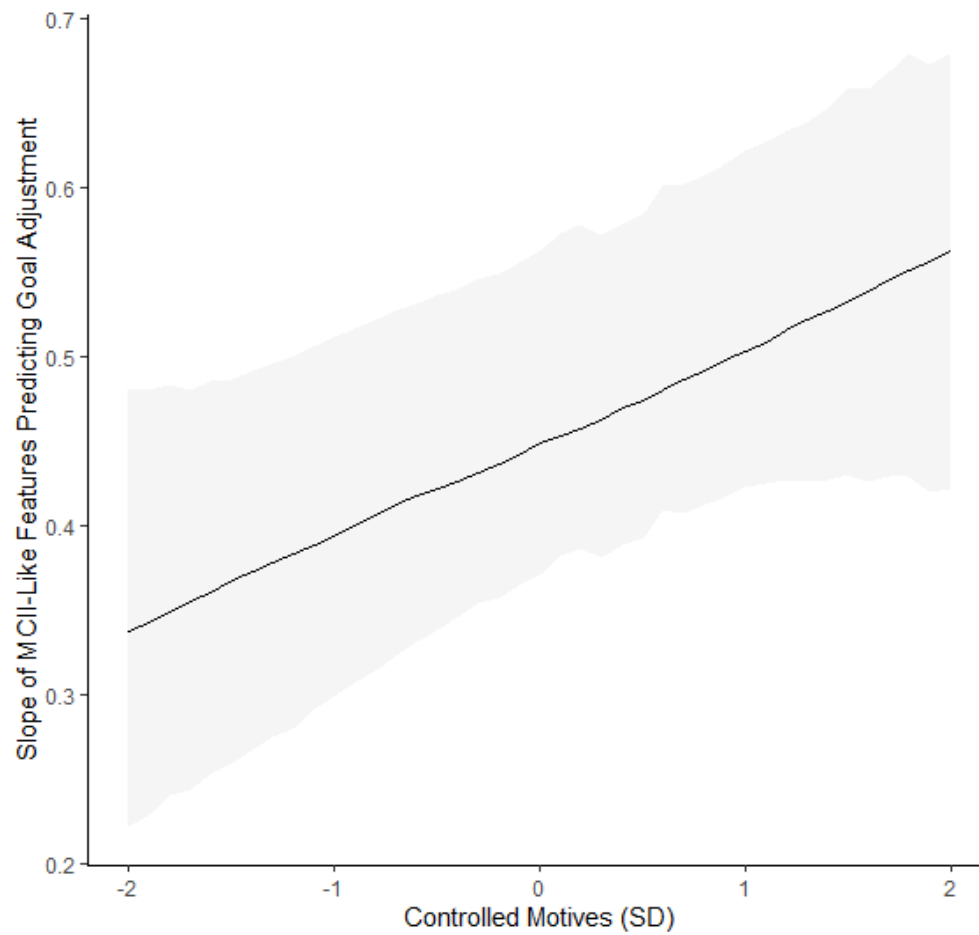
*Multilevel Structural Equation Model for the Competing Life Goal*



*Note:* Rectangles represent measured variables, labelled circles represent latent variables. Filled circles on lines represent the presence of cross-level interactions between goal motives and MCI-like features. Solid lines represent significant paths (95% credibility intervals do not include zero); broken lines represent non-significant paths. Control variables have been omitted for clarity.

**Figure 3**

*Cross-Level Interaction Between MCII-Like Features and Controlled Motives Predicting Ease of Goal Adjustment for the Competing Life Goal*



*Note:* Shaded Area Represents 95% Credibility Interval.