A longitudinal examination of the interactive effects of goal importance and self-efficacy upon multiple life goal progress

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1   Abstract

2   The present paper examines the interactive effects that goal importance and self-efficacy may

3   exert upon the progress of multiple life goals. Personal goal progress in an adult sample ($N = 76$)

4   were examined over a 12 week period. In accordance with previous research, it was hypothesised

5   that when goal importance is high, self-efficacy will have a positive effect upon goal progress.

6   However, when goal importance is low, self-efficacy should have a weaker effect upon goal

7   progress. Results found the hypothesised interaction between goal importance and self-efficacy.

8   Findings extend beyond previous laboratory based research where goal importance moderates the

9   positive effects of self-efficacy by examining such effects in a real life multiple goal environment.

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1   The effect of personal goals upon behavior has received much empirical attention (Brunstein,

2   1993; Elliot & Thrash, 2002; Emmons, 1986; Little, 1989; Locke & Latham, 1990). Personal goals

3   have been described as "consciously articulated, personally important objectives that individuals

4   pursue in their daily lives; they are self-investments that provide individuals with a sense of

5   purpose, structure, and identity" (Elliot, Sheldon, & Church, 1997, p. 915). When such goals are

6   created, individuals are thought to focus on positive outcomes where goal orientation involves

7   trying to reduce the discrepancy between the present state and a desired end state (Bandura, 1991;

8   Carver & Scheier, 1998; Powers, 1973; Vancouver, 2008).

9   Research investigating how individuals adopt and pursue goals has paid particular attention to

10   self-efficacy theory (Bandura, 1986). Self-efficacy refers to the belief that one is capable of

11   organising and executing the courses of action required to achieve desired levels of attainment.

12   Research has shown that individuals with high levels of self-efficacy are more likely to: increase

13   on-task effort (Bandura & Cervone, 1983); be more committed to goals (Locke, Frederick, Lee, &

14   Bobko, 1984; Locke & Latham, 1990); choose more difficult goals and tasks (Chase, 2001; Escarti

15   & Guzman, 1999; Waung, MacNeil, & Vance, 1995); make greater goal progress (Sheldon &

16   Kasser, 1998); intensify effort when accomplishments fall short of aspirations (Peake & Cervone,

17   1989); and show higher levels of task engagement (Caraway, Tucker, Reinke, & Hall, 2003;

18   Walker, Greene, & Mansell, 2004).

19   However, one limitation of self-efficacy research in relation to goals is that it has typically

20   focused on single goal tasks (see Bandura, 1997). As such, less is known about how self-efficacy

21   affects progress when individuals are faced with multiple goals. Bandura (1997) would argue that

22   self-efficacy is a main precursor of goal choice, resources committed and goal progress. However,

23   in a multiple goal environment Vancouver, Thompson, and Williams (2001) argue that "if limited

resources are required to maintain two goals, beliefs that one goal is being met frees up resources

for the other goal" (p. 617). Therefore, if individuals with high efficacy beliefs regarding goal

attainment believe they are meeting their goal, they may devote less resources and commitment to

that goal and instead, focus their attention on other goals that they are less confident in obtaining

(especially if the other goals are personally important).

Research suggests that goal importance has its own motivational properties in relation to goal

pursuits. For example, Gollwitzer (1993) asserted that goal importance influences the amount of

commitment an individual will devote to their goals. Hollenbeck and Williams (1987) found that

goals high in self-focus and importance were associated with higher performance (increased sales).

Also, Seijts, Meertens, and Kok (1997) found a significant interaction between goal difficulty and

importance with regard to public speaking; very difficult goals on important presentations led to

significantly higher performance than very difficult goals on unimportant presentations. King,

Richards, and Stemmerich (1998) also found a significant and positive correlation between goal

importance and daily goal progress. Further, research has shown that individuals will engage in task

relevant behaviours when the task is perceived to be important (e.g., Ingledew, Wray, Markland, &

Hardy, 2005; Yukl, Kim, & Chavez, 1999; Yukle, Kim, & Falbe, 1996).

Interactive effects between goal importance and self-efficacy have also been shown to predict

goal progress. Orbell, Johnston, Rowley, Davey, and Espley (2001) investigated these interactive

effects upon 32 differing physical mobility movements before and after joint (knee or hip)

replacement surgery. The interaction revealed that when post-surgery self-efficacy (measured at 3

months post operation) was high, goal importance (measured pre-surgery) had a slight positive

impact on overall progress measured at 9 months. However, when post-surgery self-efficacy was

low, goal importance had a much stronger positive influence over progress measured at 9 months.

1   Thus, according to Orbell et al.'s findings, self-efficacy moderates the positive effects of goal

2   importance upon goal progress. They further argued that interventions should focus on enhancing

3   goal importance. However, self-efficacy measured pre-surgery did not interact with goal importance

4   measured pre-surgery on overall progress (9 months post-surgery). Further, limitations exist in that

5   Orbell et al. used an overall mean self-efficacy and goal importance score of the 32 differing

6   activities measured, therefore competing activities in relation to self-efficacy and goal importance

7   were not examined.

8   In a multiple goal environment context, Kernon and Lord (1990) examined the interactive

9   effects of goal expectancy (estimated chances of reaching the goal) x goal valence (valence was

10   manipulated by monetary incentive). The prediction of expectancy x valence theory is that goal

11   commitment will be at its highest when both expectancy and valence are high. Further, if one is

12   pursuing multiple goals, goals may be prioritised based on expectancy and valence beliefs. To test

13   this theory, Kernan and Lord (1990) examined competing and multiple goals in a clerical task (e.g.,

14   selling, rotating and keeping track of stock). They found that when goals had low valence or

15   importance, expectancy had little effect upon goal priority. However, under conditions of high goal

16   valence (importance), as expectancy increased, goal priority increased. Therefore, goal importance

17   (or valence) moderated the effect of outcome confidence on progress in a multiple goal

18   environment. However, in their multiple goal condition, Kernan and Lord (1990) only examined

19   two competing goals and under laboratory conditions. Further, Kernan and Lord only examined

20   goal priority over a very short period of time (approx. 30 minutes) and much less are known about

21   how valence and expectancy influence goal progress over a sustained period of time. Recent

22   research that have further examined multiple goals also use the dual goal/task paradigm in a lab

23   setting under short durations (e.g., Schmidt & DeShon, 2007; Schmidt, Dolis, & Tolli, 2009;

1   Vancouver, Weinhardt, & Schmidt, 2010). Hence, testing the valence expectancy model by

2   extending the dual goal paradigm task in a longitudinal study using actual life goals is warranted.

3   A further strength of using real life goals is that real life will impose various constrictions on goal

4   choice that will also influence goal progress. Further, participants are completely free to choose

5   amongst their own goals rather than being constrained by laboratory assignments. For example, an

6   individual may choose goals that they *want* to pursue, or goals that they *need* to pursue (e.g., Austin

7   & Vancouver, 1996) rather than completing an assigned laboratory task.

8   The present study only set to examine the interactive effects of self-efficacy and goal

9   importance in a multiple goal environment with adult life goals over a 3 month period. According

10   to a valence-expectancy models (e.g., Kernan & Lord, 1990) goal importance should interact with

11   self-efficacy to predict goal progress. Specifically, when goal importance is low, self-efficacy

12   should have little effect upon goal progress (as important goals are prioritised). However, when

13   goal importance is high, self-efficacy should have a strong and positive effect upon goal progress.

14   Method

15   *Participants*

16   One hundred and two participants (55 men, 47 women) from the UK volunteered to take part

17   in the study. They ranged in age from 20 to 70 years, mean = 39.4, SD = 14.5. All participants gave

18   informed consent prior to data collection. Participants were contacted and recruited through post-

19   graduate students who were paid £5 per completed participant. Although the participants were not

20   paid for their time, they were provided with the opportunity for feedback concerning their

21   individual goal diary and the results of the study. Of the 102 participants, 76 (35 Men, 41 Women,

22   mean age = 39.3 years, SD = 14.6) completed the survey at Time 1 and also reported on goal

23   progress 12 weeks later. Thus women were more likely to complete the study than men, chi-square

1   (1) = 7.43, N = 102, p = .006, V = .27. Information on participants' education, social class, and

2   ethnicity was not collected.

3   *Measures*

4   *Personal Project Analysis.* A modified version of Little's (1983) Personal Project Analysis

5   (PPA) was used to record goals, goal importance, and goal progress. On the first page, the

6   instructions for completing the PPA were slightly extended from Little (1983) and read:

7   We are interested in studying the kinds of personal projects that people have at different

8   stages of their life. All of us have a number of personal projects at any given time that we

9   think about, plan for, carry out, and sometimes (though not always) complete. Please think

10   about the projects or goals that you are currently working on.

11   We then provided participants with some examples of goals, such as: "Being more successful in my

12   relationships"; "Finding a full time job."

13   On the second page, participants wrote down all the goals that they were currently working

14   toward or thinking about working toward in the near future. On the third page, they were instructed

15   to write out the five goals that they were most likely to engage in over the subsequent three months.

16   We only asked for five goals to be rated in order to gain maximum recruitment retention. Alongside

17   this, goal importance ("How important to you at the present time is each goal?") and goal progress

18   ("How much progress have you made so far with your goal?)" were measured. Responses were

19   made on a 11-point Likert scale (0 = *not at all important/no progress to* 10 = *extremely*

20   *important/most progress).*

21   *Personal Project Self-efficacy.* Participants rated their self-efficacy regarding the attainment

22   of each goal. We used a slightly modified version of self-efficacy measures used in previous studies

23   (e.g., Sheldon & Kasser, 1998). Self-efficacy magnitude was recorded by asking the participants to

1   rate whether they had the skills and resources to perform at 10 different levels for each goal (i.e., "I

2   have the skills and resources to be 10% successful at achieving this goal"; "I have the skills and

3   resources to be 20% successful at achieving this goal"; until "I have the skills and resources to be

4   100% successful at achieving this goal"). Thus, a magnitude score of 0 to 100 (in increments of 10)

5   could be recorded for each project (i.e., if an individual reported *yes* to the first 7 levels, he/she was

6   attributed a score of 70%).

7   Self-efficacy strength was recorded by asking the participants to, "Rate your degree of

8   confidence in being able to attain this level of performance on a scale of 0-100%". That is, for each

9   magnitude level that the respondent answered *yes* to, they had to rate how confident they were of

10   obtaining that level of performance. However, as self-efficacy strength results mirrored the findings

11   to that of self-efficacy magnitude, only self-efficacy magnitude results are subsequently reported.

12   *Procedure*

13   After initial contact was made further information with regards to the nature of the study were

14   provided. After agreement and consent was granted to participate in the study, the PPA was sent out

15   to the participant that included all measures (i.e., current goal progress, importance and self-

16   efficacy) and was returned via pre-paid envelopes. Goal progress was assessed again 12 weeks

17   later. The final PPA was returned via pre-paid envelope.

18   *Analysis*

19   As goals were nested within participants hierarchical linear modelling (HLM; Raudenbush

20   & Bryk, 2002) Version 7 was used. Nested data structures make single-level regression analyses

21   problematic (Beck & Schmidt, 2012). The advantage of linear modelling is that it allows the

22   estimate of individual slopes and intercepts for each Level-2 unit (i.e., participants) across Level-1

23   units (e.g., goal progress, self-efficacy and goal importance). All variables were treated as random

1   effects (see Barr, Levy, Scheepers, & Tily, 2012). Further, person (group) mean centering was used

2   for all variables. Progress at Time 2 was used as the outcome variable within the model. The

3   following predictor variables were entered in the following order: (1) Progress at Time 1; (2) Self-

4   efficacy; (3) Goal importance; and (4) Self-efficacy x Importance interaction term.

5   Results

6   *Self-efficacy and goal importance predicting goal progress*

7   The 76 participants provided a total of 375 goals (M = 4.9 goals per participant). A variety of

8   types of goals were reported by the participants (e.g., "Pass my driving test"; "Have a successful

9   wedding day"; "Find a full time job"; Recover from cancer"; "Save for a holiday"; "Stick to my diet

10   and lose weight"; "Pass my exams"; "Get out of debt"; "Get more exercise"; "Be a better parent"

11   and "To take better care of my parents").

12   Table 1 shows the means, standard deviations and average bivariate correlations and intra-

13   class correlations among the study variables. To examine the between person correlations, all

14   correlations were based upon the 76 cases. That is all data was averaged within person before

15   correlations were calculated. Across participants, progress at Time 1 and goal importance

16   significantly correlated with progress at Time 2. However, self-efficacy failed to significantly

17   correlate with progress at Time 2. Before computing the interaction term, each variable (goal

18   importance, self-efficacy, and goal progress at Time 1 and Time 2) was standardized across

19   participants (Jaccard, Turrisi, & Wan, 1990). To examine if multilevel modeling was appropriate,

20   the proportion of variance that was accounted for by the between group effect (across level 2 units

21   i.e., participants) intraclass correlations (ICC) were calculated for all variables (see Table 1).

22   As shown in Table 2, goal progress at Time 1 significantly predicted goal progress at Time 2.

23   Self-efficacy significantly predicted progress at Time 2 above progress at Time 1, and goal

1 importance significantly predicted later goal progress above progress at Time 1 and self-efficacy.

2 Finally, the product term (self-efficacy x importance) significantly predicted variance in goal

3 progress at Time 2 over and above the main effects (see Table 2 and Figure 1). Figure 1 shows that

4 when goal importance is high self-efficacy has a positive relationship upon goal progress, but when

5 goal importance is low, self-efficacy appears to play no role in goal progress. To examine any

6 potential gender and age effects, the HLM analyses was rerun with gender and age as a level 2

7 variable. However, no moderating effects occurred.

8   Discussion

9   The purpose of the present study was twofold. First, we sought to re-test previous research in

10 multiple goal environments by examining the interactive effects of self-efficacy and goal

11 importance (e.g., Kernan & Lord, 1990; Orbell et al., 2001) using actual life settings as opposed to

12 lab settings. Second, we extended the number of goals usually examined from 2 to 5 and examined

13 goal progress over a 3 month period. According to Bandura (1977, 1986) high levels of self-

14 efficacy should be a strong and significant predictor of goal progress. However, previous research

15 has shown that goal importance (valence) may moderate that relationship (e.g., Kernan & Lord,

16 1990). Results found a significant two-way interaction between goal importance and self-efficacy

17 where self-efficacy only had a positive effect upon goal progress when goals were important.

18 Interestingly, no progress was made on unimportant goals over the course of the 3 month period

19 regardless of self-efficacy levels. These results support that of valence expectancy models in a

20 multiple goal environment (e.g., Kernan & Lord, 1990).

21   At the between person level, self-efficacy failed to significantly correlate with progress at

22 Time 2. However at a within person level, support for self-efficacy theory was shown in that self-

23 efficacy magnitude significantly predicted goal progress at Time 2 above that of goal progress at

1   Time 1 and accounted for 9% of the variance. This finding also supports a within person effect, in

2   that self-efficacy predicted a significant amount of variance upon subsequent performance when

3   previous performance accomplishments were accounted for (Bandura, 2012). However, the

4   interaction showed that this effect only occurred under high goal importance. It seems that when

5   goals are less important self-efficacy loses its positive effect. Goal importance significantly

6   predicted goal progress at Time 2 above that of previous progress and self-efficacy and accounted

7   for an additional 17% of the variance. Further, Table 1 shows that goal importance and self-efficacy

8   demonstrated a high level of discriminant validity with a correlation of $r = .06$. Thus the present

9   study adds further support that goal importance or valence should be regarded as an important

10 variable in influencing goal progress.

11   The interaction in the present study also differed to that of Orbell et al. (2001) findings.

12 Orbell et al. found that high levels of self-efficacy had a strong impact upon progress in mobility

13 regardless of goal importance. In the present study, self-efficacy only had a positive effect upon

14 goal progress when goal importance was high. There are two major differences between the present

15 study and that of Orbell et al. First, Orbell et al. did not examine competing goals as they summed

16 self-efficacy and goal importance scores across 32 functional activities. This provides one score for

17 each independent variable at each time point (in essence reducing their data set from 32 functional

18 activities to an overall mean function activity score). Secondly, Orbell et al. examined self-efficacy

19 and goal importance over various time points from 2 weeks pre-surgery to 3 and 9 months post-

20 surgery. Their interaction occurred with goal importance measured pre-surgery and self-efficacy

21 measured 3 months post-surgery. In this case, self-efficacy beliefs measured 3 months post-surgery,

22 would have been strongly influenced by progress over those 3 months. However, it is also unclear

23 in the present study how long participants were engaged with their current goals in order to make

1   accurate self-efficacy judgements. As Bandura (1997) states, "the goals people set for themselves at

2   the outset of an endeavour are likely to change, depending on how they construe the pattern and

3   level of progress they are making" (p. 129). It is therefore likely that previous experiences

4   combined with fluctuations in subsequent self-efficacy beliefs and goal importance across time will

5   determine how strong the moderation may be. Therefore, to further clarify the present findings

6   multiple time points should be used to examine such possible fluctuations across time.

7   Although goal importance significantly predicted progress over and above self-efficacy,

8   research suggests that this may not be the sole variable to do so. For example, Sheldon and Kasser

9   (1998) found that social and self-regulatory skills were more strongly related to goal progress than

10 self-efficacy. Recent research also shows that goal discrepancies, expectancies, and difficulty also

11 show dynamic relationships in a multiple goal domain (e.g., Schmidt & Dolis, 2009; Schmidt et al.,

12 2009; Vancouver et al., 2010). For example, Schmidt et al. (2009) found that in a dual goal

13 environment, if the task was not completely in the control of the participants (volatile), more time

14 was allocated to whichever goal was most discrepant (if time was not an issue). However, if time

15 ran short, participants in the volatile environment allocated more time to the least discrepant goal.

16 Other research suggests that ability, control, enjoyment, feedback, importance to others,

17 measurability, success expectations and goal value are also positively linked to goal commitment

18 (Ingledew et al., 2005). Future research should also consider how these later variables may interact

19 in predicting goal commitment and engagement.

20   Future research should also further consider the motivational reasons for goal choice. For

21 example, the self-efficacy ratings in the present study may only relate to predictions of achievement

22 but not directly causing the achievement. This is in line with Hawkins (1992) who asserts that self-

23 efficacy may be a predictor of behaviour but not necessary a cause, in that, "self-efficacy is not

1   suddenly present 'de novo' but has been determined by prior events" (p. 255). In other words, goal

2   engagement can occur regardless of efficacy beliefs (e.g., Austin & Vancouver, 1996). It's highly

3   probable that people choose to pursue goals for a variety of reasons some of which are mentioned in

4   the previous paragraph. Perhaps the reason for pursuing a goal would be its strongest predictor of

5   goal progress (be it efficacy expectation, importance, needs or any other form of motivation).

6   Further studies are warranted to examine the possible moderating role of goals that one *needs*

7   to engage with rather than those that one *wants* to engage with (e.g., Austin & Vancouver, 1996).

8   For example, the goal of "Pass my driving test" may be embedded as a *need* goal (I need a license

9   in order to get a job) or a *want* goal (I want my license in order to gain more freedom) or indeed a

10   mix of both. If the person is pursuing such a goal and perceives it as a need (i.e., to get a job), then

11   clearly self-efficacy is not a cause of goal choice and even less likely to relate to goal progress.

12   Therefore, a *need* goal may also be a moderating variable in the self-efficacy and progress

13   relationship. However, if it is a *want* goal, it is likely that the person may engage and disengage

14   with it across time irrespective of importance (as attention is drawn to other important goals) but

15   efficacy may play a more influential role. However, it was not possible to further examine the

16   possible moderating effect of *needs* and *wants* as it is difficult to determine the underlying reasons

17   for goal choice in the current study.

18   To sum, the present study specifically set out to test and extend Kernan and Lord's (1990)

19   study to examine the interactive effects of goal importance and self-efficacy in a real life setting,

20   using a higher number of personal goals across a longer time frame. Limitations of the present

21   study are that self-efficacy expectations in regard to goal attainment were only measured at the start

22   of the study and may have significantly changed over the 3 months, which may have influenced

23   their relationship with goal progress. Therefore, future studies should take fluctuations in self-

1   efficacy levels and importance across time into consideration. Another limitation is that goal

2   discrepancies were not accounted for. For example, in highly volitional goal environments, when

3   time is of the essence attention are generally driven to goals with the smallest discrepancy (e.g.,

4   Schmidt et al., 2009). It should be acknowledged that as discussed, there are a large number of

5   'other' moderating variables that influence the self-efficacy and performance relationship. Finally,

6   it should be noted that no information was gathered about social class, education, ethnicity, income,

7   employment etc. that may influence the resources that one has at their disposal. For example, many

8   of the goals reported require a financial contribution where income and employment would enhance

9   goal progress. However, it is likely that participants set goals that were within their means and the

10   goals that they set were perhaps reflective of their current situation.

11   The purpose of this study was only to examine Kernan and Lord's (1990) model in real life

12   where numerous amount of choices exist and where numerous other variables impose upon goal

13   progress. Replicating such findings is a testament to such models. Finally, the present study only

14   examined growth trajectories over 2 time points (albeit 3 months apart) which may be inadequate

15   for examining growth over time (Raudenbush & Bryk, 2002). Future research should consider

16   multiple time points to examine growth. To conclude, strong support was shown for valence

17   expectancy model of behaviour in that self-efficacy combined with high goal importance had a

18   strong and positive influence upon progress.

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1   Table 1

2

3   *Average bivariate correlations means and standard deviations of study variables across the 76*

4   *participants (i.e., correlations are based on a sample of 76)*

5

Variable	Mean	SD	ICC	1	2	3
Progress time 1	3.6	2.4	.26			
Progress time 2	5.2	2.8	.23	.71***		
S-efficacy magnitude	82	19	.17	.21p	.14	
Importance	7.6	1.9	.19	.23*	.34***	.06

6   p = .06; * *p* < .05; ** *p* < .01; *** *p* < .001.

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1   Table 2

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3   *Step-wise main and interactive effects of the average level-one regression coefficients (i.e., gamma*
4   *values) upon goal progress at Time 2.*

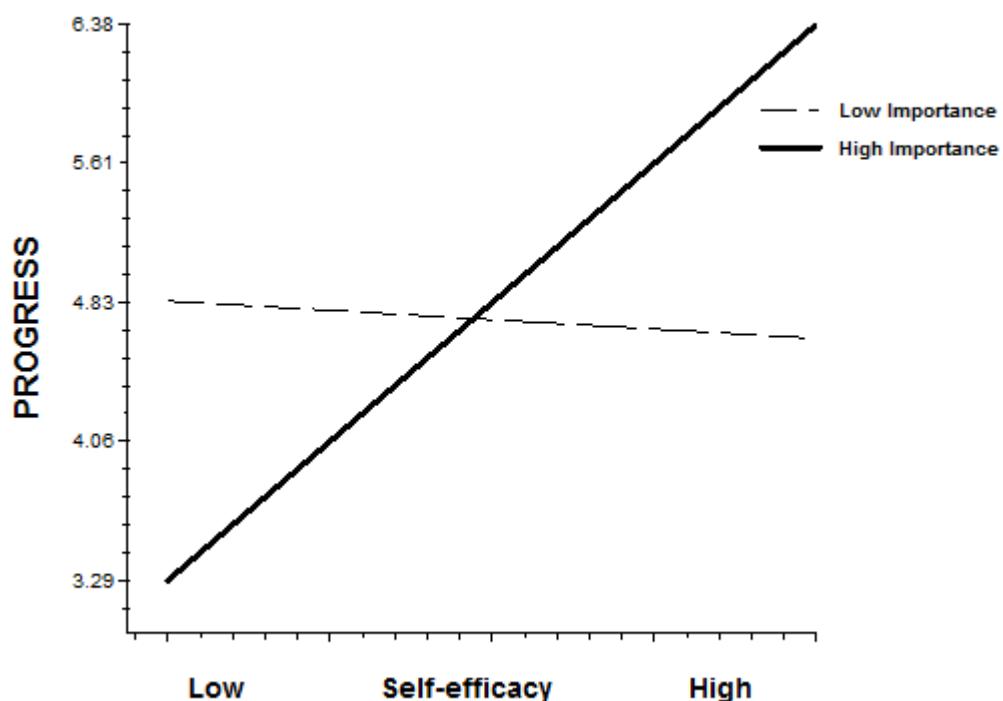5

Progress at time 2 as an outcome variable

Step	γ	SE	df	%Var	Δ%Var
1. Progress at time 1	0.56***	.06	75	34	
2. Self-efficacy magnitude	0.12*	.05	75	40	9
3. Goal importance	0.19**	.04	75	50	17
4. S-efficacy x Importance	0.12**	.04	75	54	9[1]

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

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[1] The reader will note that there are discrepancies between the total variance accounted for and the delta variances. Although it isn't possible to obtain a true R-squared value in HLM, it is possible to obtain an estimate. The total level 1 variances are calculated by the following recommended method (unrestricted error – restricted error) / unrestricted error. The delta variances are calculated by for example (restricted error 1 – restricted error 2) / restricted error 1). Therefore, these variances should be interpreted with caution and as an estimation of total variance that may be explained not absolute.

1   Figure Captions

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3   *Figure 1.* Regression slopes (± 1 *SD*) showing the moderating effects of goal importance upon

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5   self-efficacy and goal progress.

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