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Self-Regulatory Consequences of Observing Others Making Goal Progress: A Longitudinal Field Study in Weight Loss Groups

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Self-regulatory consequences of observing others making goal progress: A longitudinal field study in weight loss groups

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Abstract

Objective. What happens when people see others making progress toward a goal that they also hold? Is it motivating or could it undermine goal pursuit because people feel that they have made progress themselves (i.e., they experience *vicarious goal satiation*)?

Methods. We investigated these questions in a longitudinal field context – a group weight loss programme. $N = 132$ participants who were overweight or obese and attended weekly weight loss classes completed questionnaires over 11 weeks to investigate the consequences of observing other people making progress toward their goal of losing weight.

Results. Observing others making good progress was associated with participants holding stronger intentions to lose weight themselves ($B = 0.04$, $p = .012$), positive goal-related affect ($B = 0.27$, $p = .017$), and feeling that they were also making progress themselves ($B = 0.22$, $p < .001$). However, observing others making good progress was also associated with losing a smaller amount of weight over the following week ($B = .13$, $p = .005$). Mediation analyses

showed a significant indirect effect of observing others making good progress, via feelings about their own progress, on changes in weight, B = .02, 95% CI [.00, .04].

Conclusions. People who view others making progress tend to be less successful at losing weight themselves over the following week. The findings suggest that this is, in part, explained by the person feeling as if they have made progress themselves; thereby providing the first demonstration of vicarious goal satiation in a field context.

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Introduction

Many goals are pursued in the company of others. Friends train for marathons with each other, colleagues share offices while working towards their own deadlines, and people join groups with others who are trying to lose weight. People receive information about how others are doing with respect to their goals in person, and via the television, books, word of mouth, and social media. For example, an old college friend might tweet that he is 30 days smoke-free, while a celebrity's Facebook page details her weight loss journey following pregnancy. The consequences of learning about other people's goal progress are likely to be diverse and complex, and have the potential to help or hinder a person in their own goal pursuit (Fishbach & Tu, 2016; Fitzsimons & Finkel, 2010); however, these consequences are poorly understood and, despite the frequency and range of ways with which people learn about others progress, insights from experimental work 'in the lab' have rarely been examined in the field. The present research therefore sought to explore a number of potential consequences of observing other people strive towards a goal in a real-world field context – an 11-week group weight-loss programme. Our specific interest was whether observing others make progress (i) leads people to feel that they have made progress themselves (an effect that has been termed 'vicarious goal satiation', McCulloch, Fitzsimons, Chua, & Albarracin, 2011) and (ii) influences people's own efforts and outcomes.

Observing Others Make Progress

Past theory and research suggests that good progress (i.e., progress that is faster than expected or required) can lead people to reduce effort (Carver & Scheier, 1982; Louro, Pieters, & Zeelenberg, 2007), although this may depend on the current state of goal progress (Louro et al., 2007; Reynolds, Webb, Benn, Chang, & Sheeran, 2018). For example, research on 'coasting'

suggests that people will reduce effort towards a focal goal when they feel that they have made progress (Louro et al., 2007; Fulford, Johnson, Llabre, & Carver, 2010). Similarly, evidence suggests that, goal-related information tends to be less accessible in memory after completing a goal (Marsh, Hicks, & Bink, 1998, see Johnson, Chang & Lord, 2006, for a review). The present research explores the idea that learning about other people's goal progress may also influence subsequent striving. Specifically, McCulloch et al. (2011) suggested that people vicariously, and unwittingly, experience this same post-goal or post-progress reduction in effort simply by observing another person complete a goal.

McCulloch et al. (2011) conducted two laboratory experiments to investigate vicarious goal satiation. In the first experiment, participants either viewed someone completing a set of anagrams, viewed someone not completing the anagrams, or watched nothing. Participants who observed someone completing the anagrams subsequently performed worse than participants in the other two groups on a comparable task. A second experiment showed that goal-related words were less accessible when participants had read about someone who had successfully completed a goal (here, finding their manager) than when they had observed someone who was equally committed to completing the goal, but did not achieve it. McCulloch et al. concluded that these effects occurred because the participants vicariously experienced the observed party's progress (i.e., inferred that they had made progress themselves and so downregulated effort).

Based on these findings, we wondered how information about others' pursuit of similar goals might affect everyday goal pursuit. For example, how does learning that a colleague striving for tenure has published another paper or witnessing a running buddy set a good time in a race, affect people's own striving toward similar goals? Given the limitations of the existing work, which has relied on experimental tasks conducted in the lab, with relatively artificial and

hypothetical tasks, as well as short follow-up periods, we wondered if real-life goal pursuit would also be affected by observing others' progress. Thus, to explore these questions, we used a longitudinal design in a field context that afforded us the opportunity to measure significant and meaningful goal outcomes.

We also set out to understand why and how others' progress can influence goal pursuit. Although the feeling that one has also made progress is theorised to be the key mechanism underlying the detrimental effects of observing others make progress (McCulloch et al., 2011), no work to date has measured perceived progress in the wake of observing others' progress toward a similar goal. Furthermore, other mechanisms could also explain the impact of observing others make progress. For example, seeing someone else do well may be motivating, either explicitly (e.g., "I really want to do that well!") or implicitly, as evidence suggests that people can unconsciously 'catch' others goals or motivation (cf. work on goal or motivational contagion; Aarts, Gollwitzer, & Hassin, 2004; Radel, Fournier, de Bressy, & d'Arripe-Longueville, 2015). Finally, observing others making progress may influence people's beliefs about their ability (i.e., self-efficacy, Bandura, 1986) – either for the better (e.g., "If they can do it, then so can I!") or for the worse (e.g., "I must find this more difficult than other people"), which can then affect subsequent goal striving (Bandura & Jourden, 1991). Given that the proposed mechanism underlying the effect of observing others making progress has yet to be tested and that there are alternative potential mechanisms, it is critical to examine whether, how, and why observing others make progress can influence self-regulation.

The Present Research

The present research investigated the self-regulatory consequences of observing other people make progress toward a goal that they are also pursuing (namely, to lose weight) over an

11-week period. The research also provides the first test of the putative mediator of the effects of observing others' progress – namely, the experience of post-completion goal satiation as a result of inferring that one has also made progress. Other potential mechanisms were also tested, including shifts in motivation to pursue the focal goal, emotions associated with the goal, perceived task difficulty, and self-efficacy. We predicted that observing others make good progress toward their goals might be counterproductive for the individual in the sense that they come to (i) feel that they have made progress themselves, and (ii) have poorer self-regulatory outcomes (i.e., lose less weight or even gain weight) as a result.

Method

The programme

We recruited participants who were attending a Tier 2 weight management programme in the UK. Tier 2 services are typically multi-component weight management services (i.e., services that address both exercise and diet) that admit people with a BMI of 25 or higher (Department of Health, 2013). The programme consisted of 12 different groups, divided among four different leisure centres in the north of England and lasted 11 weeks, with one session each week, and an average of 12 people in each group. In each session, people were weighed by the group leader at the front of the class while the others were in the room. Participants were therefore exposed to information about others' progress through viewing the other person being weighed and also potentially through subsequent conversation, as they discussed their progress with each other informally and as part of group tasks. The sessions also included information on topics related to weight loss (e.g., portion size; internal and external triggers to eating; physical activity), which was followed by a group discussion, and a chance for one-to-one feedback on their progress. In

addition, participants were asked keep a food diary and were also given a free gym membership that lasted the length of the programme.

Participants

The number of participants that were recruited was primarily determined by practical considerations (i.e., the number of people in the weight loss programme and the number of sessions that we could visit to collect data). However, Maas and Hox (2005) recommend that at least 50 level-2 units are recruited to avoid biased standard error estimates in multilevel modelling. As participants represented a level 2 variable in our multilevel analyses (with our level 1 variables being within-participant, measured at each of the 11 weeks), we aimed to recruit a minimum of 50 participants. Recruitment took place during the welcome week of the programme. Of the 208 people who attended the first session, 158 were invited to participate. A total of $N = 132$ people (84%) agreed to participate in the research and completed, on average, a questionnaire in 5 out of the possible 11 sessions. Due to exclusions, the final number of participants included in the analysis was 121 (see Approach to analysis).

The mean age of the sample was 47.63 years ($SD = 15.47$) and the majority of the participants were female (75.7%; 1.6% did not disclose their gender). The mean Body Mass Index (BMI) of the sample was 33.91 ($SD = 5.62$; range = 26.53 to 55.33) and the mean waist circumference was 109.68cm ($SD = 13.52$cm; range = 84.50 to 152.00); both of which were measured during the welcome week by the group leaders.

Measures

The primary outcome variable was changes in weight, reflecting the outcome of self-regulatory efforts. At the start of each session, the group leader asked participants to step on a set of weighing scales and their weight was recorded in a logbook. Weight at week *n* was subtracted

from weight at week $n + 1$ to create a variable representing changes in weight each week. Positive values therefore indicate weight gain and negative values indicate weight loss.

A questionnaire was administered at the end of every session in the programme and thus each of the following variables were measured every week (the full questionnaire can be found in the Supplementary Materials). The key predictor variable in the analyses was the *perceived progress of others*, which was assessed with two items at each time point: "On average, the people in my group seem to have made good progress towards their goal of losing weight over the past week" and "The people in my group seem to have lost weight over the past week". Participants were asked to respond to each item on a 5-point scale and responses were combined into a single index at each time point (median $\alpha = .85$).

In addition, the questionnaire measured a number of potential mediators of the association between observing others make progress and the primary outcome (i.e., changes in weight). *Perceptions of own goal progress* was assessed with three items: "I am currently not losing as much weight as I would like", "In your opinion, how close are you to attaining your weight-loss goal?", and "I am making good progress towards my weight loss target" (median $\alpha = .73$). *Intentions to lose weight* was also assessed with three items: "I intend to lose weight over the next week", "I will try hard to lose weight over the next week", and "I really want to lose weight over the next week" (median $\alpha = .88$). These items were all measured on 5-point response scales in which higher scores indicate better perceived goal progress and stronger intentions to lose weight.[1] A modified version of the Russell Affect Grid (Russell, Weiss, & Mendelsohn,

[1] Intentions to lose weight were heavily skewed, with the majority of participants reporting strong or very strong intentions to lose weight. This was not surprising as all of the participants were attending a group with the aim of losing weight. Intentions were therefore dichotomised before use in analysis such that scores of 1 to 4 were taken as indicating relatively weak intentions and a score of 5 was taken as indicating strong intentions to lose weight. Sensitivity

1989) was used to assess how participants felt about trying to lose weight. Following instructions on how to use the grid, participants were asked to "place an X on the grid to show how you feel when you think about trying to lose weight". This measure provided two variables: *goal-related valence* and *goal-related arousal*. Higher scores indicate greater arousal and positive emotional valence. Two further variables – *self-efficacy* (two items; median $\alpha = .33$) and the *perceived difficulty of losing weight* (two items; median $\alpha = .36$) – are not presented in the manuscript due to poor internal consistency; however, several analyses were conducted and are reported in the Supplementary Materials.[2]

Approach to analysis

The data were analysed using repeated measures Multilevel Linear Models in accordance with the procedures described by Heck, Thomas, and Tabata (2014) and Field (2013). Separate models were estimated for each of the five outcomes: (i) changes in weight, (ii) participants' feelings about their own progress, (iii) intentions to lose weight, (iv) goal-related valence, and (v) goal-related arousal. Measurement occasions (level 1) were nested within participants (level 2). Weight loss group was used as a covariate rather than a level 3 variable as the participants were not perfectly nested within groups (i.e., a small percentage of participants switched groups). The covariance structure was set as Heterogeneous First-order Autoregressive (ARH1) for all models except the model with intentions as the outcome. This model would not converge with an

analyses (reported in the Supplementary Materials) suggest that this decision did not substantively change the results.

[2] The baseline questionnaire included a measure of dietary restraint (the Dutch Eating Behaviour Questionnaire, DEBQ; van Strien, Frijters, Bergers, & Defares, 1986) and the second questionnaire measured the extent to which participants believed that they were similar to others in the group using the Inclusion of Other in the Self (IOS) task (Aron, Aron, & Smollan, 1992). However, these variables were not central to the hypotheses examined here and so are not reported further.

ARH1 structure, and therefore was set as First-order Autoregressive (AR1). The variable 'time', which represents the week in which data was collected, was also included a covariate. Outliers (defined as values > 3 *SD*s from the sample mean) were removed from analyses and predictor variables were group-mean centered. The intercept was set as a random effect for all models.

While checking the data, it was discovered that the number of unique participant codes (174) exceeded the number of consent forms (132), indicating that some participants misreported their participant codes on at least one occasion. If all of these data had been included, this would have meant that a single participant could have been represented in the analysis as two different participants, thus violating the assumption of independence. Therefore, participant codes that were associated with only one time point were not included in the analysis (53 observations out of 941) resulting in 121 participants (and 888 observations) that were included in the final analyses. To ensure that these decisions did not substantively affect the results, we ran sensitivity analyses, which are reported in the Supplementary Materials.

The variables in the mediation analysis were represented as level 1 variables, meaning a 1-1-1 model, which were calculated using an online tool (Selig & Preacher, 2008). As the slopes for *a* and *b* were not random, a standard Monte Carlo method for estimating indirect effects was used (Preacher & Selig, 2010; Selig & Preacher, 2008). All other analyses were conducted using SPSS v25.

Results

Participants lost an average of 0.47kg (*SD* = 0.92) each week over the course of the 11-week programme. This change in weight was significant, with a multilevel model showing that weight decreased on average each week, *B* = -0.43 (95% CI [-.50, -.36]), $p < .001$, while controlling for group. Figure 1 shows the average change in weight per week (see the

Supplementary Materials for further figures showing changes in the other four outcomes over time).

Does observing others' progress affect weight loss?

Multilevel models were used to test the self-regulatory outcomes of exposure to other people's goal progress while controlling for time (i.e., session number) and group. Perceiving that other people were making (good) progress toward their weight loss goals was associated with losing a smaller amount of weight over the following week, $B = 0.13$ (95% CI [.04, .22]), $p = .005$. For the full model, see Table 1.

What mediates the association between perceptions of others' progress and changes in the participant's weight?

Four variables were investigated as potential mediators of the association between observing others making progress and subsequent changes in weight: (i) Perceptions of own goal progress, (ii) intentions to lose weight, (iii) goal-related valence, and (iv) goal-related arousal. Perceiving that other people were making (good) progress toward their weight loss goals was associated with the feeling that own goal progress was going well, $B = 0.22$ (95% CI [.14, .29]), $p < .001$, positive goal-related affect, $B = 0.27$ (95% CI [.05, .49]), $p = .017$, and stronger intentions to lose weight over the next week, $B = 0.04$ (95% CI [.01, .07]), $p = .012$. There was no relationship between others' goal progress and goal-related emotional arousal, $B = 0.06$ (95% CI [-.10, .22]), $p = .464$. For full models, see Table 2.

Participants' feelings about their own goal progress mediated the (detrimental) association between observing others make progress and changes in (their own) weight, $B = 0.02$, 95% CI [0.00, 0.04] (see Figure 2). This suggests that observing other people make good progress led participants to feel that they were nearer to the goal themselves (i.e., vicarious goal

satiation), which was associated with losing a smaller amount of weight over the following week. This indirect effect was, however, small, and there still was a significant direct effect of others' progress on weight change after accounting for the observers' perceptions of their own progress. There was no evidence that intentions to lose weight, $B = 0.00$, 95% CI [-0.02, 0.01], goal-related valence, $B = 0.01$, 95% CI [-0.00, 0.02], or goal-related arousal, $B = 0.00$, 95% CI [-0.01, 0.00] mediated the association between observing others make progress and changes in weight.

Sensitivity analyses

None of the results substantively changed after running the analyses (i) treating the measure of intentions to lose weight as continuous, rather than dichotomous, (ii) including participant data associated with only one week, (iii) including outliers (> 3 *SD*s from the mean), and (iv) controlling for the age and gender of participants in the models. These analyses are reported in the Supplementary Materials.

Discussion

The aim of the present research was to investigate the self-regulatory consequences of observing others making progress toward their goals. A longitudinal study of participants enrolled in a group weight loss programme provided evidence that observing others' make progress toward their goals can undermine people's own weight loss efforts, because it can lead them to feel that they have also made progress toward their own weight loss goals. This finding extends prior laboratory demonstrations of the effects of vicarious goal satiation (e.g., McCulloch et al., 2011; Tobin et al., 2015) and demonstrates – for the first time – that changes in people's feelings about their own progress are (at least partly) responsible for the detrimental effects of observing others making progress on self-regulatory outcomes.

It was notable that the association between observing others' progress and changes in weight was only partially mediated by changes in the observer's perceptions of their own goal progress, suggesting that vicarious goal satiation is only part of the explanation. Further research is therefore needed to identify additional mechanisms by which observing others making progress can effect self-regulation. Three further mechanisms were tested in the current study: intentions (to lose weight), goal-related affect, and goal-related arousal. There was no relation between others' goal progress and how aroused participants felt themselves when thinking about the goal, ruling this out as a mechanism. Participants did report feeling more positive about losing weight and reported stronger intentions to lose weight after seeing others' make progress, however neither of these two variables explained why observing others make progress was associated with losing a smaller amount of weight. Indeed, it might be expected that stronger intentions to lose weight (as a function of observing others make progress) may lead people to be more successful in losing weight; however, the mediation analysis did not show an indirect effect of observing others' progress, via intentions, on changes in weight. It is possible that the participants did not act on their intentions; as the gap between intentions and behavior is well documented (Sheeran, 2002; Sheeran & Webb, 2016; Webb & Sheeran, 2006). Alternatively, our other analyses suggested that participants who observed others making progress came to believe that they were also making progress themselves. Therefore, despite stronger intentions, they may not have identified a discrepancy between their current progress and desired progress that needed action.

From a practical perspective, the present findings have potentially worrying implications for the organisers of weight loss groups as well as weight loss apps delivered via smart devices such as phones and computers, many of which seem to prioritize the sharing of progress with other

members. Such initiatives assume that pursuing a goal alongside others doing the same is likely to be beneficial in the sense that the people provide mutual support to each other (Leahey, Kumar, Weinberg, & Wing, 2012; Wing & Jeffery, 1999) or motivate each other (Radel et al., 2015; Scarapicchia, Sabiston, Anderson, & Bengoechea, 2013). However, if observing others make progress has the potential to undermine self-regulation, then this strategy may actually be counterproductive.[3] Such programmes may therefore want to consider finding ways to assess progress in ways that are not shared with others. It should be noted that the current study investigated the effects of exposure to people making *progress* rather than completely achieving their goal. Given that the current findings were consistent with the reported effects of seeing or reading about others complete a goal (e.g., McCulloch et al., 2011; Tobin et al., 2015), it seems that vicarious effects are not limited to seeing someone complete a goal, but also include seeing someone make progress. Furthermore, given that many important goals – e.g., losing weight, being a good parent, performing well at work – tend to involve repeated striving over long periods of time and are never really 'completed', the present findings are both striking and concerning.

Limitations and future directions

One limitation of the present research is that the relationship between perceptions of others' progress was not manipulated and so the design is essentially correlational. While this prohibits any causal interpretation of the association between others' progress and outcomes, our

[3] We acknowledge, however, that other aspects of weight loss programmes may outweigh or counteract the negative effects of being exposed to others' progress and indeed, on average, participants in the programme studied here did succeed in losing weight, suggesting that the programme as a whole was effective. Future research might randomly allocate participants to classes that either share weight loss progress or do not to separate the effects of hearing about others' progress from other aspects of weight loss programmes.

hypotheses are based on experimental research in the laboratory that does manipulate progress and the longitudinal design does allow certain conclusions to be drawn about the nature of the relationship between others progress and changes in weight. Specifically, exposure to others' weight (and the measure of others' apparent progress) preceded the measure of changes in weight by a week, which is consistent with the idea that observing others make progress influenced the person's own self-regulatory efforts (see Hill's criteria; e.g., Höfler, 2005). In the future, experimental field studies that randomly allocate participants to classes that either share weight loss progress or do not and then monitor changes in weight over time would help to determine causality and also help separate the effects of hearing about others' progress from other aspects of weight loss programmes. Such studies would also help to determine if concealing the progress of others has a clinically meaningful impact on people's weight.

Conclusion

The current study showed that observing other people making progress toward a goal (in this case, trying to lose weight) was associated with the observer feeling that they had made progress themselves and, as a consequence, the observer lost a smaller amount of weight over the following week. These findings provide the first evidence of such processes in the field and the first evidence of one mechanism underlying this effect (namely, changes in participants' perceptions of their own progress). The findings have implications both for our understanding of self-regulation and for the design of group weight loss programmes and other contexts in which people strive for their goals alongside others.

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Table 1.

Multilevel model predicting weight change over the following week from perceptions of others' progress, time, and group

	Change in weight	
	B (SE)	*p*
Fixed effects		
Intercept	-.43 (.13)	.002
Time (week number)	.02 (.01)	.057
Group		
1	.02 (.19)	.925
2	-.25 (.28)	.361
3	-.17 (.17)	.311
4	-.37 (.18)	.045
5	-.27 (.20)	.168
6	.27 (.21)	.207
7	.19 (.23)	.425
8	.17 (.19)	.374
9	-.36 (.19)	.057
10	-.07 (.19)	.727
11	-.18 (.19)	.338
12	-	-
Others' progress	.13 (.05)	.005
Random effects		
Intercept	.10 (.03)	< .001

Table 2.

Multilevel models predicting the four putative mediators from perceptions of others' progress, time, and group

	Participant's feelings about their own progress		Intentions to lose weight		Goal-related valence		Goal-related arousal	
	B (SE)	*p*	*B* (SE)	*p*	*B* (SE)	*p*	*B* (SE)	*p*
Fixed effects								
Intercept	-.20 (.16)	.217	1.04 (.07)	< .001	-.00 (.40)	.994	-.06 (.33)	.862
Time (week number)	.03 (.01)	.002	-.02 (.00)	.001	.00 (.03)	.956	-.00 (.02)	.906
Group								
1	-.25 (.23)	.275	-.20 (.10)	.045	-.59 (.57)	.303	.49 (.48)	.305
2	-.15 (.29)	.595	-.17 (.14)	.213	-.54 (.76)	.473	.18 (.61)	.767
3	-.11 (.22)	.621	-.10 (.09)	.275	-.11 (.53)	.840	.19 (.44)	.661
4	.51 (.24)	.037	-.09 (.10)	.350	.55 (.58)	.347	-.87 (.48)	.072
5	-.07 (.21)	.747	-.09 (.09)	.336	-.69 (.55)	.215	-.12 (.44)	.779
6	.15 (.21)	.557	-.07 (.12)	.574	.38 (.67)	.576	-.69 (.56)	.375
7	.25 (.28)	.363	-.60 (.13)	< .001	1.05 (.74)	.156	.69 (.62)	.264

8	.32 (.21)	.128	-.22 (.09)	.020	1.25 (.55)	.026	.78 (.44)	.076
9	.33 (.25)	.190	-.07 (.12)	.551	-.03 (.61)	.967	.03 (.54)	.950
10	.25 (.21)	.223	-.26 (.10)	.008	.18 (.53)	.740	-.38 (.44)	.384
11	-.03 (.22)	.885	-.32 (.10)	.002	-.36 (.56)	.524	.08 (.47)	.869
12	-	-			-	-	-	-
Others' progress	.22 (.04)	< .001	.04 (.02)	.012	.27 (.11)	.017	.06 (.08)	.464
Random effects								
Intercept	.46 (.07)	< .001	.08 (.01)	< .001	1.87 (.41)	< .001	1.70 (.30)	< .001

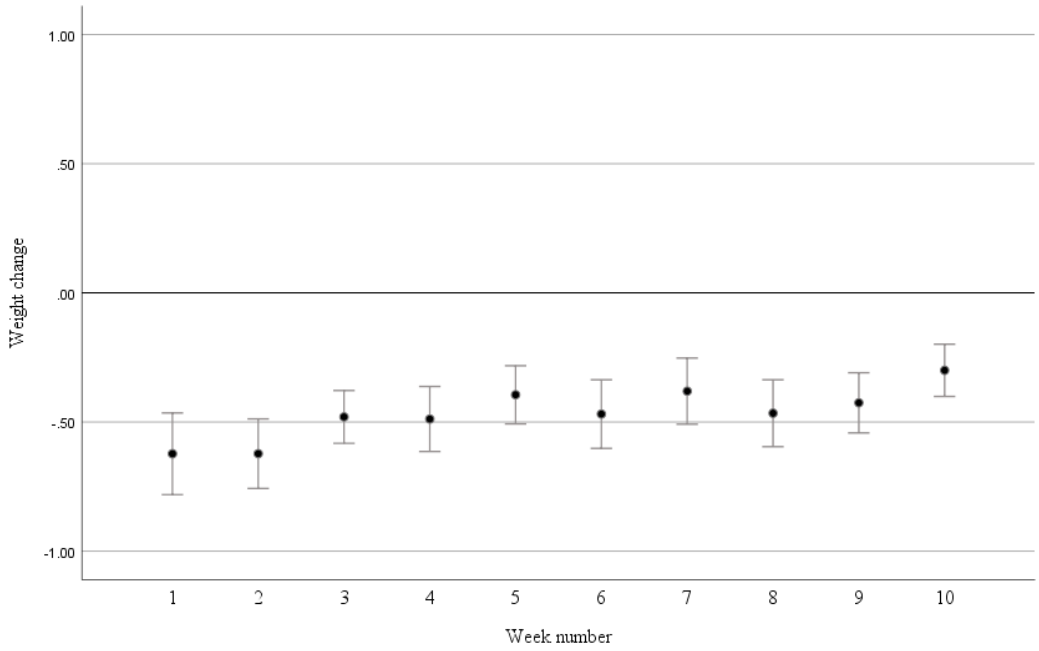

Figure 1.

Mean weight change over a one week period, for every week of the programme. Error bars represent standard errors. Negative values indicate that, on average, the participants lost weight over the week, whereas positive values would indicate that, on average, the participants gained weight over the week.

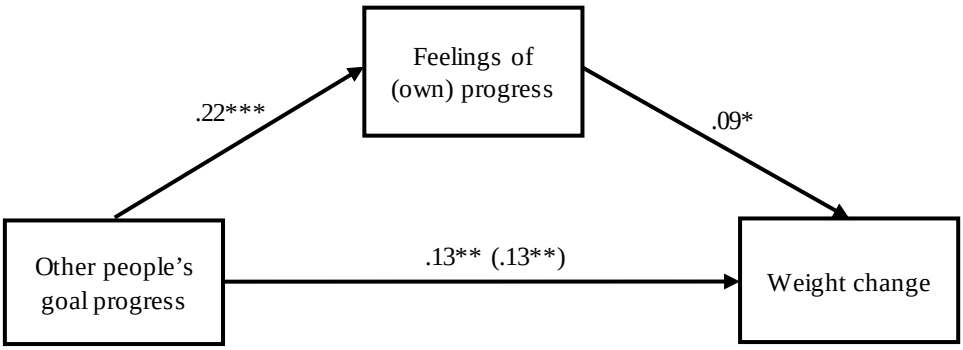

Figure 2.

A mediation model showing how feelings of progress mediate the association between perceptions of other people's goal progress and self-regulatory outcomes. * $p < .05$, ** $p < .01$, *** $p < .001$. Indirect effect: $B = .02$, 95% CI [.00, .04]