The Snowball Effect of Diet Failure and the Role of Causal Attribution Style and Emotional Response

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Abstract

The present study was designed to introduce a new perspective on the snowball effect of failure within the context of dieting by combining insights from the disinhibition effect studies and the abstinence violation effect studies. Two possible determinants of the snowball effect of diet failure, causal locus (a dimension of causal attribution) of a diet violation and emotional response to the violation, were tested. It was expected that internal attributions as opposed to external attributions would lead to more subsequent diet violations. Furthermore, it was hypothesized that emotional response mediates this effect. The participant group existed of 217 women from the UK, between the age of 18 and 40, who had a diet goal. Participants' causal attribution of their most recent diet violation and emotional response to this violation were obtained. 4 days later, participants reported their subsequent diet violations of the past days. Subsequent diet violations were measured in three ways: failure days, failure frequency and subjective failure. The results did not support the hypotheses. This was possibly due to the lack of variance in the causal attribution of participants. It was noticeable that the large majority of the participants attributed their violations internally and that almost all of them violated their diet frequently within the second part of the study. This shows the importance of conducting further research into the determinant of the snowball effect diet failure.

Keywords: dieting behaviour; diet failure; goal violation; disinhibition effect; abstinence violation effect; causal attribution; emotional response

The Snowball Effect of Diet Failure and the Role of Causal Attribution Style and Emotional Response

Imagine that one afternoon a group of friends is hanging out. One of the friends offers the rest of the group a slice of homemade chocolate cake. Two of the friends, Katie and Lisa, are both on a diet, trying to stay away from unhealthy food in order to lose 5 kilograms of weight. However, the chocolate cake looks delicious and both of them feel the temptation to eat a slice. Like for every other goal, pursuing your dieting goal requires self-control. Especially, in situations where short-term goals, in this case eating the chocolate cake, conflicts with one's long-term dieting goal (Gillebaart, Schneider, & De Ridder, 2016). Because self-control is not an infinite resource, it is inevitable that sometimes people are not able to exert enough self-control to regulate themselves (Muraven & Baumeister, 2000). As a consequence, they give in to the temptation of a short-term goal. In this moment, both Lisa and Katie are low on self-control and consequently give into the temptation of the chocolate cake. Now looking at this situation, this single violation of their dieting goal is objectively seen as insignificant and harmless to their overall weight. But now imagine that later that afternoon their friend puts out some other snacks for them to eat. Lisa is able to refrain herself from eating anything else that is not in line with her diet. Katie on the other hand, feels like she already violated her diet and continues so by eating more snacks. In her case, it seems like the first diet violation sets in motion a snowball effect of subsequent diet violations. The earlier diet goal violation clearly had different consequences for Lisa and Katie. The fact that both of them are in the exact same physical situation shows that this difference results from personal internal differences.

The described scenario above raises the critical question of what internal determinants set in motion this snowball effect of diet failure. When turning for answers to the self-regulation literature, it becomes clear that research in this field has generally overlooked this

question. Most studies seem to be focused on prevention of failure and hardly any research is conducted on the aftermath of failure (Wagner & Heatherton, 2015). Keeping the fact that goal violations are not completely inevitable and that one violation can affect subsequent failure in mind, it would be valuable to investigate the repercussions of a diet goal violation in terms of subsequent failure.

Therefore, the aim of this study is to shed new light on this snowball effect of subsequent failure and possible determinants in the domain of dieting behaviour. This is done by exploring the insights on the aftermath of failure of two different lines of research, the addiction literature and the dieting literature, and applying the insights in this new context. First, the aftermath of failure will be discussed in light of the dieting literature, where it is often described in terms of the disinhibition effect (Herman & Mack, 1975; Mills & Palandra, 2008). Following, insights from the addiction literature on the consequences of failure will be discussed and the insights of both lines of research will be compared and integrated (Collins & Witkiewitz, 2013). Accordingly, it will become clear how combining the two lines of research leads to the hypothesis that causal attribution and emotional response contribute to the rise of the snowball effect of diet failure[1].

First of all, as mentioned before, the described phenomenon above is in the dieting literature often referred to as the disinhibition effect. The disinhibition effect entails that one violation can have a detrimental effect on subsequent goal performance, whereby one goal violation is likely to result in more violations. Herman and Mack (1975) were the first researchers to demonstrate the existence of this effect in restrained eaters (i.e., chronic dieters)

[1] It should be noted that there are different dimensions of causal attributions. However, the focus of the current study lays just on one dimension, which in the literature is often called causal locus (Stiensmeier-Pelster & Heckhausen, 2018). Therefore, in the current study the term causal attribution is used to refer to this specific dimension of causal attribution.

with a clever experiment. In their experiment, they manipulated restrained eaters into violating their own diet. At the beginning of the study, restrained eaters and unrestrained eaters were asked to drink a high-calorie 'preload' milkshake. After this preload, the participants took part in an ice cream tasting where they were allowed to taste as much ice cream as they liked. Restrained eaters ate even more ice cream than unrestrained eaters after they already violated their diet by drinking the milkshake. The study showed that the belief that one has violated one's diet sets in motion a snowball effect of subsequent violations. Many studies were conducted to replicate the classic Herman and Mack's (1975) experiment to find this effect. The results are mixed, some studies did successfully find the disinhibition effect (Mills & Palandra, 2008; Ruderman & Christensen, 1983), but others failed to find this effect (Tomiyama, Moskovich, Haltom, Ju, & Mann, 2009; Van Strien, Cleven, & Schippers, 2000). The mixed results suggest that there are moderating factors that can reinforce this snowball effect of subsequent violations. However, these studies fail to find or do not focus on finding the possible determinants that can either enhance or inhibit this effect.

Second, when looking at the addiction literature, a similar effect is often described within the context of the relapse process. Within this literature, this effect is called the rule violation effect (Curtin, Stephens, & Roffman, 1997; Soman & Cheema, 2004) or *abstinence violation effect* (*AVE*; Curry, Marlatt, & Gordon, 1987) and is used to describe the consequences of violating one's goal to stay abstinence from an addictive substance; an addict who experiences a lapse after a period of being abstinence from for instance alcohol, is at risk to subsequently lapse again (Collins & Witkiewitz, 2013). Determinants that can strengthen the effect have been investigated within this line of research. The AVE seems to be the product of cognitive and affective determinants: the causal attribution of the violation of one's goal and the emotional response to the violation (Larimer, Palmer, & Marlatt, 1999). What a person perceives as the cause of his or her violation, determines the intensity of the AVE and

contributes to the subsequent goal performance. Depending on the type of causal attribution, an emotional response can be elected which in turn affects the subsequent goal performance.

In fact, Marlatt and Gordon (1985) suggest that the intensity of the AVE increases when the causal attribution of the violation is more internal. When the violation is attributed to internal as opposed to external factors, a person sees his or her own personal characteristics as the reason for the violation. This increases the chances of spilling over to affect subsequent behaviour. For example, after eating the piece of chocolate cake, Katie may conclude that is was caused by her inability to exert self-control, which may affect future attempts to exert self-control. In general, internal attribution leads to negative emotions and feelings of guilt or anger. In turn, negative emotions heighten the change of subsequent goal failures (Curry et al., 1987; Wagner & Heatherton, 2015).

Instead of attributing the cause of the violation to internal factors, a violation can be attributed to external factors. In this case, a person acknowledges that the behaviour was caused by the unique circumstances of the situation and therefore the violation is not perceived as a threat to subsequent goal performance (Collins & Witkiewitz, 2013). For instance, when Lisa's friend made the chocolate cake especially for her and her friends, she may conclude that succumbing to the temptation is related to the specific circumstances of the situation rather than an inherent lack of self-control. Because in this case she does not see herself as the cause of the violation, the intensity of the AVE is diminished and the negative affect is resolved. (Baumgardner & Arkin, 1988; Collins & Witkiewitsz, 2013). Therefore, the impact of the violation on future goal attainment is reduced.

The effect of causal attribution and the AVE on relapses and subsequent goal performance has extensively been tested in the area of substance use, including alcohol consumption (Collins & Lapp, 1991), smoking (Curry et al., 1987; O'connell, & Martin, 1987) and smoking marijuana (Stephens, Curtin, Simpson, & Roffman, 1994). A few studies

were conducted to examine the AVE for diet goals of clinical groups of morbidly obese patients. However, this research did not focus on the direct effect of causal attribution on subsequent diet violations (Carels, Douglass, Cacciapaglia, & O'brien, 2004; Mooney, Burling, Hartman, & Brenner-Liss, 1992) In addition, the participants of both studies were people from a specific clinical group and therefore do not represent the general public.

Taken together, till now there has been a lack of research done to investigate the consequences of failure, as research has mainly focussed on prevention of failure (Wagner & Heatherton, 2015). As goal violations are not completely avoidable because people only have a limited amount of self-control, it could be more valuable to focus research on the consequences of failure rather than the prevention of failure. Considering the fact that one violation can lead to subsequent violations, it is worthwhile to investigate what determinants can inhibit or enhance this effect. When looking at the literature on the aftermath of failure we see that the conducted research is limited to two specific contexts: the dieting behaviour of highly restrained eaters and morbidly obese patients, as well as the relapse process of addicts. As goal violations and failure are problems that everyone struggles with and not just these specific groups, the present study will make a first attempt to translate insights from these lines of research to the context of dieting behaviour of the general public in order to shed new light on self-regulation failure in dieting behaviour. Gaining insight into the way how coping with our missteps exactly affect our dieting goal pursuing, would be fundamental in understanding why we often fail to achieve our dieting goals. As a result, insights that are obtained from this study can be used to develop interventions to prevent a snowball effect of subsequent violations from happening.

Therefore, the aim of this study is to make the first steps into understanding how coping with failure can have a detrimental impact on subsequent diet pursuit. This is done by applying insights on the AVE and disinhibition effect on more everyday diet goal pursuit. To

be more specific, the current study is conducted to investigate if the causal attribution of an initial goal violation and the emotional response to this goal violation have an effect on subsequent diet violations. It is hypothesized that causal attribution has a main effect on subsequent goal violations. That is, dieters that internally attribute their goal violation are likely to subsequently violate their goal more often, in comparison to dieters that externally attribute their goal violation. Furthermore, it is hypothesized that emotional response has a mediating effect on the relationship between causal attribution and subsequent goal violations. It is expected that more negative emotions are induced by internal attribution, than external attribution, and that these negative emotions in turn contribute to the subsequent violations.

Method

Design and Participants

The current study has a retrospective cross-sectional design, with three measures of subsequent failure as dependent variables. Participants were asked to report their causal attribution of their most recent diet goal violation and the emotional response to this violation, which served as the independent variable and mediating variable, respectively. Because dietary restraint has been found to be an important moderator of the disinhibition effect, the score on the Restraint Scale (RS) was included as a control variable in the present study (Herman & Mack, 1975; Mills & Palandra, 2008).

The participants were approached through Prolific, a website where participants can fill out surveys for a monetary compensation. Based on the participants' answers on the Prolific screening questionnaire, only participants that fitted the following eligibility criteria were invited to participate in this study: female, living in the UK, native English speakers, between the age of 18 and 40, pursuing a dieting goal. These criteria were chosen to assure a participant group that is comparable to participant samples of previous studies on diet behaviour. Because the current study investigates the influence of goal violations on

subsequent goal pursuit, it is important that participants had a diet goal. To assess participants' diet goal, the following question was added to the Prolific screening questionnaire 'Do you currently for at least one week restrict your food intake in any way, with the goal to manage your weight? If yes, what is your goal?'. The eligible answer options were: Yes, to lose weight' and 'Yes, to maintain my current weight'. If participants choose to answer 'Yes, to gain weight' or 'No, I do not currently for at least one week restrict my food intake to manage my weight', they were excluded from participating in this study.

In total 299 participants were invited to participate in this study. Later, 67 participants were excluded from the study because they did not restrict their food intake in order to lose weight or maintain their current weight or did not violate their diet in the 4 days before participating in this study. One participant was excluded from the study because of problems with the shifted data. 10 participants dropped out during the second part of the study. The final sample consisted of 221 participants. They had a mean age of 31 year (*SD* = 5.52) and a mean BMI of 28.03 (*SD* = 7.26).

Procedure

The purpose of this study was to investigate the effect of dieters' reported causal attributions to their initial goal violation on subsequent diet violations. At the same time, the mediating role of emotional response on this effect was investigated. To measure this, the study consisted of two parts. In the first part, the independent variable and mediator involving participants' most recent goal violation were assessed. The three dependent variables, one subjective and two objective measures of subsequent goal violations were obtained in the second part of the study.

Part 1. For the first part of the study, participants that matched the eligibility criteria were approached to participate in a study about dieting. Participants first received some

information about the study. After they gave their consent for participating in the study, they could started filling out the *baseline questionnaires*, followed by the *goal violation questionnaire*. One of the questions of the goal violation questionnaire contained whether participants violated their diet in the past 4 days. Participants that did not recently violate their dieting goal could skip the remaining questions of the questionnaire. All other participants carried on filling out the questionnaire which included questions about participants' causal attribution and emotional response. The participants were informed that the first part of the study was now finished and that in 4 days they possibly would be invited to participate in the second part of the study. The importance of participating in both parts of the study was stressed. This part of the study took approximately 15 minutes and participants received a monetary compensation of £1.50.

Part 2. All participants who had previously indicated to have violated their diet received an invitation 4 days after their participation in the first half of the study. They had two days to fill out the second questionnaire. This questionnaire included questions about one's *subsequent goal violations* in the past 4 days. After filling out this questionnaire, the second part of the study was finished and participants were debriefed about the purpose of the study. This part of the study took approximately 5 minutes and participants received £3 for their participation.

Measurements

Part 1.

Baseline questionnaire. [2]

[2] The baseline questionnaire included the diet goal question from the screening questionnaire as an extra control question. A shortened version of the Attribution Style Questionnaire (ASQ; Dykema, Bergbower, Doctora, & Peterson, 1996) and a shortened version of the Preference for Consistency Scale (PFCS; Guadagno & Cialdini,

Demographics. The first part of this questionnaire contained demographic questions about age, gender, education, country, native language, weight (either in pounds or kilograms) and length (either in feet/inches or centimetres).

Diet questions. Participants were asked in which way they restricted their food intake and could choose from different options ('Restricting my caloric intake', 'minimizing the consumption of unhealthy foods', etc.). If participants had more than one goal, they were asked to choose their most important goal.

Restraint Scale. Participants also had to fill out the RS (Herman & Polivy, 1980). This questionnaire consisted of 10 questions that assess frequency of dieting, weight fluctuations and attitude towards own eating behaviour (e.g., 'How often are you dieting?'). All questions are answered on a 5-point scale (e.g., 'never - rarely - sometimes - usually – always'). The RS has generally been found to have satisfactory levels of internal consistency ($\alpha > .80$; Boyce, Gleaves, & Kuijer, 2015). In this particular study, the reliability was found to be lower yet still sufficient ($\alpha = .73$). A sum score of the answers on the RS was used as a control variable in the main analysis.

Goal violation questionnaire.[3]

2010) were also part of this questionnaire. However, variables that are measured with the ASQ and PFCS are beyond the scope of the current study. Therefore, these questionnaires will not be discussed in further detail.

[3] The following questions were also part of this questionnaire: 'During a typical week, on how many days do you eat something - a meal or a snack - that is not in line with your dieting goal?', 'During a typical week, how many times in total do you eat something - a meal or a snack - that is not in line with your dieting goal?', 'During a typical week, to what extent do you feel like you successfully follow your diet?' (answer scale ranging from ' 1 = not at all' to ' 7 = very much'). Furthermore, participants were asked, in comparison to before the goal violation, how much they felt motivated, in control, sad, confident and to what extent they had the intention to restrict their food intake. Participants were also asked, in comparison to before the goal violation, to what extent

Most recent goal violation. Participants were asked to indicate if they ate something in the past 4 days that was not in line with their diet goal. Furthermore, participants received questions about the situational and emotional context in which their most recent goal violation took place, what caused them to violate their diet, what kind of snack or meal they ate and to what degree this snack or meal violate their dieting goal. For this last question, answer options ranged from '1 = very small violation' to '7 = very large violation'. Participants also had to indicate 'today's date' and how many days ago the goal violation took place.

Causal attribution. Causal attribution was assessed with the following question: 'Now please try to classify the cause you just wrote down as something that has to do with yourself or something that has to do with other people or circumstances'. The answer options ranged on a scale from '1 = totally due to other people or circumstances' to '7 = totally due to myself'. A score < 4 indicated that a participant gave a more external than internal attribution, while a score > 4 was an indication of a more internal than external attribution.

Emotional response. Participants were asked to indicate, in comparison to before the goal violation, to what extent they experienced guilt, regret, shame, humiliation, helplessness, hopelessness, negative emotions, positive emotions, and hope after the violation. The questions were answered on a scale ranging from '1 = much less' to '7 = much more'. Because the first six emotions highly correlated with each other (all correlations were between .33 and .83, $p = 0.01$), a mean score was computed and used as a measure of emotional response ($\alpha = .89$).

Part 2.

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they felt like it was worthwhile to continue restricting their food intake for the rest of the day or from that moment on. Lastly, participants received questions that assessed if their attribution was specific or global, controllable or uncontrollable and stable or unstable. However, answers to these questions were beyond the scope of the current study.

***Subsequent goal violations questionnaire*[4]**. For every day of the past 4 days, participants first had to indicate the day and date of that the day that was referred to (today, yesterday, two days ago etc.). To help recall the right dates, a calendar was provided to them. Furthermore, for everyday of the past 4 days the participants were asked the following questions:

Failure days. 'On this day, did you eat something that was not in line with your dieting goal?'. The answer options were 'yes' and 'no'. Later the answers were recoded (yes = 1 and no = 0). A sum score of the 4 days indicated on how many days the participants' failed their diet and served as an objective measure of subsequent failure.

Failure frequency. 'How many times during this day did you eat something that was not in line with your dieting goal?'. A mean score of the 4 days was computed and served as the second objective measure of subsequent failure.

Subjective failure. 'To what extent do you feel like you successfully followed your diet during this day?'. The answer options of the last question ranged from '1 = not at all' to '7 = very much'. The answers were reversed and a mean score of the 4 days was computed.

Recall. Besides from the three questions that measured the dependent variables, the questionnaire also contained the following question 'To what extent do you feel like you were

[4] The following questions were also part of this questionnaire: 'To what extent do you feel like successfully followed your diet overall during these past four days?'. Answer options was ranged from '1 = not at all' to '7 = very much'. Furthermore: participants were asked to what extent they agreed with the following statements regarding their dieting behaviour: 'Once I eat something that is not in line with my dieting goal, I feel that I am more likely to do it again' and 'When I eat something that is not in line with my dieting goal, I feel there is no point in adhering to my diet for the rest of the day, so I abandon my dieting standards for that day'. Answer options ranged from '1 = strongly disagree' to ' 7 = strongly agree'. Answers to these questions were beyond the scope of the present study.

able to correctly recall your dieting behaviour during this day in order to answer the above questions?' The answer options ranged from '1 = not at all' to '7 = very much'.

Results

Descriptives and Intercorrelations

Participants on average scored 5.48 (*SD* = 1.66) on causal attribution, which indicates that most participants made internal rather than external attributions. Furthermore, participants on average scored 4.43 (*SD* = 1.38) on emotional response. Scores on the RS significant correlated with all three outcome variables. Almost the entire participants group (97.3%) violated their diet in the 4 days between the first and second phase. 95% of the participants had a score of > 4 (*M* = 6.01, *SD* = 1.00) on the recall questions indicating that participants were overall able to recall their diet violations. Excluding participants with a score < 4 did not yield meaningful changes in the results, so all participants were retained in the analysis. Mean scores, standard deviations and intercorrelations can be found in Table 1.

Table 1

Summary of Means, Standard Deviations and Intercorrelations of Age, BMI, RS, Days Ago, Degree of Violations, Causal Attribution, Emotional Response, Failure Days, Failure Frequency, Subjective Failure and Recall.

	1.	2.	3.	4.	5.	*6.*	7.	8.	9.	10.	11.
1. Age											
2. BMI	.21**										
3. RS	-.03	.40**									
4. Days Ago	.04	.10	-.08								
5. Degree of Violations	.80	.23**	.32**	.03							
6. Causal Attribution	.10	.05	.05	.03	-.09						
7. Emotional Response	.09	.26**	.40**	-.15*	-.39**	-.07					
8. Failure Days	-.13	.01	.17*	-.12	.06	-.02	.08				
9. Failure Frequency	-.12	.10	.22**	-.07	.04	> -.01	.07	.68**			
10. Subjective Failure	-.08	.04	.21*	-.15*	.06	-.03	.12	.70**	.72**		
11. Recall	.06	-.13	-.02	.07	.11	.17*	-.01	-.15*	-.17**	-.27**	
M	31.00	28.03	30.03	2.86	5.33	5.48	4.43	2.29	4.21	3.34	6.01
SD	5.52	7.26	4.80	1.11	1.52	1.66	1.38	.95	3.06	1.20	1.00

*$p < .05$, **$p < .01$.

Main Analysis

In the main analysis it was tested if there was an effect of causal attribution on the outcome variables, on top of the effect of dietary restraint. To test this, hierarchic linear regression analyses were performed with objective failure in days, objective failure in times and subjective failure as outcome variables. RS score was added as a control variable in step 1 of the analysis and causal attribution was added in step 2. Prior to performing hierarchical regression linear analyses, the relevant assumptions for this type of analysis were tested. The assumption of singularity, multicollinearity, and homoscedasticity have been met. Furthermore, an examination of the Mahalanobis distance showed no multivariate outliers.

Objective failure days. Step 1 of the analysis yielded a significant effect (R^2 = .03, F(1,219) = 6.47, p = .01), with RS score as significant predictor (β = .17, p = .01). Failure days increase as the RS score increases. Step 2 did not significantly contribute to the model (R^2 = .03, F(2,218) = 3.28, p = .04), meaning that causal attribution was not a significant predictor for objective failure in days.

Objective failure frequency. Step 1 of this analysis yielded a significant effect (R^2 = .05, F(1,219) =11.16, p = .00), with RS score as significant predictor (β = .22, p = .00). Failure frequency increases as the RS score increases. Step 2 did not significantly contribute to the model (R^2 = .05, F(2,218) = 5.58, p = .00), meaning that causal attribution was not a significant predictor for objective failure frequency.

Subjective failure. Step 1 of this analysis yielded a significant effect (R^2 = .04, F(1,219) = 9.75, p = .002), with RS score as significant predictor (β = .21, p = .00). Subjective failure score increases as the RS score increases. Step 2 did not significantly contribute to the model (R^2 = .04, F(2,218) = 5.05, p = .01), meaning that causal attribution was not a significant predictor for subjective failure.

When controlled for restraint score, there was no effect of causal attribution on the three outcome variables found. However, these analyses should be interpreted with caution as the results may be distorted by the lack of variance in causal attribution. That is, 71.5% of the participants had a score of > 4 on the causal attribution questionnaire, meaning that the large majority of the sample attributed their failure internally. Therefore, interpretations of these findings should be done with care.

Mediation Analysis

Potentially, due to the highly skewed distribution of causal attribution testing of the hypothesis that internal attribution leads to more subsequent diet failure than external attribution did not yield any significant findings. As a result, it was also not possible to investigate if emotional response has a mediating effect on this relationship. However, as it was hypothesized that in particular participants that attributed their violation internally would experience more negative emotions, and the large majority of the sample made internal attributions, the effect of emotional response on subsequent failure was investigated across the entire sample.

To examine this effect a Pearson correlation analysis was performed. This analysis yielded no significant correlations. The correlations between negative emotional response and subjective failure (r = -.12, p = .07), objective failure in days (r = .08, p = .26) and objective failure in total times (r = .07, p = .30) were not significant. This indicates that there is no significant coherence between negative emotional response and subsequent failure.

Discussion

The purpose of the present study was to make a first attempt into understanding the aftermath of failure and consequences on future goal pursuit. More specific, the current study was designed to examine the effect of causal attribution of a previous diet goal violation on

subsequent failure and how emotional response to the previous diet goal violation facilitates this effect. It was hypothesized that dieters who gave an internal attribution to their most recent diet goal violation would subsequently violate their diet more often, than dieters who gave an external attribution. Furthermore, it was expected that emotional response would mediate this effect. Specifically, it was expected that dieters who saw internal factors as the cause for their initial violation, would be more inclined to experience negative emotions as a response and as a consequence fail more often. The hypotheses were based on earlier studies that found the same determinants to play an important role in the relapse process, the AVE, in addicts (Curry et al., 1987; Larimer et al., 1999). The present study aimed to test if the same determinants enhance the snowball effect of diet failure in non-clinical groups.

The hypotheses of the current study were not supported by the results. An step-wise regression yielded no significant effect of causal attribution on subsequent diet failure. This was possibly due to the lack of variance in the causal attribution of the participants, which made it not possible to properly test this hypothesis. Therefore, it cannot be concluded if causal attribution has an effect on subsequent diet failure. Consequently, it could not be tested if emotional response mediated this relationship. As the large majority of the participants attributed their violation internally, it was possible to investigate the effect of emotional response across the entire participant sample. Nonetheless, emotional response did not significantly correlate with either subjective or objective subsequent failure.

Although the surprising finding that the large majority of participants made internal attributions for their diet goal violations limited our possibility to test the hypothesis, in itself this finding is noteworthy and warrants further discussion. Common reasons that participants gave for their goal violation were that participants were low on self-control because they felt tired, bored or experienced negative emotions, which are indeed internal attributions. This suggests that dieters are inclined to see themselves and their own lack of self-control as the

cause of their missteps. This finding contradicts the well-known phenomenon called the fundamental attribution error, in which people ignore situational factors and overemphasize internal factors in judging others' behaviour, while doing the opposite when judging their own behaviour (Jones & Nisbett, 1987; Ross & Nisbett, 2011). In addition, the findings contradict the theory behind the self-serving bias, which states that people have a tendency to attribute their positive achievements to internal causes, while attributing failures to external causes (Forsyth, 2008). From the point of view of the two described fallacies, it would be expected that the dieters would attribute their own failure to the situation rather than to themselves. However, the opposite was found to be true in this study.

A possible explanation for participants' tendency to internally attribute their failure, is that people are inclined to believe that they have conscious control over their own behaviour. This is even the case when people's behaviour is not consciously initiated by themselves. This idea is referred to as the illusion of conscious will and suggests that people have a natural tendency to internally attribute their behaviour (Wegner, 2004). At the same time, people do not take into account the influence of situational context on their own and others' behaviour (Bromme, 2000). As a result, participants may unwilfully violate their diet, but still see themselves as the cause of their own behaviour, while underestimating the influence of situational factors. This idea can also explains the fact that some participants that reported causes that were tied to their situational or social context, still attributed their diet violation to themselves. These participants named for example causes such as 'The major cause was not having food in the house when I was hungry, to cook something healthy' and 'I felt distracted by the situation I was in'. Even though these participants did recognize that their goal violation is linked to this specific situation, they still blamed themselves for it. This indeed implies a tendency to underestimate situational influences and an overestimation of internal influences, which may causes them to misattribute the cause to themselves.

In addition to the interesting findings on causal attribution, this study also yielded surprising findings on emotional response. In contradiction to the hypothesis of the current study, no relationship was found between emotional response to the initial goal violation and subsequent goal violations (Curry et al., 1987; Wagner & Heatherton, 2015). However, participants did often mentioned negative emotions as the cause of their initial goal violation. Indicating that that negative emotions elicited by the situation in which a dieter violates her goal may be more important than previously experienced emotions. An explanation for this is that emotions are temporary and fade within a short period of time (Gibson, 2006; Robinson & Clore, 2002). A negative emotional response that was elicited by the initial goal violation will therefore not be recognized in the same intensity after some time has passed. This idea is supported by the negative correlation between the reported strength of the emotional response and the amount of days ago that the initial goal violation took place (see Table 1). This suggests indeed that participants reported to experience less negative emotions as time passed by. This makes it difficult to accurately retrospectively report previous experienced emotions (Robinson & Clore, 2002). Not to mention, the short lifespan of emotions may not just affect the recall of emotions but at the same time also affect the impact of emotions on behaviour. It is imaginable that currently experienced emotions have an effect on behaviour in the present, while past experienced emotions do not continue to influence present behaviour. That being the case, it makes sense that emotions experienced at after the initial diet violations did not affect subsequent goal pursuit of dieters in the following days.

The final and most crucial finding is that participants do violate their diet, and most of them do so quite often. Only an insignificant small part of the dieters (2.7%) did not violate their diet during the second half of this study. In other words, most people that had a diet goal, were not able to successfully pursuit this goal for 4 straight days without violating it, showing that goal violations really are inevitable. The fact that participants failed their diet about four

times during this short period of time, could be an indication that these diet violations were not isolated incidents. Because the participant group is truly an internal attribution group, this could be a sign that internal attribution did indeed lead to more subsequent failure. However given the limitations of this study, this cannot be concluded with any degree of certainty. What can be concluded, is that these findings show once again the importance of conducting studies to investigate the consequences of failure. The fact that incidental diet failure is unavoidable, makes it worthwhile to conduct more research into the aftermath of diet failure in order to learn how to prevent a snowball effect of subsequent failure.

The present study is certainly not without limitations. The first limitation is that causal attribution was measured through self-report. Participants were free to report their own causal attributions. As a result, there were no fixed internal and external attribution groups that could be compared with each other. This made it impossible to properly test the hypotheses with the data of the current study. To prevent this problem in future research, a good option is to manipulate the causal attribution. Half of the participants can be thought in a reattribution training to attribute their failures to internal factors, while the other half can be thought to attribute their failures to external factors (Sinha & Gupta, 2006). This way, the participant group will not merely exist of people that internally attribute their failures and the existence of two comparable groups can be assured. This will make it possible to examine if causal attribution truly is an important determinant of the snowball effect of subsequent diet failure.

Another limitation is that the effect on subsequent failure is measured over different days instead of the same day. Keeping in mind that emotions only last for a short period, it can be expected that negative emotions would have more impact in a shorter time frame (Robinson & Clore, 2002). For future research, it would be interesting to conduct the same study in a shorter time frame and look at the effect of subsequent failure of dieters within the same day.

Finally, causal attribution was assessed for the initial goal violation, but not for the subsequent failures. Therefore, it is only known how the participants attributed the goal violation on one single moment. It could be the case that people are not consistent in the way they attribute their failures. For future research, it would be interesting to assess the way that dieters causally attribute their failures on different moments in time to check this assumption.

To conclude, no effect was found between causal attribution and subsequent diet failure. This is possibly due to the lack of variance in causal attribution. Because there was no relationship found, it was not possible to test the mediating role of emotional response. Therefore, based on the findings of the present study it cannot be argued if the insights of the disinhibition effect and the AVE can be translated into the context of the snowball effect of diet failure. For future research it is strongly recommended to manipulate the causal attributions in order to investigate the effect of this possible determinant properly. Furthermore, it is advised to conduct the same study in a shorter time frame to study the influence of emotional response of a diet violation on the snowball effect of subsequent diet violations. Finally, the fact that participants frequently failed their diet during the course of the study, shows the importance to conduct more research into the snowball effect of subsequent failure in the context of dieting.

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Footnotes

[1]It should be noted that there are different dimensions of causal attributions. However, the focus of the current study lays just on one dimension, which in the literature is often called causal locus (Stiensmeier-Pelster & Heckhausen, 2018). Therefore, in the current study the term causal attribution is used to refer to this specific dimension of causal attribution.

[2]The baseline questionnaire included the diet goal question from the screening questionnaire as an extra control question. A shortened version of the Attribution Style Questionnaire (ASQ; Dykema, Bergbower, Doctora, & Peterson, 1996) and a shortened version of the Preference for Consistency Scale (PFCS; Guadagno & Cialdini, 2010) were also part of this questionnaire. However, variables that are measured with the ASQ and PFCS are beyond the scope of the current study. Therefore, these questionnaires will not be discussed in further detail.

[3] The following questions were also part of this questionnaire: 'During a typical week, on how many days do you eat something - a meal or a snack - that is not in line with your dieting goal?', 'During a typical week, how many times in total do you eat something - a meal or a snack - that is not in line with your dieting goal?', 'During a typical week, to what extent do you feel like you successfully follow your diet?' (answer scale ranging from ' 1 = not at all' to ' 7 = very much'). Furthermore, participants were asked, in comparison to before the goal violation, how much they felt motivated, in control, sad, confident and to what extent they had the intention to restrict their food intake. Participants were also asked, in comparison to before the goal violation, to what extent they felt like it was worthwhile to continue restricting their food intake for the rest of the day or from that moment on. Lastly, participants received questions that assessed if their attribution was specific or global, controllable or uncontrollable and stable or unstable. However, answers to these questions were beyond the scope of the current study.

[4]The following questions were also part of this questionnaire: ‘To what extent do you feel like successfully followed your diet overall during these past four days?’. Answer options was ranged from ‘1 = not at all’ to ‘7 = very much’. Furthermore: participants were asked to what extent they agreed with the following statements regarding their dieting behaviour: ‘Once I eat something that is not in line with my dieting goal, I feel that I am more likely to do it again’ and ‘When I eat something that is not in line with my dieting goal, I feel there is no point in adhering to my diet for the rest of the day, so I abandon my dieting standards for that day’. Answer options ranged from ‘1 = strongly disagree’ to ‘ 7 = strongly agree’. Answers to these questions were beyond the scope of the present study.