

**Disentangling Upward Social Comparison, Insecure Narcissism and Body Envy on  
Weight Loss Dieting: A Moderated Mediation Analysis**

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### **Abstract**

There is substantial evidence that WLD can be a risk factor for eating disorders (Schreiber et al., 2023). Therefore, it is crucial to understand what motivates WLD. A moderated mediation model was tested based on the sociocultural theory of body image and contemporary social comparison theory. We hypothesized that with increasing upward social comparison tendency (USCT), there would be higher body envy tendency (BET) and, following this, greater Weight Loss Dieting (WLD). This mediation pathway is hypothesized to be stronger in women scoring higher on insecure narcissism (IN). BMI was used as a control variable. A convenience sample of 206 female university students provided data on USCT, BET, WLD, IN, BMI, and demographics. A bootstrap analysis using PROCESS (Hayes, 2013) supported the model (95% *CI* [0.0166, 0.138]). BET mediated the relationship between USCT and WLD. Higher levels of BET strengthen the impact of USCT on WLD, leading to increased WLD. IN functioned as a moderator, with higher levels of IN increasing BET and, consequently, further increasing WLD. BMI was unrelated to WLD, implying that the effects occurred independently of body size. These women might benefit from a media literacy intervention about unrealistic "thin ideals" and emotion management strategies, especially if they are high in USCT and IN.

*Keywords:* Sociocultural theory, emotion, upward social comparison tendency, body envy tendency, weight loss dieting, insecure narcissism

## **Disentangling Upward Social Comparison, Insecure Narcissism and Body Envy on Weight Loss Dieting: A Moderated Mediation Analysis**

Weight loss dieting (WLD) affected 43.3% of college women who participated in a cross-sectional survey by Fayet et al. (2012). Unfortunately, existing research suggests that WLD may function as a risk factor for eating disorders: what starts with restricting the caloric intake or banning some foods from one's life can quickly lead to nutritional deficiencies, psychological distress, missing out on social events, or eating disorders (Schreiber et al., 2023). Hence, it is valuable to understand the motivation for WLD in college women. Understanding why they engage in WLD helps to invent measures to prevent WLD or develop treatment methods for restrictive type eating disorders that target the initial motivation for WLD. Contemporary research and theory in the body image domain suggest that upward social comparison tendency (USCT) with thinner and more attractive others significantly motivates WLD (Bair et al., 2014). However, no research was available about the emotional consequences of USCT and how they impact WLD as a stand-alone variable. With this in mind, this study aims to examine the mediating role of BET between USCT and WLD, predicting that USCT increases experiences of BET, which in turn increases WLD. Secondly, this research examines whether insecure narcissism (IN), an individual difference theoretically and empirically linked with USCT and WLD, moderates the relationship between USCT and BET and thereby affects WLD (Gordon & Dombek, 2010; Neufeld & Johnson, 2016). Specifically, higher levels of IN are hypothesized to lead to higher levels of BET, which in turn leads to higher levels of WLD.

Generally speaking, humans are inherently motivated to evaluate and compare their opinions and abilities (Buunk & Gibbons, 2000). Contemporary sociocultural theory of body image concerns suggests that peers, parents, and media reinforce people to compare themselves and internalize the ideals they are exposed to, such as the thin ideal (Schreiber et

al., 2023). Social comparison is a central part of the theory; it is a mechanism used to make sense of ourselves and the world around us (Buunk & Gibbons, 2000). Upward social appearance comparison conveys information about how far away one is from the thin ideal and how one can achieve said ideal (Schreiber et al., 2023). Consequently, upward social appearance comparison to those with the "ideal" body and internalization of this thin ideal may lead to cognitive discrepancy between the ideal and the actual body shape. This discrepancy may lead to body dissatisfaction and behaviours aiming to reduce the discrepancy, such as WLD (Bair et al., 2014).

USCT describes social comparison to one who is judged as being better than oneself on the characteristic of interest (Smith & Kim, 2007). The relationship between USCT and WLD was illustrated by Schreiber et al. (2023), who examined the effect of USCT on eating behaviour, specifically dieting and eating pathology. Social media users' involvement with health and fitness accounts positively correlated with upward social appearance comparisons, dieting, and eating pathology. Since envy commonly arises as the result of unfavourable upward comparisons with others (Smith & Kim, 2007), women high in USCT might be more susceptible to experiencing body envy.

According to Smith (2000), envy is an emotion that results from an upward social comparison, in this case, the comparison to a thinner woman. The dual focus of envy is emphasized: the focus changes between what one is lacking and what another person possesses, for instance, a thin body. The concept of envy encompasses negative affective feelings and attitudes toward one or several persons who possess a trait, an object, or something similar that one desires but cannot have; in this example, this would be a body that is perceived as thinner than the own (Smith & Kim, 2007). In their literature review, Smith and Kim (2007) characterize envy as a distasteful, painful, and hostile emotion. Furthermore,

it is associated with feeling inferior to or less worthy than another, feelings of unfairness, and other negative emotions such as anger (Smith & Kim, 2007).

In the context of contemporary sociocultural theory, an unrealistic thin ideal is promoted in Western society and reinforced by the media (Bair et al., 2014). This thin ideal is highly valued and serves as a standard of beauty and success (Bair et al., 2014). Desiring a thin body while another person already has it (or seems to have it in airbrushed photos) induces the feeling that one is inferior to the thinner person (Zong & Hawk, 2021). This inferiority to someone who is thinner may feel unfair, especially when incapable of reaching the desired goal (Van de Ven et al., 2011), which is more than likely regarding the unrealistically thin body ideal. Also, frustration may arise when trying to reach the other's weight but not getting close to it and still repeatedly comparing oneself to thinner individuals (Zong & Hawk, 2021). Frequent media presentation of airbrushed photos and societal emphasis of this unattainable standard keep reminding women of their perceived shortcomings and thereby exacerbate feelings of body envy including frustration, and unfairness (Van de Ven et al., 2011).

Two possible social functions of emotions have been proposed at an individual level: informing about events or conditions that likely need to be acted upon or as a preparation to respond to issues and opportunities without having to be aware of them (Keltner & Haidt, 1999). Furthermore, it has been proposed that emotions function to define roles and status in social groups and to identify in-groups. Emotions also play a role in building a cultural identity (Keltner & Haidt, 1999). Applying this to the BET domain, the experienced body envy may signal that something should be changed about the situation, namely, the envious person should lose weight or adapt to society's beauty standards to gain an advantage or a better stand in society. Envy is seen as having the evolutionary purpose of driving the individual towards achieving resources that secure their (genes) survival (De Zoysa et al., 2021). Besides, looking at benign envy, there is a focus on achieving what the envied person

has; therefore, benign envy can function as a motivator to acquire a thinner body by WLD (De Zoysa et al., 2021). The aforementioned agrees with a study on the mediating role of envy between social comparison and appearance-enhancing behaviour: social comparison was manipulated to induce state envy, which in turn predicted a positive attitude towards several appearance-enhancing behaviours such as plastic surgery, WLD, and using a diet pill with potential health risks (Arnocky et al., 2016). In line with previous theory and research, this paper aims to test the prediction that higher BET will lead to increased WLD motivation in a non-clinical sample.

The entire mediation pathway that is predicted in this paper describes the effect of USCT on WLD through BET as a mediator, such that with increasing USCT, there will be greater BET and, therefore, increased WLD. However, it is also predicted that this mediation pathway will be stronger for women higher in IN. Specifically, this research predicts that for women higher in IN, the effect of USCT on BET will be stronger than for women low in IN, such that women higher in IN will experience more BET. Consequently, with higher levels of IN, WLD is also predicted to increase. IN is characterized by making one's self-worth dependent on other people's opinions, having a poor self-image, and, therefore, being insecure and longing for external approval. Shared characteristics with the other form of narcissism (grandiose narcissism, which is not discussed in this paper) are readiness to exploit other people for their own benefit, grandiose fantasies, and unrealistic expectations of favourable behaviour from others towards oneself (Gordon & Dornbeck, 2010). Individuals high in IN strongly emphasize physical appearance, which influences their feelings of self-worth and implies heightened risk for USCT and BET (Gordon & Dornbeck, 2010).

This emphasis is particularly relevant in contemporary Western culture, where thinness is highly valued and associated with status and success (Bair et al., 2014). People high in IN experience an increased need for attention and validation and generally experience more

feelings of insecurity. Therefore, the chances of feeling inferior to others or inadequate in a situation are increased if these needs are not met, which can be particularly distressing for them (Neufeld & Johnson, 2018). This heightened sensitivity to external validation and approval from society (Neufeld & Johnson, 2018) also implies a stronger commitment to societal standards, such as the thin ideal (Carrotte & Anderson, 2019). Adhering to the thin ideal is perceived as a pathway to greater status and social acceptance. Therefore, individuals high in IN could secure some external validation by adhering to the thin ideal (Carrotte & Anderson, 2019). Adding on, individuals high in IN are prone to feelings of inferiority and unfairness, which are already components of envy. Furthermore, the belief of being or deserving better than others but being deprived of better treatment explains perceptions of unfairness, frustration, and other components of envy (Neufeld & Johnson, 2016). The beliefs about being and deserving better than others may apply to several domains, including physical appearance and the rewards expected from society for adhering to the thin ideal (Qi & Cui, 2018).

The existing literature supports a correlation between IN and appearance-enhancing behaviours, which includes WLD (Gordon & Dornbeck, 2010). In their study, Gordon and Dornbeck (2010) were able to find a correlation between IN and eating disorder pathology using self-report questionnaires. They did not state how this effect is exerted but that there might be possible moderating variables. Across two studies, Neufeld and Johnson (2016) showed that IN robustly predicted envy. Literature on the effect of IN on WLD as a stand-alone variable through BET was not available. Based on these findings, the second prediction for the study of this article is that IN will enhance the relationship between USCT and BET and will thereby enhance WLD.

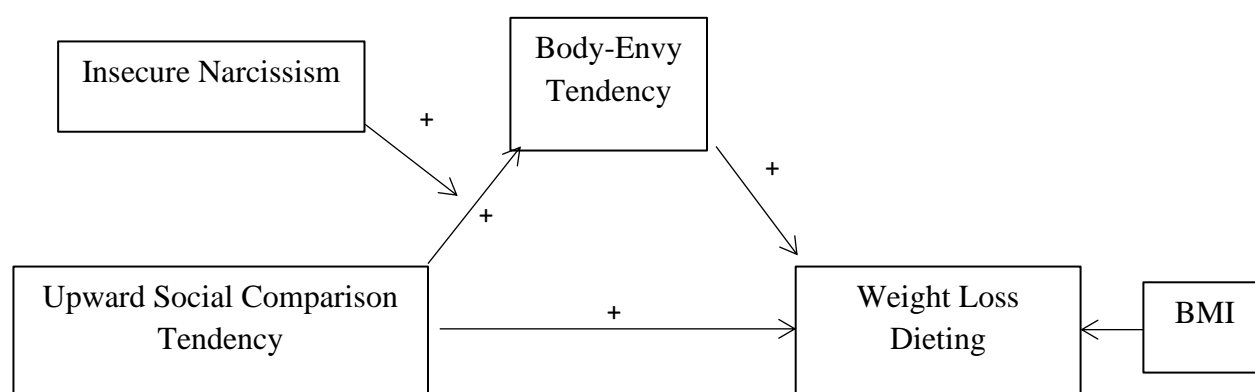
To finally predict the complete moderated mediation model, this research aims to test whether BET mediates the relationship between USCT and WLD, such that higher BET leads



to more WLD. Furthermore, this paper aims to examine whether this effect is enhanced by IN (Figure 1). The introduction showed that the concepts are theoretically linked, but some more profound or more specific insights into the mechanisms of how BET and IN exert their effects on WLD need to be examined. BMI serves as a control variable. Previous research shows that the effects of USCT often occur over and above BMI or body size. This is important because it might not be an objective but a subjective distance from the thin body ideal, which leads to WLD.

**Figure 1**

*The moderated mediation pathway*



*Note.* This figure shows the complete predicted moderated mediation pathway, including BMI as a control variable.

## Methods

### Participants

A convenience sample of 206 female students from a university or other higher education institution initially volunteered to participate in the study. Due to missing data, five participants were excluded, as well as one who gave obviously wrong answers (e.g. height = two centimeters). Consequently, the data of 200 women were used for statistical analyses in this study [age:  $M = 21.36$ ,  $SD = 2.72$ ]. The students had a mean BMI of  $M = 22.385$  with a standard deviation of  $SD = 4.542$ . In exchange for their participation, some received credits

for a university course. Of all participants, 45.5% were Dutch, 20% were German, and 34.5% had another nationality (American, Belgian, Brazilian, British, Bulgarian, Canadian, Chinese, Croatian, Colombian, Filipino, Finnish, French, Greek, Indian, Iraqi, Irish, Italian, Lithuanian, Polish, Romanian, Serbian, Slovak, Spanish, Slovenian, Turkish, Venezuelan or mixed). Furthermore, 85.5% of participants identified as white, 5% identified as Asian, 3.5% as mixed, 3% as other, 2.5% as Hispanic, and 0.5% as Black or African American.

## **Measurements**

### ***Upward Physical Appearance Comparison***

The upward physical appearance comparison scale (UPACS) was used to operationalize USCT, which measures the frequency of upward physical comparisons. It consists of ten items, such as: "I find myself comparing my appearance with people who are better looking than me." and "At parties or other social events, I compare my physical appearance to the physical appearance of the very attractive people." Participants had to rate themselves on a five-point Likert scale from 1 (never) to 5 (always). The mean of the scale was calculated per person. A higher score indicates a higher level of USCT. In previous studies, the Cronbach's alpha for the female sample was  $\alpha = .94$  (O'Brien et al., 2009). In line with this, the Cronbach's alpha of the scale in this study is  $\alpha = .956$ , which reflects excellent validity.

### ***Body Envy Tendency***

To operationalize BET, a scale of eight items was self-constructed based on contemporary theories by Smith and colleagues (1999) and Crusius (2019). Items of this scale measured the tendency of participants to experience body envy after physical comparison; examples are: "I am often bothered when I see women who are slimmer and more defined than me" and "I tend to think it's unfair that some women are slimmer and more defined than me." For this scale, a Likert scale was used where 1 (strongly disagree) and 5 (strongly agree). The mean of the scale was computed, with higher scores indicating a higher tendency to

experience body envy. The Cronbach's alpha of the scale in our study is  $\alpha = .902$ , which reflects excellent validity.

### ***Weight Loss Dieting***

To operationalize WLD, the Diet Intent Scale (DIT) was used, which consists of nine items that measure dietary restraint and weight maintenance behaviours in the past six months. This scale has no subscales since it solely measures dietary eating behaviours. Two examples from this scale are: "I take small helpings/portions (of food) in an effort to control my weight" and "I count calories to try to prevent weight gain." I used a 5-point scale that ranges from 1 (never) to 5 (always). The mean score of the scale was calculated, and a higher score reflect a greater frequency of WLD. In previous studies, the scale had a Cronbach's alpha of  $\alpha = .94$  and temporal reliability of .92 (Stice et al., 1998). The Cronbach's alpha of the scale in our study demonstrated excellent validity ( $\alpha = .934$ ).

### ***Insecure Narcissism***

IN was operationalized using the hypersensitive narcissism scale (HSNS) (Hendin & Cheek, 1997). This scale has ten items, including the following: "I often interpret the remarks of others in a personal way" and "I easily become wrapped up in my own interests and forget the existence of others." The HSNS is a subscale of Murrays 20 item narcissism scale. It is a 5-point Likert-type scale ranging from 1 (very uncharacteristic or untrue, strongly disagree) to 5 (very characteristic or true, strongly agree). The mean score was calculated per person. A higher score indicates more traits that relate to IN. Reliability lies at  $\alpha = .749$ . Convergent and divergent validity with the Dark Triad traits are good (Hendin & Cheek, 1997). In this study, the Cronbach's alpha of the scale is  $\alpha = .763$ , which is acceptable.

### ***Body Mass Index***

BMI functioned as a control variable. Participants provided their height and weight, and then their BMI was calculated in SPSS using the formula of weight (kg) divided by height

(cm) squared, and the result was multiplied by 10000. Self-reported measures of height and weight tend to fluctuate between 1%-3.5% in accuracy from the actual values (Bowman & DeLucia, 1992).

### **Procedure**

The Ethics Committee of the Psychology department at the University of Groningen approved the study. Before the formal data collection, a pilot study was conducted with a sample of six participants who were acquaintances of the researchers. The pilot study was carried out to assess typographical and process errors in the online questionnaire. There were no process errors found. Regarding typographical errors, the wording of one item was changed because it appeared to be confusing: the word “helpings” was substituted by "portions." Some changes to the punctuation were made, like adding a period. The survey was published through SONA (i.e., the online pool of Bachelor students at the University of Groningen participating for course credit), and researchers shared the survey link via their social networks. The data was collected between the 19th of April 2024 and the 14th of May 2024. The participants had to give informed consent before they could participate. The online questionnaire contained demographic information (e.g., gender, age, height, weight, nationality, and ethnicity). In order to avoid invalid data, all non-female respondents, participants who did not have at least a B2 level of English, and those who were not students at a university or another higher education institution were immediately redirected to the end of the survey. Then, measures of USCT, BET, WLD, and IN were taken. At the end of the survey, participants were given a list of ten steps that advised them how to turn negative body thoughts into a positive body image.

### **Statistical Analysis**

The hypothesized moderated mediation model (see Figure 1) was determined by testing the significance of the direct and indirect effects of the moderator through a

bootstrapping procedure ( $n = 5000$ ) in SPSS with “PROCESS” macro, model 7 (Hayes, 2013). Bootstrapping was used because it is robust in normality and can be used for small sample sizes (Igartua & Hayes, 2021). The moderated mediation analyses tested the effect of the moderator (IN) on the relationship between a predictor variable (USCT), a mediator (BET), and an outcome variable (WLD) (Igartua & Hayes, 2021). The index of moderated mediation indicates the difference in the indirect effect across the levels of the moderator variable (IN) (Igartua & Hayes, 2021). The significance of the index of moderated mediation is supported by the bootstrapping 95% confidence interval not containing a zero (Hayes, 2015).

## Results

### Assumption Checking

Prior to the statistical analysis, the assumptions for a correlational analysis were tested. A case-wise diagnostic revealed no outliers ( $> \pm 3$  SD) (Cook & Weisberg, 1982). Thus, the final sample size remained at  $n = 200$ . A P-P plot was created, and visual inspection showed that the plots were approximately on a straight line, indicating that normality was not violated (see Appendix Figure 1) (Ernst & Albers, 2017). A Durbin-Watson test showed a value of  $D = 2.074$ , confirming independence of residuals (Turner, 2020). A residual plot was created to check for homoscedasticity (see Appendix Figure 2). Visual inspection of the residual plot showed no funnel-like pattern, and therefore, the homoscedasticity assumption was not violated. Additionally, a histogram showed that the errors were normally distributed around zero, satisfying the linearity assumption (see Appendix Figure 3) (Ernst & Albers, 2017). Bootstrapping 5000 was used for the statistical analysis because it is robust for assumptions of normality and independence of errors (Wright et al., 2011). The multicollinearity assumption was met since all VIF values were below 10 (Abubakari, 2019). The Davidson-MacKinnon test, which is suitable for sample sizes of less than 250 participants, controlled for heteroscedasticity (Long & Ervin, 2000). The table below (Table 1) shows descriptives.

**Table 1***Pearson Correlations, Means, and Standard Deviations*

	1	2	3	4	5
1. UPACS	-				
2. DIS	.506**	-			
3. Envy	.694**	.564**	-		
4. HSNS	.366**	.178*	.369**	-	
5. BMI	-.109	.077	-.009	.007	-
Mean	3.033	2.227	2.332	2.896	22.385
SD	.981	.951	.971	.644	4.542

*Note.* UPACT: Upward Physical Appearance Comparison Tendency (for USCT); DIS: Diet Intend Scale (for WLD); Envy: body envy tendency; HSNS: Hypersensitive Narcissism Scale (for IN); BMI: Body Mass Index; SD: Standard Deviation

\*\*  $p < .01$ .

\* $p < .05$ .

### **Moderated Mediation**

A piecemeal approach was used to assess whether a significant moderated mediation effect occurred (Tarziu, 2018). First, the predicted mediation pathway was assessed using Hayes Model 4. Independently, the predicted moderation pathway was assessed using model

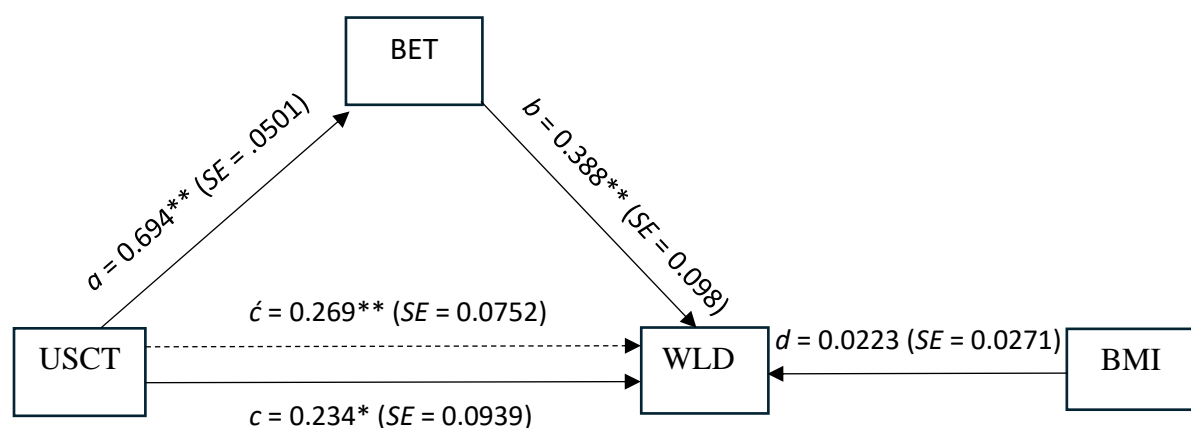
1. Lastly, the whole moderated mediation model was assessed using model 7, which estimates all parameters at once (Hayes, 2013).

### **Mediation Analysis**

First, it was assessed whether USCT indirectly affects WLD through BET as a mediator while controlling for BMI using Hayes (2013) model 4. As predicted, an overall significant effect for the mediation is present ( $F(\text{HC3}) = 35.456, p < .001$ ), with 35.42 % of the variance in WLD being explained by USCT and BET (see Figure 2). The direct effect of USCT on BET was significant ( $B = 0.694, SE = 0.0501, 95\% CI [0.595, 0.793], p < .001$ ). The direct effect from USCT on WLD was also significant ( $B = 0.234, SE = 0.0939, 95\% CI [0.0492, 0.419], p = .0134$ ), as well as the direct effect from BET on WLD ( $B = 0.388, SE = 0.098, 95\% CI [0.195, 0.581], p < .001$ ). The direct effect of BMI on WLD was not significant ( $B = 0.0223, SE = 0.0271, 95\% CI [-0.0311, 0.0756], p = .411$ ). Adding on, the indirect effect from USCT on WLD was significant ( $B = 0.269, SE = 0.0752, 95\% CI [0.129, 0.427], p < .001$ ).

**Figure 2**

#### *Mediation Pathway*



*Note.*  $N = 200$ . BET mediates the relationship between USCT and WLD while controlling for BMI.

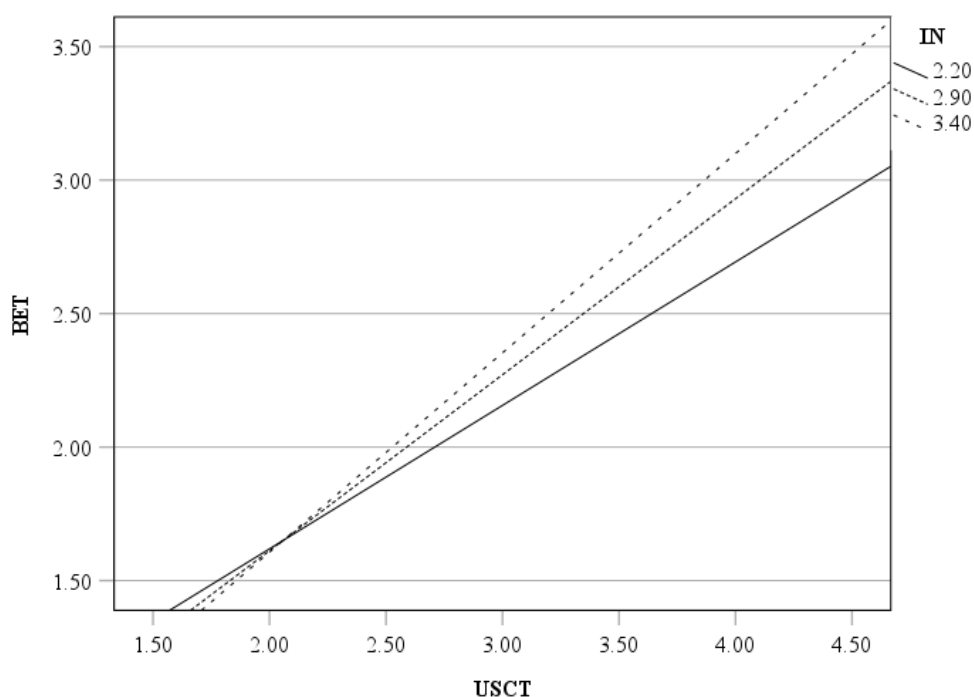
\* $p < 0.05$ , \*\* $p < 0.001$

### ***Moderation Analysis***

The next step was to determine whether IN moderates the relationship between USCT and BET while controlling for BMI. Applying Hayes (2013) model 1, a significant moderation model was found ( $F(\text{HC3}) = 50.617, p < .001$ ), with 51.62% of the variance explained by the predictors. All direct effects were non-significant: USCT on BET ( $B = 0.153, SE = 0.198, 95\% CI [-0.238, 0.546], p = .439$ ), IN on BET ( $B = -0.358, SE = 0.229, 95\% CI [-0.811, 0.0941], p = .119$ ), BMI on BET ( $B = 0.0174, SE = 0.0153, 95\% CI [-0.0127, 0.0475], p = .256$ ). Even though there was no significant main effect, there was a significant interaction effect of USCT and IN on BET ( $B = 0.174, SE = 0.0688, 95\% CI [0.0384, 0.31], p = .0122$ ). As predicted, the relationship between USCT and BET significantly increased with the increase in IN (Figure 3)

**Figure 3**

*Moderation effect*



*Note.* Visualized is the relationship between USCT and BET at low (2.2), moderate (2.9), and high (3.4) levels of the moderator IN. BMI was the control variable.

***Statement of Moderated Mediation Index***



Lastly, the complete moderated mediation model was analyzed using Hayes's (2013) model 7. The index of moderated mediation is depicted by the slope of the line, which illustrates the relationship between the moderator variable (IN) and the indirect effect (Hayes, 2015). The model was found significant after looking at the moderated mediation index ( $B = 0.0676$ ,  $SD = 0.0311$ , 95%  $CI [0.0166, 0.138]$ ). Consequently, and in agreement with the predictions, BET mediated the relationship between USCT and WLD, and this effect is more substantial with increasing levels of IN.

### **Discussion**

Society holds up a thin ideal that is promoted by the media. This thin ideal motivates women to engage in upward social appearance comparison and WLD after they compare unfavourably (Bair et al., 2014). It is still unclear how exactly this effect is exerted and what role emotions play in this. Therefore, this paper aims to test the role of specific emotions and character traits, namely BET and IN. It was predicted that USCT to thinner women would cause greater BET, and to reduce this negative emotion, women would engage in more WLD. BET was expected to function as a mediator between USCT and WLD. Higher levels of IN should exacerbate this relationship between USCT and BET because women high in IN are more prone to USCT and BET. Since the thin ideal is very extreme and vigorously promoted by media, peers, and family, this effect is expected to occur independently of body size/BMI. The results fully supported the predictions and agree with previous research.

### **Theoretical and Practical Implications**

Firstly, the results are in line with the sociocultural theory of body image concerns, in which social comparison is a central component (Buunk & Gibbons, 2000). The theory states that humans are inherently motivated to compare themselves to evaluate their social standing, thereby internalizing society's standards and ideals. USCT with the thin ideal leads to negative emotions and body dissatisfaction, which may motivate women to lose weight (Buunk &

Gibbons, 2000; Schreiber et al., 2023). In this study, the women indeed engaged in upward social appearance comparison, which led to increased BET when the other person was thinner. BET functioned as a motivator for WLD. Sources for social comparisons often reinforce the thin ideal and deliver information about how to achieve it (Schreiber et al., 2023; Buunk & Gibbons, 2000). USCT to a thinner person, was linked to higher BET, and women may engage in WLD to get closer to the thin ideal and thereby reduce this unpleasant feeling. The research is in line with definitions and functions of envy, such as envy arising from unfavourable comparisons (Smith, 2000) and envy functioning as an indicator of when one should change something to gain an advantage in society (Keltner & Haidt, 1999). In this case, USCT to thinner women led to body envy. This in turn motivated women to engage in WLD in hopes of gaining an advantage in society, for instance a better status. Lastly, the results are in line with characteristics of IN, suggesting that people who score high on IN are more prone to experiences of inferiority and inadequacy after upward comparisons, which are also components of envy (Neufeld & Johnson, 2018). The findings agree with research suggesting that people high in IN strongly emphasize physical appearance (Gordon & Dombeck, 2010). With this in mind, it adds up that experiences of body envy occur more often in people with higher levels of IN.

Taken together, evidence consistently suggests that USCT to someone whom one considers skinnier than oneself gives rise to experiences of negative emotions, such as body envy (Smith, 2000). BET mediates the relationship between USCT and WLD throughout the literature and this study, such that higher levels of BET increase WLD (Arnocky et al., 2016). BET is characterized by a longing for what one is lacking and what another possesses, which is revealed through upward social comparison (Smith, 2000). In this case, USCT leads to BET, which motivates the desire to become thinner through WLD. In previous research, (benign) envy was also described as having motivating qualities (De Zoysa et al., 2021).

WLD may be a precursor to eating disorders, which indirectly makes experiences of USCT that lead to BET problematic (Schreiber et al., 2023). However, BET and USCT explained a substantial amount of the variance in WLD but not all of it, so there might be other variables influencing WLD that should be tested in future research, such as shame or guilt. Besides, higher levels of IN increased the relationship between USCT and BET, which is consistent with previous research suggesting that IN robustly predicts envy (Neufeld & Johnson, 2016). Individuals who score high in IN experience more body envy and thereby have an increased motivation for WLD. This confirms research suggesting that individuals with high levels of IN strongly emphasize their physical appearance and make their self-esteem dependent on it (Gordon & Dombeck, 2010).

Important to note is that the effect of the moderated mediation occurred independently of BMI, which is consistent with a study by Fayet et al. (2012), where a vast majority of those dieting had a normal BMI. This suggests that the thin ideal and the wish to conform to it are powerful, so that it affects women who are of normal body size/BMI. This suggests that a potential target group for interventions is broad. Nevertheless, prior research has mixed findings on the influence of BMI on BET or WLD. For instance, a study by Arnocky et al. (2016) found no relationship between WLD and BMI. Another experiment with a clinical sample found that participants with a higher BMI felt less envy (Grynberg et al., 2019). More research on the influence of body weight/BMI on BET and WLD should be carried out in the future.

Anyway, the importance of interventions is especially high for college women high in both USCT and IN because these variables together increase levels of BET significantly. A media literacy program where college women are educated about the unrealistic body ideals presented in the media could be an intervention. Feelings of body envy, including inferiority and unfairness, may possibly vanish if the women realize they were feeling them towards

something that does not exist without digital manipulation. They might consume media more critically after being educated about the high frequency of digital manipulation. Furthermore, emotion management, for instance, through CBT, could be helpful in overcoming BET without WLD. A previous study suggests that CBT can help overcome envy or not act impulsively on it by helping the client recognize sources of envy that are beyond their control and accept the emotion. CBT could also provide tools for identifying maladaptive automatic thoughts and schemas, such as internalizations of an unrealistic thin ideal, and techniques to address those (Leahy, 2020).

### **Limitations**

This study exhibits some potential limitations, such as being cross-sectional and, therefore, correlational. No causal conclusions can be drawn from the results. Future research could investigate the components of this study in an experiment, enabling the researchers to make causal inferences. They could, for example, manipulate USCT by giving the participants images of very thin and pretty women and have them engage with the images by writing a detailed description of them. Then, their measures of BET and WLD intentions could be compared to a group that saw images of average-looking people. The body envy scale was self-constructed and needs to be replicated and validated. Additionally, no distinction between benign and malicious body envy was made, although research suggests that these two types are distinct. Malicious envy focuses on wanting to take away the other person's advantage, while in benign envy, someone focuses on achieving for themselves what the envied person has (De Zoysa et al., 2021). Since this study concentrated on BET leading to WLD, which is an act to achieve a goal (weight loss), this reflects the concept of benign envy. Future research could make this distinction in the study design or investigate the differences between the types of body envy in relation to WLD. Adding on, the study design did not control for ethnicity, though different cultures may have different body ideals (Warren & Akoury, 2020).

Furthermore, the sample in this study was a convenience sample, which limits generalizability. The fact that the sample only included women who studied at a university or another higher education institution adds to that limitation. To increase generalizability, future research should use a random and more diverse sample or test different samples regarding age, gender, educational background, and ethnicity. Adding on, it would be interesting to replicate the study in a clinical sample to see whether the effects differ in strength. Some research suggests that individuals with a restrictive-type ED show more signs of benign envy and social comparison behaviour, and this effect was more substantial in those with a lower BMI (Arnocky et al., 2016).

### **Conclusion**

To conclude, in line with other research, these findings suggest that BET mediates the relationship between USCT and WLD, with higher levels of BET increasing WLD. Also, IN moderates the relationship between USCT and BET, with higher levels of IN increasing BET and, thereby, increasing WLD. This effect occurs independently of body weight/BMI in this study, but previous research has mixed findings. Interventions targeting education about unrealistic, thin ideals and emotion management could help to reduce WLD, which can function as a precursor for eating disorders. High attention in interventions should be paid to populations high in USCT and IN because they will be higher in BET than others.

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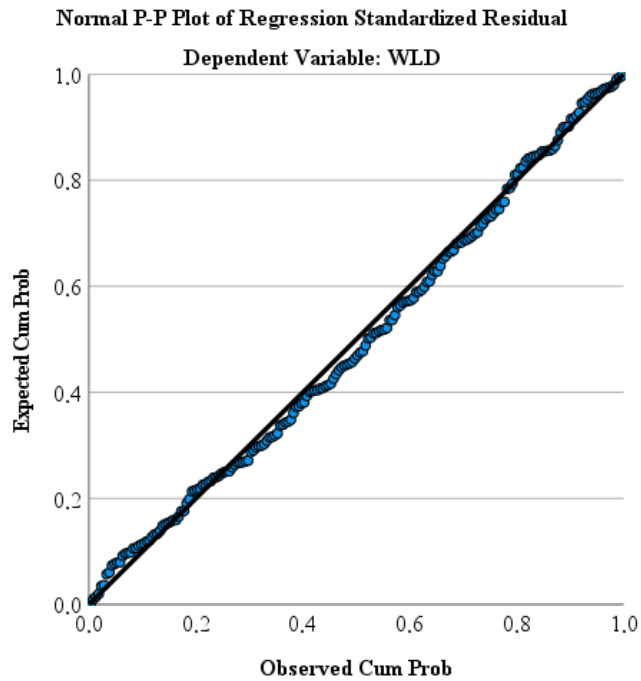
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## Appendix A

### Graphs for Assumption Checks

**Figure 1**

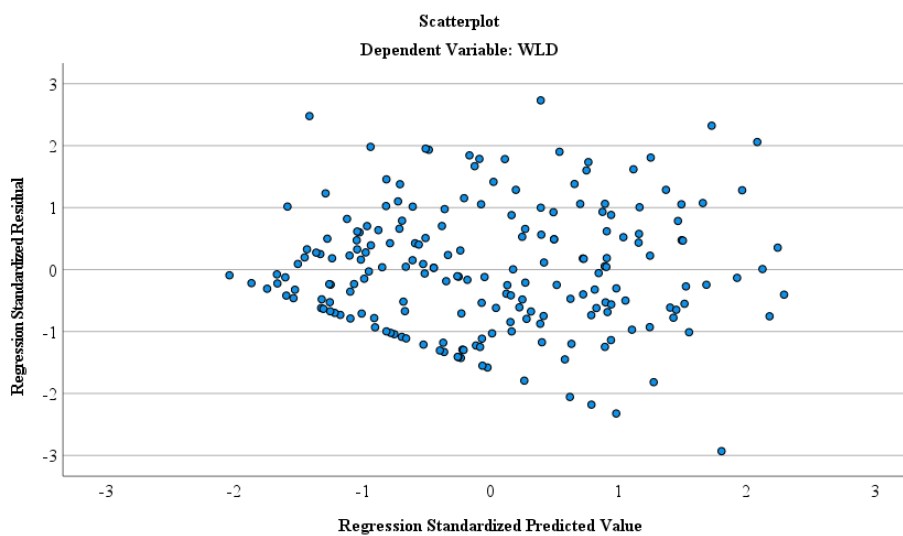
*P-P plot for normality assumption check*



*Note.* The points in the plot align relatively straight so that normality can be assumed.

**Figure 2**

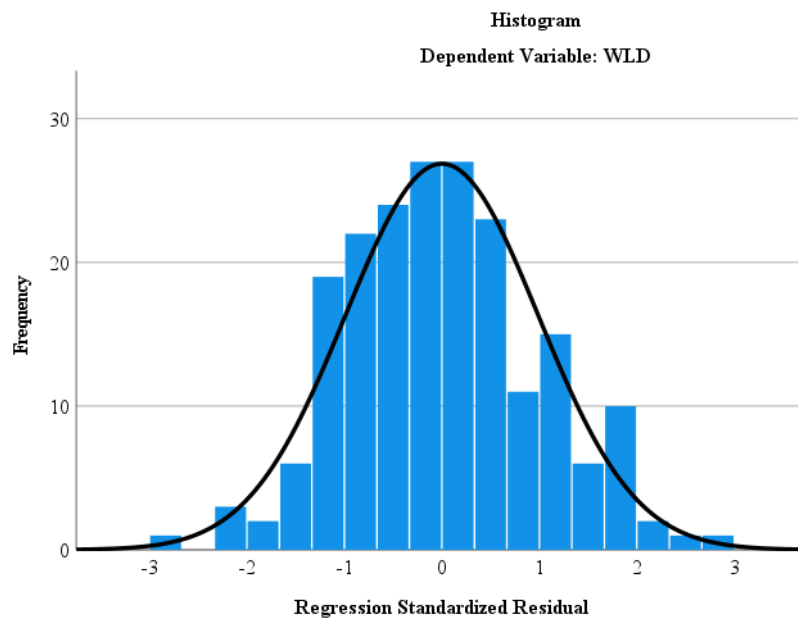
*Scatterplot for homoscedasticity assumption check*



*Note.* No clear pattern is visible in the scatterplot, which suggests homoscedasticity.

**Figure 3**

*Histogram for linearity assumption check*



*Note.* The residuals approximately follow a normal distribution; therefore, the linearity assumption is met.