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Brief Report

# Longitudinal Relationships between Financial Difficulties and Eating Attitudes in Undergraduate Students

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## Abstract

Objective: Previous research has shown a relationship between financial difficulties and poor mental health in students, but there has been no research examining such a relationship for eating attitudes.

Method: A group of 444 British undergraduate students completed the Index of Financial Stress and Eating Attitudes Test 26 item version at up to four time points across a year at university.

Results: Higher baseline financial difficulties significantly predicted higher eating attitudes scores at times 3 and 4 (up to a year), after adjusting for demographic variables and baseline eating attitudes score. Lower family affluence also predicted higher eating attitudes scores at time 4 (up to a year). A higher eating attitudes score at baseline also significantly predicted greater financial difficulties at time 2 (3-4 months). When considering these relationships by gender, they were significant for women only.

Discussion: Greater financial difficulties and lower family affluence predict a worsening in eating attitudes over time in female students. The relationship appears to be partially bi-directional.


Keywords: eating disorders; eating attitudes; financial difficulties; poverty; socio-economic status.

# Longitudinal Relationships between Financial Difficulties and Eating Attitudes in Undergraduate Students

Socio-economic status (SES) has long been related to mental health problems, with early research suggesting that poverty increases the risk of emotional problems in children and adolescents[1]. Depression is linked to lower family affluence[2], poor living standards[3] and financial difficulties[4]. A number of studies have also found a relationship between debt and an elevated risk of a range of mental health problems[5]. However the relationship appears somewhat different for eating disorders, with higher SES and living in more affluent areas increasing risk[6]. Those with anorexia nervosa are more likely to come from affluent families[7] and have parents with higher education[8].

University students have high levels of eating disorder symptoms. One US college study[9] found that 13.5% of women and 3.6% of men screened positive for an eating disorder, while 11.2% of a German female college population developed a full or partial eating disorder over a three-year period[10]. A number of studies have shown a relationship between debt and financial difficulties and poor mental in students[5], however there has been no research on financial difficulties and risk for eating disorders in this population. This study therefore used a longitudinal design to examine the between financial difficulties and eating attitudes in a sample of British undergraduates, hypothesising that increased financial difficulties will predict more severe eating attitudes and vice versa. This study also aimed to explore whether the effects of financial difficulties were independent of broader socio-economic status.

## Method

### Participants

Participants were all first-year undergraduate students at the point of recruitment. All participants who completed the baseline survey were then invited to complete the survey at three follow-up points. Those who completed only the baseline measures were excluded. A total of 444 participants completed the survey at baseline and at least one other time point, and were therefore included in the data analysis. The three follow-up time points were across

**Comment [RT1]:** Im going to leave this description as it is if that's ok: Reviewers have not asked for a change and I don't want to generate lots more questions for them to ask!

just over a year during their first two years at university, 3-4 months apart each time point. Participants were 77.5% (*N* = 344) female and 89.6% (*N* = 396) of white ethnicity. Their mean age was 19.9 years (range = 17-57). Figure 1 displays a recruitment flow diagram.

Insert Figure 1 here

Procedure

The data were collected as part of a wider study into student finances and mental health. Every university Students' Union in the UK was emailed and invited to advertise the research via email, websites or social media. Forty-six out of 114 universities agreed to do so. The survey was advertised as examining whether factors such as 'finances, demographics and alcohol use' were related to mental health in students. Due to the recruitment method, it is not possible to determine the response rate.

Measures

The participants completed three self-report questionnaires. The measures of eating attitudes and financial stress were completed at all time points, while the measure of family socio-economic status was completed only at the baseline.

Family Affluence Scale (FAS)[11]. This questionnaire measures familial socio-economic status, using questions such as 'Do you have a bedroom to yourself?'. Higher scores represent greater family affluence. The mean score for the current sample was 5.7 (*SD* = 1.6), which is similar to the norm of 5.3 for England[11].

**Comment [RT2]:** Yes definitely England!

Eating Attitudes Test-26 (EAT-26)[12]. This 26-item self-report questionnaire measures attitudes towards food and eating (e.g., 'I feel that food controls my life'). The total score was used in this study, with higher scores representing more severe attitudes and a score of 20+ suggests a possible eating disorder[12]. In the current sample, 5.1% (n=5) of men and 19.4% (n=67) of women scored 20+. Cronbach's alpha was .93 in this sample at time 1 and mean score was 12.6 (*SD* = 14, median = 8, range= 0-69) for women, and 6.1 (*SD*= 7, median=

3.5, range= 0-39) for men. The original validation paper showed a mean of 9.9 in female students in Canada[15].

Index of Financial Stress (IFS)[13]. The IFS measures financial difficulties over the past six months (e.g., 'Was unable to heat home'). Higher total scores represent greater financial difficulty. Cronbach's alpha was .70 and the mean score was 1.7 (*SD* = 1.7) in this sample at time 1. There are no norms to compare this score to.

Comment [RT3]: I've deleted reliability over time stats: put them in as I think reviewer suggested including in previous round of revisions but you're right they're not relevant

Data analysis

Data were analysed using SPSS version 21. Any participants who completed fewer than 50% of EAT-26 items were excluded. Individual missing items were replaced with the mode. The IFS was normally distributed. However, a Kolmogorov-Smirnov test demonstrated that the EAT-26 score was non-normally distributed ($D(444) = 0.19$, $P < .001$). Skewness was just within normal range (2.0), but kurtosis was out of normal range (4.7). The data could not be satisfactorily transformed as this is appropriate for skewness but not kurtosis. A ZREDIS*ZPRED plot suggested there was not any clear heteroscedasticity or non-linearity[a]. Hierarchical linear multiple regression was used, though it is important to acknowledge the limitations imposed by non-normal distribution. Listwise deletion was used for missing data The first set of regressions tested whether financial difficulties (IFS) at baseline predicted eating attitudes (EAT) at later time points, after adjusting for socio-economic status (FAS score), baseline EAT score, gender, ethnicity and age. The same analysis was then used to see whether EAT at baseline predicted IFS at later time points. Thus, six analyses in total were conducted. Significant findings were also repeated by gender to see whether the findings held for both male and female participants.

Comment [RT4]: I am saying multiple regression is therefore used as despite non normal distribution there is no heteroscedasticity so it is appropriate. I've removed therefore though so it's not confusing

## Results

Baseline scores and predictors of non-completion

Higher baseline EAT scores were significantly associated only with female gender: $\beta$=.19, $p$<.001. Higher baseline IFS was significantly associated with lower baseline FAS ($\beta$= -.26, $P < .001$), female gender ($\beta$= -.14, $P < .001$), and older age (17-19 vs. 20-29 $\beta$= .15, $P$

[a] Plot available upon request.

<. 001; 17-19 vs. 30+ $\beta$= .22, $P$ <. 001). Higher baseline FAS was associated with lower baseline IFS ($\beta$= -.27, $P$ < .001), older age (17-19 vs. 20-29 $\beta$= -.15, $P$ <. 001; 17-19 vs. 30+ $\beta$= -.18, $P$ <. 001), and white compared to 'Other' ethnicity ($\beta$= -.12, $P$ < .01).

A binary logistic regression was conducted to determine predictors of non-completion at time 3. This included age, gender, ethnicity, baseline and time 2 EAT, baseline IFS and baseline FAS. The overall model significantly predicted drop-out: $\chi 2$ = 11.61, $df$ = 5, $P$ < .05, 3.8%-5.1% variance explained. However no variables were significant predictors individually. The same formula was used for non-completion at time 4 with demographics, baseline EAT, time 2 EAT, time 3 EAT, baseline IFS and baseline FAS. The overall model did not significantly predict drop-out: $\chi^2$ = 2.87, $df$ = 5, $P$ > .05, 2.6-3.7% variance explained. No variables were significant predictors individually.

Impact of financial difficulties on later eating attitudes

Table 1 shows the association of time 1 variables with EAT scores at times 2-4. In all cases, the baseline EAT scores significantly predicted subsequent EAT scores (time 2 - $F$ [10,382] = 146.44, $P$ < .001, adjusted $R^2$ = .79;, time 3 - $F$ [10,243] = 39.54, $P$ < .001, adjusted $R^2$ = .60; time 4 - $F$ [10,217] = 54.73, $P$ < .001, adjusted $R^2$ = .70). When those associations were controlled for, there were still effects of financial variables. Higher baseline IFS scores predicted significantly higher EAT at time 3 and time 4, and lower FAS scores at baseline were also associated with significantly higher EAT at time 4.

**Comment [RT5]:** I've changed T2 to Time 2 etc throughout

Insert Table 1 here

Impact of eating attitudes on later financial difficulties

Table 2 shows the association of baseline variables with subsequent financial stress (IFS scores). The combination of demographics, baseline IFS and baseline EAT significantly

predicted IFS scores at all three time points (time 2 - $F$ [10,383] = 76.1, $P$ < .001, adjusted $R^2$ = .66;, time 3 - $F$ [10,254] = 30.83, $P$ < .001, adjusted $R^2$ = .53; time 4 - $F$ [10,225] = 18.27, $P$ < .001, adjusted $R^2$ = .42).. Baseline IFS scores were the strongest predictor in each case, though non-white ('Other') ethnicity was also a predictor of higher financial stress at all time points. Higher baseline EAT scores predicted significantly higher IFS scores at time two only.

Comment [RT6]: Yes this is right

Insert Table 2 here

Differences by gender

In order to determine whether the relationships between IFS and EAT held for both men and women, the data were split by gender and the above analyses repeated. There was no association between baseline IFS and EAT at time 3 for men ($\beta$= -.01, $P$ >. 05, $N$= 84) or women ($\beta$= .05, $P$ >. 05, $N$= 309) , Baseline IFS significantly predicted EAT at time 3 for women ($\beta$= .17, $P$ < .01, $N$= 201, but not men ($\beta$= .19, $P$ > .05, $N$= 53), and significantly predicted EAT at time 4 for women ($\beta$= .10, $P$ < .05, $N$= 178), but not men ($\beta$= .01, $P$ > .05, $N$= 50). Baseline FAS significantly predicted EAT at time 4 for women ($\beta$= -.11, $P$ < .05, $N$= 178), but not men ($\beta$= -.11, $P$ > .05, $N$= 50). Baseline EAT significantly predicted IFS at time 2 for women ($\beta$= .09, $P$ < .05, $N$= 307), but not men ($\beta$= .02, $P$ > .05, $N$= 87). There were no associations between baseline EAT and IFS at time 3 for men ($\beta$= .09, $P$ > .05, $N$= 59) or women ($\beta$= .04, $P$ > .05, $N$= 206), and no associations with IFS at time 4 for men ($\beta$= -.06, $P$ > .05, $N$= 52) or women ($\beta$= .05, $P$ > .05, $N$= 184).

Comment [RT7]: I had only run by gender for the significant analyses but I see your point so have put in for females at time 2 as well

Comment [RT8]: I've added N

Comment [RT9]: I've done split by gender for EAT predicting later IFS even if not originally significant in line with your comments

## Discussion

This study examined the longitudinal relationship between financial difficulties and eating attitudes in university students. Greater financial difficulties predicted more severe eating attitudes up to a year later after controlling for baseline eating attitudes and

demographic variables. Previous studies have shown a relationship between financial difficulties and poor mental health in students[5]. This finding appeared to be independent from the impact of family affluence, with lower family affluence also predicting higher eating attitudes a year later. There was however no effect of family affluence on baseline scores, suggesting that lower family affluence leads to greater chronicity eating attitudes over time. This goes against previous studies showing higher family affluence in those with eating disorders[6,7], but in line with general population studies showing a relationship between lower SES and disordered eating.[14,15] The hypothesis of a bi-directional relationship was partly supported as more severe eating attitudes predicted greater short-term financial difficulties at 3-4 months. Thus those with more severe eating difficulties might be more vulnerable to short term financial difficulties.

However the results also indicate that there is a relationship between financial difficulties and eating attitudes in women but not men. This is in line with other findings of a link between parental education and eating disorders in women but not men[8], though it is important to note that the low sample size for men and resulting reduced statistical power may partially explain this finding. Thus, in female students, eating attitudes predict more severe short term financial difficulties in the short-term, but financial difficulties also predict greater eating attitudes up to a year later. This suggests the possibility of a 'vicious cycle' pathway for female students whereby negative eating attitudes increase the risk of financial difficulties in the short-term, these difficulties then serve to further exacerbate negative eating attitudes in the longer-term.

**Comment [RT10]:** I have added in this paragraph discussing gender: thankyou for your thoughts.

These links need to be further explored to confirm the relationship and determine causal mechanisms for the relationship. The relationship between financial difficulties and eating attitudes may relate to models suggesting binge eating represents a need to escape from self-awareness[16]. Those at risk of an eating disorder might be acutely sensitive to failures to manage a budget or cope financially, and binge eating might be a way to escape from this awareness of personal failings and associated negative affect. It may also relate to findings of low perceived control over external events in those with eating disorders[17,18], with

those who are high risk for an eating disorder being prone to feeling they are not in control of their financial situation, and therefore engage in restricting behaviours as a way to exert control in other areas of their life.

This study is limited by the self-selected sample which is heavily female and its use of a measure of eating attitudes rather than eating disorder behaviours. There is also a high level of drop out though there is no evidence that drop out was influenced by the variables measured here. The Family Affluence Scale is designed for use with adolescents so is not ideal for an adult population. The Index of Financial Stress measures difficulties over a six month period so there is a possible partial overlap between time points. It is important to note the limitations of using regression with data with high levels of kurtosis, and the small sample size for regression analysis split by gender. However, the findings suggest the need for further exploration of the link between greater financial difficulties and more severe eating attitudes, including studies of clinical groups and factors that might mediate or moderate these associations.

Note: The authors have no conflict of interest.

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