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The Relation Between Bulimic Symptoms and

the Social Withdrawal Syndrome During Early Adolescence

*Title*: The Relation Between Bulimic Symptoms and the Social Withdrawal Syndrome

During Early Adolescence


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Bulimic Symptoms and Social Withdrawal Syndrome

Abstract

**Objective.** The short-term longitudinal study tested the hypothesis that there was a prospective relation between the social withdrawal syndrome and Bulimic symptoms during early adolescence.

**Method.** Ninety-six adolescents (47 males, mean age = 13 years – 10 months) completed standardized scales assessing Bulimic symptoms, trust beliefs in others and loneliness at Time 1/T1 and again 5 months later at Time 2/T2).

**Results.** Analyses showed that: (1) bulimic symptoms were negatively correlated with trust beliefs, (2) bulimic symptoms were positively correlated with loneliness, and (3) trust beliefs were negatively correlated with loneliness. The SEM analyses showed that trust beliefs at T1 were negatively and concurrently associated with Bulimic symptoms at T1 and longitudinally (and negatively) predicted changes in Bulimic symptoms. It was found that loneliness at T1 statistically mediated those concurrent and longitudinal relations.

**Conclusion.** The findings yielded support for the conclusion that the social withdrawal syndrome, as assessed by low trust beliefs and resulting experiences of loneliness, contributes to bulimia nervosa during early adolescence.

Bulimic Symptoms and Social Withdrawal Syndrome

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## 1: Introduction

### 1.1 The Problem

Researchers have found that disordered eating (including eating disorders) during adolescence longitudinally predict internalized maladjustment (Ferreiro, Wichstrøm, Seoane, & Senra, 2014) and low socioeconomic achievement (Tabler & Utz, 2015). Guided by such findings, researchers have undertaken the task of identifying the factors that predispose individuals to acquire disordered eating during the adolescent period (e.g., Abede, Torgersen, Lien, Hafstad, & von Soest, 2014; Rohde, Stice, & Marti, 2015; Stice, Marti, & Rohde, 2013). The current study was carried out to continue that line of investigation. The study investigated the hypothesis that the social withdrawal syndrome (a tight association of low trust beliefs in others, low disclosure and high loneliness) predisposes individuals to demonstrate bulimic symptoms during early adolescence – the period during which bulimia nervosa is first observed (see Stice et al., 2013).

### 1.2 Empirical Support for the Social Withdrawal Syndrome Hypothesis

In an investigation of the SWS hypothesis, Rotenberg et al (2013) found that bulimic symptoms in young adults were associated with low trust beliefs in close others (mother, father, and friend), an unwillingness to disclose personal information to them, and high loneliness. The analyses yielded support for the SWS hypothesis that low trust beliefs to close others promotes an unwillingness to disclose personal information to close others, which promotes loneliness and promoted bulimic symptoms. According to the SWS hypothesis, low trust and corresponding loneliness produce an experience of being cut off from others and negative affect in individuals that reduces their dietary restraint and thus

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contributes to the cycle of food consumption and control (e.g., dieting, and laxatives)

typical of bulimia nervosa.

The SWS hypothesized causal sequence comprises the following: low trust beliefs ⟶

low disclosure ⟶ loneliness ⟶ bulimia. Is this an accurate account of how bulimia

emerges during adolescence? The research has not yet provided an adequate answer to this

question. There is evidence that loneliness is longitudinally predictive of disordered eating

from early to mid-adolescence adolescence (Abede et al., 2014) but the role of other

crucial components of the SWS hypothesis (e.g., trust) has not been examined. The current

study was carried out in order to redress that gap in our knowledge. It was guided by the

fact that short-term longitudinal studies (e.g., around 6-months) have successfully

examined developmental change, such as risks of medical errors (Tanaka et al., 2012) and

the effects of workplace bullying on job satisfaction (Rodríguez-Muñoz et al., 2009). The

current study was a short-term longitudinal investigation of the SWS hypothesis that social

withdrawal syndrome contributes to Bulimia as indexed by Bulimic symptoms during early

adolescence.

**1.4 Brief Overview of the Current Study and Hypotheses**

In the study a sample of early adolescents were administered standardized scales

assessing Bulimic symptoms, emotional trust beliefs in close others, and loneliness twice

across a 5-month span (Time 1/T1 and Time 2/T2). Emotional trust beliefs in close others

were assessed because bear most directly on the disclosure of person information.

Rotenberg et al.'s (2013) measures were employed but some items were modestly revised

in order to ensure that they suitable for early adolescents. The following was hypothesized

based on the social withdrawal syndrome hypothesis:

(1) Bulimic symptoms would be negatively correlated with trust beliefs in close others and positively correlated with loneliness. These associations would be evident as covariations between those variables at T1 in the SEM analysis.

(2) Loneliness would mediate the relation between trust beliefs in close others and Bulimic symptoms concurrently (i.e., at T1).

(3) A negative path would be found in the SEM analysis between trust beliefs in close others at T1 and loneliness at T1.

(4) A negative path would be found in the SEM analysis between emotional trust beliefs in close others at T1 and changes in Bulimic symptoms.

(5) A positive path would be found in the SEM analysis between Loneliness at T1 and changes in Bulimic symptoms.

(6) A negative path would be found in the SEM analysis between emotional trust beliefs in close others and changes in Bulimic symptoms and that relation would be mediated by loneliness at T1.

Bulimia nervosa has been found to be more prevalent in girls than in boys (see Stice et al., 2013) and therefore comparable gender differences were expected on bulimic symptoms. Whether or not gender moderated the observed relations was examined.

## 2.0 Method

**2.1 Participants**. At T1, the participants were 116 pupils enrolled in years 7 and 8 of a secondary school in the United Kingdom. This school was representative of schools across the UK as determined by the government Index of Multiple Deprivation. Of that sample, 101 (47 males and 54 females) with mean age = 13 year and 10 months (*SD* = 5 months) were tested at both T1 and T2. Individual *t*-tests confirmed that there were no appreciable differences between those participants who were tested at both time points and those tested at T1 only (*t*s < 1). An additional 5 participants did not complete some scale items and

their data was removed from the analyses. The final sample was composed of 96

participants across the two testing times. Less than 5% of the data was missing which was

replaced by mean values.

**2.2 Measures**

**2.2.1 Bulimic Symptoms.** This was assessed by the Bulimic cognition and Bulimic

behavior subscales of the Stirling Eating Disorder Scales (SEDS, Williams et al., 1994).

The two SEDS scales have been found to demonstrate reliability and validity (Williams et

al., 1994). In the current study the bulimic cognition scale was correlated with the bulimic

behavior scale, $r(99) = .70$, $p < .001$ at T1 and $r(95) = .51$, $p < .001$ at T2. Therefore the

two subscales were summed to yield a total scale Bulimic scale score at T1 and T2.

Greater values on this scale denoted greater Bulimic Symptoms. The Bulimic symptoms

scale is coded by weighted items that correspond to endorsements by individuals with

clinically diagnosed Bulimia nervosa (see Williams et al., 1994). As a consequence, the

scale scores are not continuous evidenced by the Bulimic scale at T2 demonstrating

Skewness (2.14) and Kurosis (4.96). In order to attain a normal distribution, the Bulimic

symptom scores at T1 at T2 were subjected to a log10 transformation. The Bulimic

symptoms scale demonstrated stability across time as shown by the correlation between the

scale at the two testing times, $r(94) = .53$, $p < .001$.

2.2.2 **Trust beliefs**. The 10-item Specific Interpersonal Trust gender-common scale

(SIT: Johnson-George & Swap, 1982) was used to assess trust beliefs in each of four target

persons (mother, father, friend, and teacher). The judgments were made on a 9-point

Likert scales. The SIT scale was has been found to demonstrate acceptable internal

consistency and validity (Johnson-George & Swap, 1982; Rotenberg et al., 2010). In the

current study, acceptable internal consistency was found for the trust beliefs in mother,

father, friend and teacher with αs = .87. .91, .91 and .86, respectively at T1, and αs = .87.

.91, .91, and .89 respectively, at T2.

The scores for the four targets were subjected to principle component analyses at each

testing time. The analyses at T1 yielded a single factor with an eigen value of 2.48

(accounting for 62% of the variance) and weightings of .82, .82, .78, and .73 for mother,

father, friend, and teacher, respectively. The analyses at T2 yielded a single factor with an

eigen value of 3.31 (accounting for 82% of the variance) and weightings of .91, .90, .91,

and .91 for mother, father, friend, and teacher, respectively. The regression factor scores

from those analyses – representing a sum of the scale items -- were used in the

correlational and regression analyses. Higher scores denoted greater emotional trust

beliefs (ETBCO). The Trust beliefs demonstrated stability across time with an appreciable

correlation between the scale at the two testing times, $r(99) = .49$, $p < .001$. Table 1

presents the mean and SD of ETBCO as a sum of the raw items.

2.2.3 **Loneliness**. This was assessed by the 20-item revised UCLA Loneliness Scale

(Version 3) which has been found to demonstrate reliability and validity (Russell, 1996).

The judgments were made on a 5-point Likert scales. In the current study, the scale

demonstrated acceptable internal consistency, α = .90 at T1 and α = .90 at T2. Higher

scores denoted greater loneliness. The Loneliness scale demonstrated stability across time

by the correlation between the scale at the two testing times, $r(94) = .65$, $p < .001$.

### 3.0 Results

**3.1: Gender Differences.** As expected, at T1 girls (M = 13.63, SD = 12.18) showed

greater Bulimic symptoms than did boys ($M = 8.12$, $SD = 8.79$), $t(93.8) = 2.52$, $p = .01$;

equal variances not assumed. Those differences were in the same direction at T2 with girls

($M = 10.77$, $SD = 11.63$) tending to show greater Bulimic symptoms and did boys ($M = $

7.91, *SD* = 12.28) but those differences did not attain or approach statistical significance.

There were no appreciable gender differences on the other measures.

**3.2: Correlations Between the Measures**. The correlations between the measures

(with means and *SD*s) are shown in Table 1.  There were appreciable correlations across

time for each of the measures (as noted) that showed stability of the measures. As

expected, Bulimic symptoms were: (1) negatively correlated with trust beliefs; and (2)

positively correlated with loneliness both T1 and T2.  Also, as expected, trust beliefs were

negatively correlated with loneliness at both T1 and T2.  There were no appreciable gender

differences in the correlations or in the other relations examined.

**3.3: Structural Equation Modelling Analyses.** The SEM analyses showed that the

hypothesized SWS model was a good fit of the data with the $\chi^2(1) = 1.43$, $p = .23$, NFI =

.98, CFI = .99, and RMSEA  = . .068. A nonsignificant Chi square, NFI and CFI > .90 and

RMSEA <.07 shows that the model provides a good fit of data (Hu & Bentler 1999). Tests

developed by Preacher and showed that the SEM analysis demonstrated sufficient power,

(97%) and met the minimum number of 55 participants to achieve the required 80% power.

The SEM analyses confirmed the following hypothesized relations: (1) a positive path

between Bulimic symptoms at T1 and Bulimic symptoms at T2 as evidence of stability; (2)

negative path between trust beliefs at T1 and Bulimic symptoms at T1; (2) a positive path

between loneliness at T1 and Bulimic symptoms at T1; (3) a negative path between trust

beliefs at T1 and loneliness at T1; (4) a positive path between loneliness at T1 and changes

in Bulimic symptoms.

**3.4: Tests of Mediation and Alternative Paths.**  We used the method of testing

mediation recommended by Preacher and Hayes (2004) with 2000 bootstrap resamples

tests.  The tests of mediation were carried out on the concurrent data and on the

longitudinal data. The test of concurrent data at T1 showed that there effects of trust beliefs

at T1 (the predictor) on loneliness at T1, $b$ = -.34 (s.e. = .07), $p < .001$ (the mediator) and

that there were indirect effects of trust beliefs at T1 on Bulimic symptoms at T1 by

loneliness at T1, $b$ = .01 (s.e. =.004), $p < .001$. The bootstrap results for the 95%

confidence level were -.007 for the lower confidence level and -.011 for the upper

confidence level. Because zero did not fall within this range, loneliness at T1 served as a

statistical mediator of the relation between trust beliefs at T1 and Bulimic symptoms at T1.

The tests of mediation on the longitudinal data demonstrated that there were effects of

trust beliefs at T1 (the predictor) on loneliness at T1, $b$ = -.34 (s.e. = .07), $p < .001$ (the

mediator) and that there were indirect effects of trust beliefs at T1 on changes in Bulimic

symptoms by loneliness at T1, $b$ = .02 (s.e. =.010), $p = .05$. The bootstrap results for the

95% confidence level were -.0155 for the lower confidence level and -.0001 for the upper

confidence level. Because zero did not fall within this range the findings showed that

loneliness at T1 statistically served as a mediator of the relation between trust beliefs at T1

and changes in Bulimic symptoms at T1.  It should be noted that if a path between trust

beliefs at T1 and changes in Bulimic symptoms is included in the model, then it did not

attain statistical significance ($\beta$ = -.13, $p = .22$).  By contrast, that path attains significance

if loneliness at T1 is removed from the model depicted in Figure 1 ($\beta$ = -.20, $p = .04$)

which supports the conclusion that loneliness at T1 fully mediated the relation between

trust beliefs at T1 and changes in Bulimic symptoms.

## 4.0 Discussion

**4.1: Summary of the Findings.** The study yielded support for the SWS hypothesis.  At

each testing time, it was found that: (1) bulimic symptoms were negatively correlated with

trust beliefs and positively correlated with loneliness, and (2) trust beliefs were negatively

correlated with loneliness. The SEM analyses confirmed that there was a negative direct

path between trust beliefs at T1 and Bulimic symptoms at T1 and that trust beliefs

negatively predicted changes in Bulimic symptoms. Finally, it was found that loneliness at T1 mediated the negative relation between trust beliefs and Bulimic symptoms concurrently (at T1) and changes in Bulimic symptoms across time. It was found that girls showed greater bulimic symptoms than did boys which complements other research (see Stice et al., 2013). Gender was not found to moderate the observed relations, however.

**4.2: The Social Withdrawal Syndrome Hypothesis.** The current study comprised a short-term longitudinal that examined the relations among bulimic symptoms and the social withdrawal syndrome variables in early. The study confirmed the expected relations between bulimic symptoms and the measures of the social withdrawal syndrome during early adolescence -- the period during which Bulimia first emerge. The current findings complement the finding by Abede et al., (2014) that loneliness is longitudinally predictive of disordered eating from early to mid-adolescence adolescence. The current research expands that investigation by highlighting the role of low trust beliefs as a predictor of disordered eating, specifically Bulimic symptoms, as well as loneliness that promotes those disorders. The current findings complement the broader range of studies which identify the factors that predispose individuals to acquire disordered eating during the adolescent period (e.g., Ferreiro et al., 2014; Rohde et al., 2015).

**4.3. Limitations and Future Directions.** The current study was limited because it did not examine clinically diagnosed bulimia nervosa. Individuals with clinically diagnosed bulimia nervosa would be likely be inclined to demonstrate social withdrawal syndrome, though because it has been found that they vulnerable socially stigmatization (Roehrig, & McLean, 2010) and shame (Swan & Andrews, 2003). Also, we found that low trust beliefs predicted changes in Bulimic symptoms and thus is probable causal between trust beliefs and Bulimic symptoms. Nevertheless, studies with more long-term longitudinal designs are needed to fully test the social withdrawal syndrome hypothesis.

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Table 1: Correlations Between the Measures (with Means and SDs)

| Measure | Mean | SD | TBT1 | LoneT1 | BST2 | TBT2 | LoneT2 |
|---|---|---|---|---|---|---|---|
| *Time 1* | | | | | | | |
| Bulimic Symptoms | .86 | .49 | -.46*** | .42*** | .50*** | -.25* | .37*** |
| Trust Beliefs (TB1) | 84.42 | 14.78 | | -.45*** | -.39*** | .51*** | -.39*** |
| Loneliness (LoneT1) | 37.40 | 11.18 | | | .43*** | -.45*** | .65*** |
| *Time 2* | | | | | | | |
| Bulimic Symptoms (BS2) | .77 | .49 | | | | -.31** | .37*** |
| Trust Beliefs (TB2) | 89.17 | 19.85 | | | | | -.44*** |
| Loneliness (Lone2) | 38.06 | 11.92 | | | | | |

Note:* $p < .05$, ** $p < .01$, and *** $p < .001$; *Dfs* = 94.

Caption

Figure 1: SEM Analyses of the Hypothesized Model
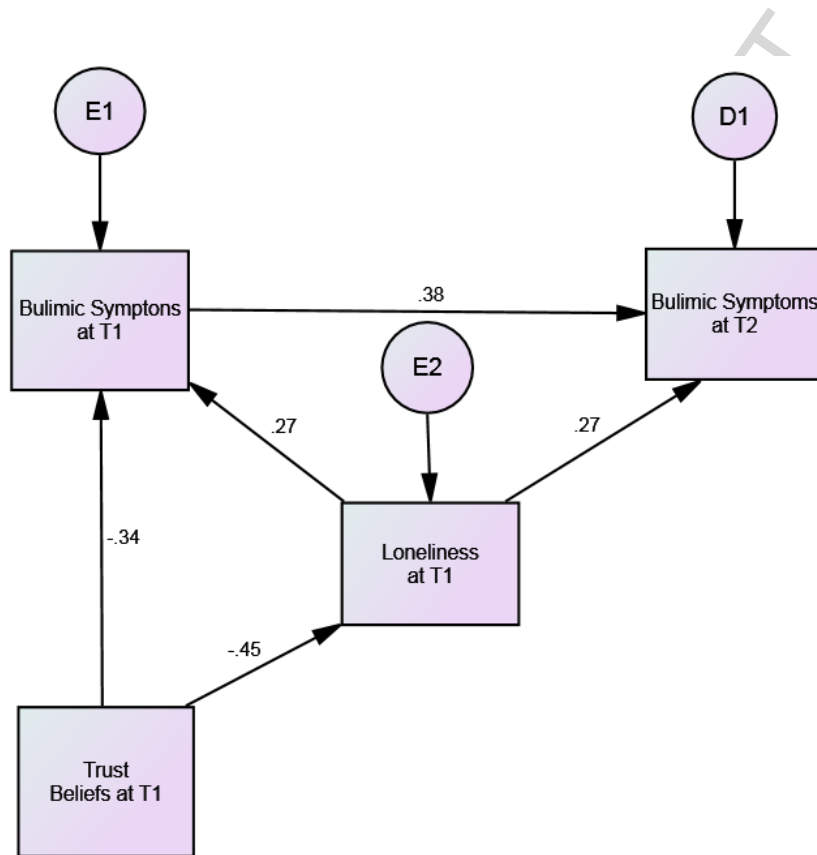
Bulimic Symptoms and Social Withdrawal Syndrome

Highlights

- ➤ Tested whether social withdrawal promoted the Bulimic eating disorder during early adolescence.

- ➤ One hundred and one early adolescents completed standardized scales twice across a 5-month span.

- ➤ Trust Beliefs in Others was negatively correlated with Bulimic symptoms and positively correlated with Loneliness: those were positively correlated.

- ➤ Changes in Bulimic symptoms were negatively predicted by Trust Beliefs in Others and positively predicted by Loneliness.

- ➤ In support of the social withdrawal hypothesis, bulimia nervosa was promoted by low trust beliefs and loneliness during early adolescence.