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Co-Rumination, Psychological inflexibility, and Internalizing Symptoms in Adolescence

A thesis
presented to
the faculty of the Department of Psychology
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Master of Arts in Psychology

by
John Parigger
August 2024

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Keywords: Adolescence, Co-Rumination, Psychological Inflexibility, Anxiety, Depression,
Internalizing Symptoms

ABSTRACT

Co-Rumination, Psychological inflexibility, and Internalizing Symptoms in Adolescence

by

John Parigger

Two risk factors for anxiety and depression in adolescence were examined: co-rumination, which occurs when friends excessively talk about problems; and psychological inflexibility, which occurs when one avoids negative feelings and fails to act on values. I hypothesized that psychological inflexibility would exacerbate the effect of co-rumination on adolescent anxiety and depression. Participants were 167 adolescents ($M_{age} = 14.60$ years, $SD = 1.3$; 65.7% cisgender males) who completed standard measures as part of an online survey. Results indicated no moderation effect, but there were main effects of co-rumination and psychological inflexibility on depression symptoms. Co-rumination may relate to higher depression symptoms by reinforcing a focus on stressors. Adolescents exhibiting psychological inflexibility may exacerbate symptoms by avoiding growth opportunities and perseverating on negative emotions. Results call for more research on co-rumination and psychological inflexibility as well as clinical interventions. Limitations include using cross-sectional, self-report methodology.

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Chapter 1. Introduction

Adolescence and Mental Health Difficulties

Adolescence broadly refers to the transition from childhood to adulthood, and it is defined by biological changes as well as cultural expectations (Crone & Dahl, 2012). The start of adolescence is generally agreed upon and closely aligns with the onset of puberty, but the end of adolescence is debated: the WHO defines adolescence as ages 10-19, but some argue ages 10-24 because the brain develops into the mid-20s (Sawyer et al., 2018). While several biopsychosocial changes can make adolescence a challenging time, adolescence can be thought of as a period with potential for both psychosocial growth and challenges (Payne, 2012).

Adolescence is a period of growth in various body systems, which happens at a speed second only to prenatal and infant development (Viner et al., 2015). It is marked by substantial hormonal changes and increased cognitive, emotional, and social processing abilities (Yurgelun-Todd, 2007; Dahl et al., 2018). For example, compared to 9-year-olds, children in middle to late adolescence showed less self-interest in a trust game task, suggesting that adolescents have a greater ability for perspective-taking (Van den Bos et al., 2010). However, aspects of brain development increase the risk for psychosocial difficulties. Neuroimaging studies show developments in brain regions responsible for controlling thoughts and behavior in the pursuit of goals, yet there is higher activity compared to adults in regions that are implicated in immediate rewards and sensation-seeking (Casey et al., 2008; Steinberg, 2008). However, this higher sensitivity to social and affective rewards helps them gain social competence (Crone & Dahl, 2012). This dual-system model posits that coinciding with puberty, social-affective regions develop more quickly than cognitive control regions that do not fully develop until adulthood,

which helps explain higher emotionality, salience of peer relations, and impulsive behavior in adolescence.

Notable mental health risk factors in adolescence are higher emotionality and social changes. Across cross-sectional, longitudinal, and ecological momentary assessment methodologies, adolescents show more frequent experiences of intense positive and negative emotions (Bailen et al., 2019). Emotion dysregulation of anger increases from childhood to adolescence (Zimmerman et al., 2014), and emotion dysregulation is consistently predictive of anxiety and depressive symptoms across self-report studies, with burgeoning evidence in behavioral and neurological studies (Young et al., 2019). In tandem, there tend to be higher expectations for regulating emotions (Klimes-Dougan & Zeman, 2007) and a decrease in parents' restrictions on what their child can do without asking permission (Keijsers & Poulin, 2013). There is also an increase in time spent with peers (Brown & Larson, 2009), and peers become salient influencers, which can be detrimental when adolescents spend time with peers who have internalized distress (Brechwald & Prinstein, 2011; Hogue & Steinberg 1995). Further, there is an increased importance placed on peer evaluations (Schriber & Guyer, 2016). Low levels of peer acceptance relate to social anxiety and may create a cycle of avoiding social interactions and thereby limit opportunities to develop social skills (Kingery et al., 2010). These social difficulties may also contribute to depressive symptoms over time (Lev-Wiesel et al., 2006).

Taken together, these developmental changes create risk for mental health problems. Two of the most common internalizing disorders in adolescence are anxiety and depression (Cummings et al., 2014), with higher rates of anxiety and depression among females compared to males (Martel, 2013). Typical symptoms of anxiety include difficulty controlling worries and feeling restless (Spitzer et al., 2006), and typical symptoms of depression include loss of

enjoyment in daily activities and feeling self-loathing (Angold et al., 1995). Measured by structured interviews, 11% of adolescent females in 2009 had a major depressive episode, and this number climbed to 23% in 2019; additionally, male prevalence rates climbed from 8% to 16% during this time (Daly, 2022). Furthermore, measured by self-report, 42% of adolescent females in 2012 met criteria for anxiety, which increased to 56% in 2018; and rates among males increased from 26% to 31% (Parodi et al., 2022). Overall, the data show concerning rates with an upward trend, warranting a need for further investigation into the mechanisms behind anxiety and depression among adolescents.

Co-Rumination

Co-rumination is an interpersonal process that has received considerable attention in adolescent mental health literature, known as when friends excessively talk about problems and associated negative feelings (Rose, 2002; Stone et al., 2011). It is distinct from rumination, an intrapersonal process that occurs when an individual repetitively focuses on their negative mood state, thinking about possible causes and consequences (Nolen-Hoeksema, 1991). Though rumination and co-rumination are moderately related, factor analyses and discriminant outcomes support each as their own construct (Rose, 2021; Calmes & Roberts, 2008). Another related construct is self-disclosure of personal thoughts and feelings, which is associated with higher relationship quality (Willems et al., 2020). Co-rumination also relates to increased friendship quality (Felton et al., 2019); however, co-rumination differs from self-disclosure because it is excessive and problem-focused (Rose, 2007). When controlling for adolescent report of self-disclosure in a regression model, co-rumination tends to have a weaker link or no link with relationship quality (Rose, 2002; Waller & Rose, 2010). Furthermore, when both co-rumination

and self-disclosure were examined, only co-rumination mediated the relationship between friends' shared internalizing symptoms (Schwartz-Mette & Rose, 2012).

Research indicates that females tend to co-ruminate more than males (Spendelow et al., 2017), which may partially explain the generally higher rates of internalizing symptoms among females compared to males (Rose, 2002; Stone et al., 2011; Felton et al., 2019). Adjustment trade-offs sometimes differ by gender as well: Rose and colleagues found that co-rumination related to higher relationship quality among males and females, but co-rumination related to higher internalizing symptoms among only females over a school year (2007). Also, an observational study showed that co-rumination only related to higher friendship quality among males (Rose et al., 2014). However, other studies found that gender did not moderate the relation between co-rumination and internalizing symptoms (Hankin et al., 2010; Stone et al., 2010). Overall, research is mixed on the moderating effects of gender, but most studies show a gender difference in co-rumination frequency.

Co-Rumination and Adolescent Mental Health

Across various studies with community samples, co-rumination shows relations to depression and anxiety. A longitudinal study utilizing adolescent self-report indicated that co-rumination corresponded with higher symptoms of anxiety and depression (DiGiovanni et al., 2021). Hankin and colleagues (2010) found that adolescent co-rumination showed concurrent links to symptoms of anxiety and depression, and co-rumination predicted increased symptoms over 5 months. Another longitudinal study indicated that adolescent co-rumination predicted a quicker onset of depression, as well as more severe episodes of depression (Stone et al., 2011). Furthermore, monozygotic twin pairs' differences in co-rumination at age 12 predicted increased differences in anxiety symptoms at age 13 such that increased co-rumination related to increased

anxiety, even when controlling for initial friendship quality and anxiety (Dirghangi et al., 2015). However, twin differences in co-rumination did not predict differences in depressive symptoms, and other studies with longitudinal, within-person designs mirror this finding for depressive symptoms (Starr & Davila, 2009) and for anxiety symptoms (Rose et al., 2007).

A meta-analysis found that although co-rumination shows a consistent link to internalizing symptoms, this link is somewhat small, with a mean corrected correlation of .26 for anxiety and .16 for depression (Spendelov et al., 2017). A small effect size is expected since co-rumination does not solely represent a maladaptive process. Aspects of co-rumination can be adaptive and predict increased friendship quality (Felton et al., 2019), and some research has found support for parsing out adaptive and maladaptive subscales of co-rumination (i.e. co-reflecting to understand an issue is adaptive, but co-brooding on unwanted feelings is maladaptive; see Bastin et al., 2014; Starr et al., 2021). Nonetheless, the subscales of co-brooding and co-reflecting had a high correlation ($r = .82$; Bastin et al., 2014) and there is psychometric support for a unidimensional construct of co-rumination (Rose, 2021).

Rather than focusing on co-rumination or components of co-rumination alone, it could be more pertinent to examine individual-level variables that predict *when* co-rumination leads to anxiety and depression. Indeed, research has demonstrated that the effect of co-rumination varies across individuals (DiGiovani et al., 2021). Co-rumination is theorized to predict further internalizing symptoms due to prolonging negative mood states, reinforcement from peers, and increased rumination (Rose, 2021). These mechanisms might be more influential for some adolescents and not as much for others. Perhaps it is not solely about whether co-rumination is occurring but rather how adolescents cope with difficult thoughts, behaviors, and feelings that can arise from co-rumination—which brings us to psychological inflexibility.

Psychological Inflexibility

Psychological inflexibility describes when an individual is more focused on controlling inner psychological experiences (e.g., thoughts, feelings) than they are on taking actions in accordance with their values (Hayes et al., 2006). As one struggles to flexibly respond to unwanted psychological pain, they will often engage in avoidance behaviors that take them away from their life goals, which further increases psychological pain. An adolescent exhibiting psychological inflexibility might avoid social settings to prevent feeling rejected, despite valuing social connection and community, or perhaps over-identify with negative thoughts and emotions about social evaluation. Psychological inflexibility is derived from relational frame theory and Acceptance and Commitment Therapy (ACT), which posits that humans' ability to relate words and stimuli can lead to unwanted associations that provoke psychological pain (e.g., seeing a sunset provokes grief over a lost loved one who enjoyed sunsets; Hayes, 2005). Since unwanted inner experiences are inevitable and attempting to repress them can often make them worse, ACT addresses inflexibility through teaching concepts such as acceptance and mindfulness (Barnes-Holmes et al., 2004). Although most studies have used adult samples, psychological inflexibility is relevant for youth psychosocial adjustment because it is evidenced to be a transdiagnostic process of depression and anxiety (Hayes et al., 2006; Levin et al., 2014; Ciarrochi et al., 2010).

Psychological inflexibility shows incremental and discriminant validity when compared to related constructs such as coping style, thought suppression, neuroticism, and mindfulness (Hayes et al., 2004). While the degree of inflexibility might change depending on context, it is theorized to measure the tendency for an individual to maladaptively respond to negative inner experiences rather than relating to thoughts mindfully and persisting in value-driven behavior (Hayes et al., 2004). Also, a similar term is experiential avoidance, which was used more often in

the initial theoretical framework of ACT, but psychological inflexibility more fully encapsulates changes to the ACT model over time (Bond et al., 2011). Experiential avoidance is currently conceptualized as a component of the overarching construct of psychological inflexibility.

There is substantial evidence in adult samples that psychological inflexibility is linked to both anxiety and depression (Levin et al., 2014), with limited but growing evidence in adolescent samples. A cross-sectional study with an inpatient adolescent sample found that psychological inflexibility mediated the link between neuroticism and depression severity (Paulus et al., 2016). Longitudinal research indicates links between experiential avoidance, an aspect of psychological inflexibility, and depression symptoms (Biglan et al., 2015). Additionally, cross-sectional research indicates that psychological inflexibility was associated with anxiety in adolescent community samples (Lønfeldt et al., 2017). Among undergraduate students, experiential avoidance was related to anxiety symptoms measured each day over three weeks (Kashdan et al., 2006). Accordingly, psychological inflexibility measures are recommended as a screener for anxiety and depression symptoms and have high predictive value (Oppo et al., 2019; Venta et al., 2012).

Psychological Inflexibility as a Moderator

Psychological inflexibility can be characterized as a diathesis for psychopathology (Hayes et al., 2006; Kashdan et al., 2006). Namely, youth who tend to avoid unpleasant feelings may especially be impacted by stressors, which then leads to the development of anxiety or depression. Youth psychological inflexibility is shown to moderate the link between parent illness and adolescent internalizing symptoms (Landi et al., 2021) and between childhood ACEs and adolescent depression symptoms (Hostutler et al., 2023). Also, experiential avoidance moderated the link between the fear of anxiety-related body sensations and anxiety symptoms

among undergraduates (Bardeen et al., 2014). Taken together, there is research to suggest that psychological inflexibility exacerbates the effects of several risk factors for youth mental health. Though it has yet to be examined in relation to co-rumination, this broader literature supports the notion that psychological inflexibility would moderate the effects of co-rumination on adolescent internalizing symptoms.

The ACT model posits several processes that could be relevant during adolescent co-rumination (Hayes et al., 2006; Hayes, 2005). Excessively focusing on the causes of one's problems can represent being fused to thoughts that ultimately take one away from their values. In co-rumination, youth mutually reinforce a focus on problems and negative affect, and this process might be much more impactful for youth who tend to get fused by negative thoughts and feelings. Also, although co-reflecting on problem causes is proposed to be a positive component of co-rumination (Bastin et al., 2014), co-reflection among a psychologically inflexible youth might be akin to being fused to thoughts that stall action towards values. On the other hand, if youth do not exhibit psychological inflexibility, co-rumination might be less impactful and more representative of healthy self-disclosure. In this case, youth might be more likely to “move off” of the negative emotions and problem-focused talk, choosing to continue in goal-directed behavior.

Present Study

Adolescence often has many psychosocial challenges, and this review has focused on the individual risk factors of co-rumination and psychological inflexibility—both of which are associated with anxiety and depression. However, to the best of the author's knowledge, these two concepts have never been examined simultaneously in relation to adolescent internalizing symptoms, and this study aims to address this gap. Co-rumination has a consistent but somewhat

weak link with internalizing symptoms, and it is evidenced to affect some individuals more than others, which calls for more research on potential explanations. The present study proposes that adolescents' level of psychological inflexibility will impact the link between co-rumination and internalizing symptoms.

Hypotheses are as follows: (H1a) co-rumination will directly positively relate to anxiety symptoms, (H1b) and this link will be moderated by psychological inflexibility; (H2a) co-rumination will directly positively relate to depression symptoms, (H2b) and this link will be moderated by psychological inflexibility. Specifically, it is hypothesized that when psychological inflexibility is higher, there will be a stronger positive effect of co-rumination on anxiety and depression.

Chapter 2. Methods

Participants

Participants were 167 caregiver-adolescent pairs. Adolescents ranged from 13-17 years old ($M = 14.56$, $SD = 1.34$, 33.7% cisgender female, 65.7% cisgender male, and .6% transgender male). One caregiver and one adolescent participated for each family. Caregivers were 59% biological fathers, 30.7% biological mothers, 2.4% adoptive mothers, 1.8% stepfathers, 1.2% grandmothers, and 0.6% stepmothers, and 4.2% other caregivers. As for race/ethnicity, 73.5% of adolescents identified as European American, 6.6% as American Indian, 4.8% as Hispanic or Latino, 4.2% as Asian American, 1.8% as African American, 1.2% as Native Hawaiian or Pacific Islander, and 7.8% identified with other racial/ethnic groups. Many caregivers were highly educated, with 47.3% indicating a college degree, 40% a graduate degree, 6.1% some college, 5.5% with a high school diploma, and 1.2% some high school.

Procedures

Data were collected in the United States in February of 2021. Participants were recruited via Qualtrics. To participate, the caregiver had to be 18 years or older, and the teen between the age of 13-17. The caregiver provided informed consent for themselves and their teen, and the teen provided informed assent. If a caregiver indicated they had more than one teen, they were told to select one of their teens based on their choice. Participants then answered demographic questions and questions regarding the study variables of interest. Participants could select from a range of gender identities and races/ethnicities (see Appendix A). At the end of the study, participants received Qualtrics points. These points could then be used towards a reward of their choice. Some examples of rewards are hats, stickers, pens, and gift cards. All study procedures were approved by the University IRB.

Measures

Co-Rumination

Adolescents completed the co-rumination questionnaire (CRQ; Rose 2002). Respondents are instructed to think of a close friend and rate agreement to 27 statements such as “*We spend most of our time together talking about problems that my friend or I have*” (see Appendix B). Responses are coded from 1 (*Not At All True*) to 5 (*Completely True*). Items are summed, with a higher total score indicating a higher amount of co-rumination. The CRQ was developed for adolescents and had high internal reliability in the initial study (Cronbach $\alpha = .96$; Rose 2002). Validity and reliability have been consistent in further administrations for community samples (Cronbach $\alpha = .97$; Rose et al., 2007). Reliability was adequate for the present study (Cronbach $\alpha = .96$).

Psychological Inflexibility

Adolescents answered questions for the 9-item Acceptance and Action Questionnaire (AAQ; Hayes et al., 2004). Adolescents answered the extent to which they thought each statement was true (coded from 1 = *Never True*, to 7 = *Always True*). Higher scores represent higher inflexibility. Items such as “*Anxiety is bad*” are added with items that are reverse scored such as “*I’m not afraid of my feelings*” (see Appendix C). The total score is then used for analyses. The AAQ was initially validated across clinical, emerging adulthood, and adult samples (average Cronbach $\alpha = .70$; Hayes et al., 2004). Though this measure was originally normed for adults, it showed high internal consistency in our adolescent sample (Cronbach $\alpha = .89$).

Anxiety

Adolescents completed the Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006). Adolescents reported the frequency of anxiety symptoms in the past 2 weeks such as “*Worrying too much about different things*” (see Appendix D). Adolescents ranked each statement from 0 = *Not at all*, to 3 = *Nearly Every Day*. Total scores are used, and higher scores indicate more severe anxiety symptoms (0-4 = minimal, 5-9 = mild, 10-14 = moderate, 15-21 = severe). In the present study, 44.2% of the sample had a score of 10 or higher. The GAD-7 showed good internal consistency (Cronbach $\alpha = .92$) in the initial validation among adults 18-95 years old (Spitzer et al., 2006). It has been validated among adolescent samples and showed adequate specificity and sensitivity (Mossman et al., 2017). It shows high internal consistency in our sample (Cronbach $\alpha = .92$).

Depression

Adolescents completed the Short Mood and Feelings Questionnaire (SMFQ; Angold et al., 1995). This measure consists of 13 items that are answered with a Likert scale (1 = *Not True*, 2 = *Sometimes True*, 3 = *True*). Participants are instructed to think of how they have felt in the past two weeks for items such as “*I didn’t enjoy anything at all*” (see Appendix E). All items are added together to create a sum, and higher scores indicate more severe depression symptoms. In the present study, 53.6% of the sample had a score of 11 or higher, which is a recommended cutoff score that indicates a diagnosis of depression is likely (Turner et al., 2014). The SMFQ was first validated among children aged 6-17, and it had high criterion validity compared to other depression self-report measures and a clinical interview (Angold et al., 1995). The first validation study showed high internal consistency (Cronbach $\alpha = .85$), and these results are similar to our sample (Cronbach $\alpha = .94$).

Chapter 3. Results

Data Cleaning and Preliminary Analyses

The sample had 167 adolescents, 156 of which had complete data for the variables of interest. Since this was a small number of missing values, I excluded cases listwise. This is a common approach, which protects against type 1 error and is unlikely to bias the results when only a few cases are missing (Allison, 2009; Altman & Bland, 2007). Furthermore, participant data was excluded if the standard deviation of their responses to the 27-item co-rumination questionnaire was zero, which is indicative of careless responding via straightlining (Kim et al., 2019). 16 participants were excluded due to straightlining.

I had planned to test for the covariate of race/ethnicity; however, sample sizes of race/ethnicity categories were too small to test for group differences (other than European American, categories each had less than or equal to 10 participants). Also, there was only one transgender male who participated in the study, so I was only able to analyze gender differences among cisgender males and cisgender females. I conducted 4 independent samples T-tests for gender, and I found significance for the measures of co-rumination and psychological inflexibility. Cisgender male participants had a higher mean co-rumination score ($M = 98.24$, $SD = 20.21$), compared to cisgender female participants ($M = 90.24$, $SD = 23.60$), $t(136) = 2.07$, $p = .040$). Also, with equal variances not assumed due to a significant value for Levene's test ($p = .006$), cisgender male participants had a higher mean psychological inflexibility score ($M = 41.05$, $SD = 11.52$), compared to cisgender female participants ($M = 37.52$, $SD = 8.46$), $t(117) = 2.04$, $p = .044$). Accordingly, I included gender as a covariate in hypothesis-testing, and one more participant was excluded because they did not answer demographic questions, resulting in a final sample size of 138 participants.

Correlations and descriptive statistics are depicted in Table 1. All skewness and kurtosis values were within acceptable cutoffs for assumptions of normality. There was no evidence for collinearity between psychological inflexibility and co-rumination (VIF = 1.65). However, measures of anxiety and depression were highly correlated. As such, I conducted a supplementary analysis using a combined score, after hypothesis-testing.

Table 1

Correlations and Descriptives of Study Variables

	1	2	3	4	<i>M</i>	<i>SD</i>	Skew	Kurtosis
1. CRQ	1				95.57	21.65	-.77	.31
2. AAQ	.63*	1			39.88	10.70	.16	-.21
3. GAD-7	.35*	.30*	1		8.72	6.02	-1.00	-1.25
4. SMFQ	.40*	.40*	.80*	1	10.70	7.95	-.03	-1.34

Note. AAQ = Acceptance and Action Questionnaire, CRQ = Co-Rumination Questionnaire, GAD-7 = Generalized Anxiety Disorder-7, SMFQ = Short Mood and Feelings Questionnaire.

* $p < .01$

Moderation Analyses

I conducted moderation analyses in SPSS using Hayes' guidelines for PROCESS macro v.4.2 (2017). I used 5,000 bootstrap samples to create bias-corrected 95% confidence intervals for each of the effects. Post-hoc power analysis via G*power 3.1 (Faul et al., 2009) indicated that the proposed model was adequately powered to detect large and medium effects. Gender was set as a covariate in all moderation analyses. All study variables (co-rumination, psychological inflexibility, anxiety, depression) were entered as z-scores.

To test Hypothesis 1, I set co-rumination as the predictor variable, psychological inflexibility as the moderator, and anxiety as the outcome variable (Conceptual model depicted

in Figure 1). The overall model was significant ($F(4, 133) = 5.97, p = .001$) and accounted for 15.22% of the variance in anxiety symptoms. Although there was a trend for a moderation effect as indicated by only negative values in the confidence interval (results depicted in Table 2), there was no significant effect for any of the predictor variables in the model.

Figure 1

Model for Predicting Anxiety Symptoms

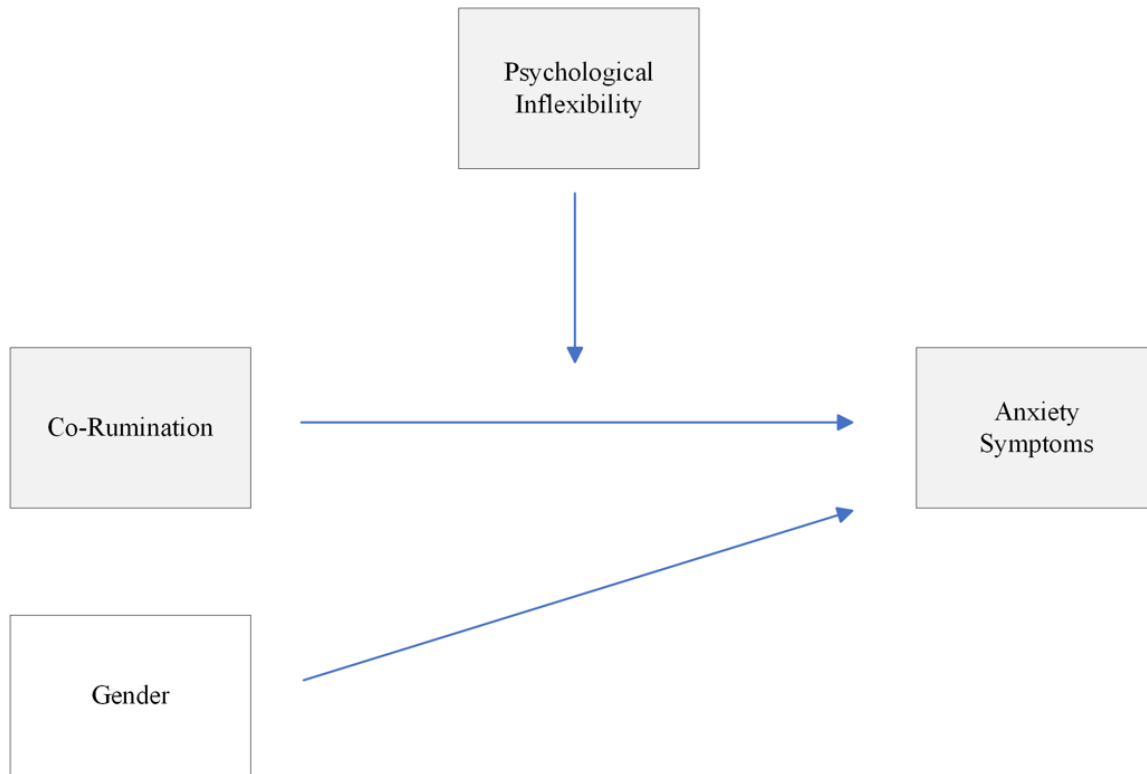


Table 2

Regression Model of Co-Rumination and Psychological Flexibility on Anxiety Symptoms

	β	SE	p	CI
Constant	.08	.11	.46	[-.12, .30]
Gender	-.01	.17	.99	[-.32, .31]
CRQ	.19	.11	.10	[-.02, .40]
AAQ	.19	.11	.08	[-.05, .38]
CRQ \times AAQ	-.13	.07	.07	[-.28, -.02]

Note. CRQ = Co-Rumination Questionnaire, AAQ = Acceptance and Action Questionnaire

To test Hypothesis 2, I set co-rumination as the predictor variable, psychological inflexibility as the moderator, and depression as the outcome variable. (conceptual model depicted in Figure 1). The overall model was significant ($F(4, 133) = 8.49, p \leq .000$) and accounted for 20.34% of the variance in anxiety symptoms. There was no effect for gender, and there were main effects for both co-rumination and psychological inflexibility. Co-rumination and psychological inflexibility each related to higher self-reported adolescent depressive symptoms. There was no interaction effect, indicating that moderation was not present. Results are depicted in Table 3.

Figure 2

Model for Predicting Depression Symptoms

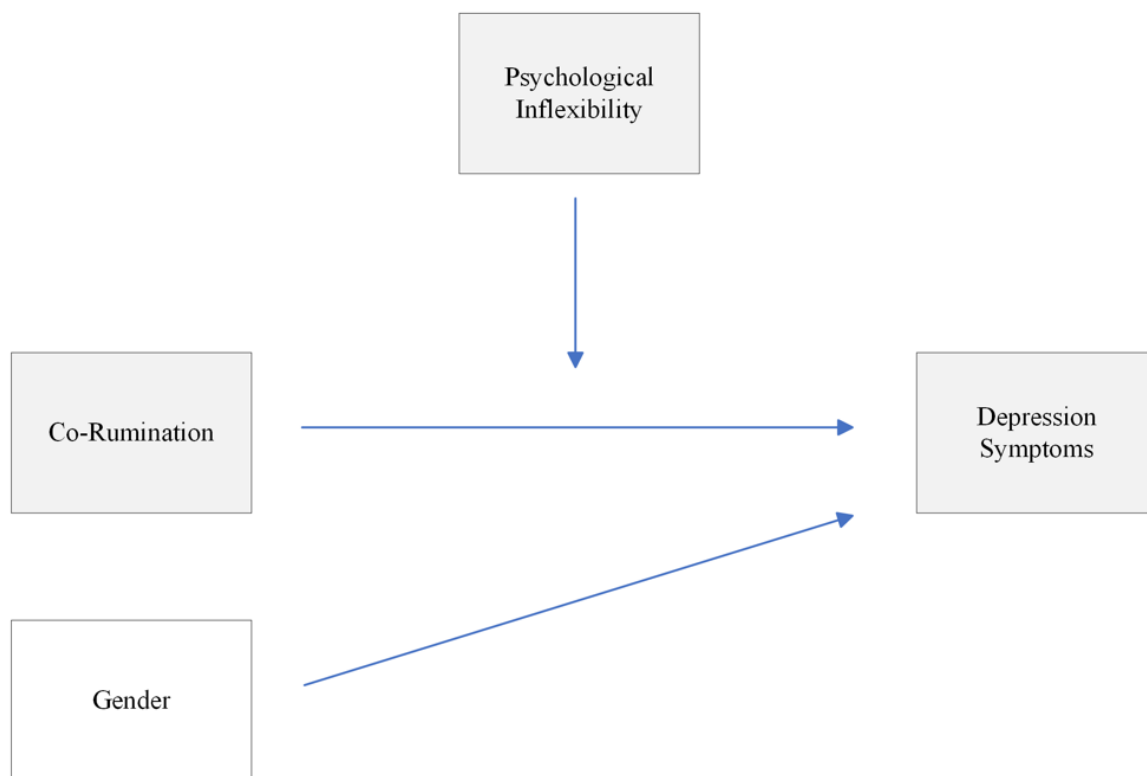


Table 3*Regression Model of Co-Rumination and Psychological Flexibility on Depression Symptoms*

	β	SE	p	CI
Constant	-.02	.11	.89	[-.20, .18]
Gender	.14	.17	.42	[-.19, .46]
CRQ	.23	.11	.036	[.02, .44]
AAQ	.27	.10	.011	[.06, .46]
CRQ \times AAQ	-.05	.07	.44	[-.19, .06]

Note. CRQ = Co-Rumination Questionnaire, AAQ = Acceptance and Action Questionnaire

Given the high correlation between anxiety and depression symptoms, I conducted a supplementary analysis with internalizing symptoms as the outcome variable, for which I averaged scores on the anxiety and depression measures (conceptual model depicted in Figure 3). The internalizing symptom score was approximately normal (skewness = -.15, kurtosis = -1.34, $M = 16.21$, $SD = 6.64$). The overall model was significant ($F(4, 133) = 8.06$, $p = .000$) and accounted for 19.50% of the variance in internalizing symptoms. There was no effect for gender and no interaction effect, indicating that moderation was not present. There were direct main effects for co-rumination and psychological inflexibility, both of which related to higher self-reported internalizing symptoms. Results are displayed in Table 4.

Figure 3

Model for Predicting Internalizing Symptoms

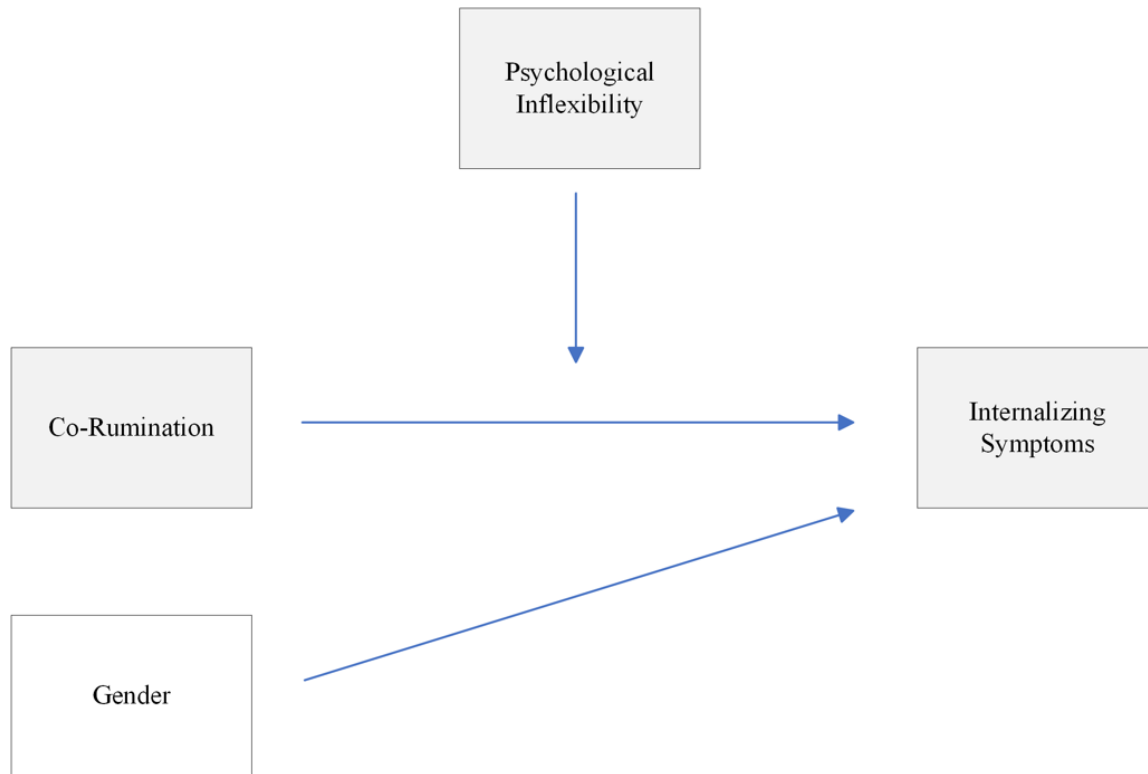


Table 4

Regression Model of Co-Rumination and Psychological Flexibility on Internalizing Symptoms

	β	SE	p	CI
Constant	.03	.11	.80	[-.17, .23]
gender	.08	.17	.63	[-.23, .39]
CRQ	.22	.11	.044	[.01, .43]
AAQ	.24	.10	.020	[.03, .45]
CRQ \times AAQ	-.09	.07	.20	[-.24, .02]

Note. CRQ = Co-Rumination Questionnaire, AAQ = Acceptance and Action Questionnaire

Chapter 4. Discussion

The present study examined whether adolescent co-rumination related to anxiety and depression symptoms and if psychological inflexibility moderated these links. Although there was no evidence for moderation and no independent effects on anxiety symptoms, there were independent, direct effects on depression symptoms for both co-rumination and psychological inflexibility.

Effects on Anxiety and Depression Symptoms

Controlling for the effects of gender, I did not find support for the hypothesis (H1a) that co-rumination would relate to adolescent anxiety. This result is contrary to the idea that co-rumination might reinforce anxious thought patterns as well as induce anxiety about the outcomes of a friend's personal problems (Dirghangi et al., 2015). However, I specifically found that co-rumination did not correspond with more anxiety when psychological inflexibility was accounted for in the model. As prior research has not examined co-rumination and psychological inflexibility in tandem, perhaps co-rumination and psychological inflexibility do not uniquely relate to anxiety when their shared variance is accounted for. Supporting this assertion, the two variables were moderately correlated in our sample ($r = .63$), and when looking only at zero-order correlations, the present study found that co-rumination had similar effect sizes on anxiety symptoms ($r = .35$) and depression symptoms ($r = .40$). Additionally, there is support for characterizing co-rumination as a facet or manifestation of psychological inflexibility (Starr et al., 2021). A psychologically inflexible adolescent may be more likely to avoid acting on values by co-ruminating with a friend. For anxiety symptoms, co-rumination may have a limited unique effect when accounting for psychological inflexibility.

For depression symptoms, I found evidence for the hypothesis (H2a) that co-rumination would relate to higher depression symptoms. The problem-focused talk that occurs in co-rumination might reinforce negative affect and encourage more rumination (Rose, 2021). Co-rumination related to higher depression symptoms when psychological inflexibility was accounted for in the model. Although psychological inflexibility is theorized to be an underlying cognitive-behavioral pattern that explains psychopathology such as depression (Hayes et al., 2006; Kashdan et al., 2006), its effect size was similar to co-rumination. These results align with findings on the importance of social interactions in adolescence (Brown & Larson, 2009), and the potential for peers to reinforce maladaptive cognitions and behavior (Brechwald & Prinstein, 2011).

Perhaps co-rumination relates to depression symptoms through a different mechanism than psychological inflexibility, but it is surprising that co-rumination had a unique effect on depression but not on anxiety. As far as average effect size, co-rumination sometimes shows no relation to depression symptoms (Starr & Davila, 2009; Dirghangi et al., 2015), and co-rumination might be more strongly related to adolescent anxiety symptoms than depression symptoms (DiGiovanni et al., 2021; Spendelow et al., 2017). Results may have been spurious because the present study effect size for co-rumination on depression was small according to guidelines for interpreting coefficient beta (Cohen, 1998). Although there was sufficient power for medium and large effect sizes, the study was inadequately powered for small effects. Perhaps limited power and unmeasured aspects of our sample led to only finding support for co-rumination being related to depression symptoms. Data was collected during COVID-19, and this impactful external stressor might have influenced results by increasing average levels of co-rumination that in turn related to internalizing symptoms. Indeed, the correlation between co-

rumination and depression and the correlation between co-rumination and anxiety were both higher than the mean corrected correlations reported in a recent meta-analysis (Spendelov et al., 2017). Moreover, participants' average scores on anxiety and depression measures were near cut-off recommendations for further valuation, which is high for a community sample.

Though not hypothesized, when co-rumination and psychological inflexibility were entered simultaneously in the regression model, psychological inflexibility was related to higher depression symptoms but not anxiety symptoms. A core aspect of psychological inflexibility is the avoidance of unwanted thoughts and emotions (Ruiz, 2010). Psychologically inflexible adolescents may develop depression symptoms by making choices contrary to their values, which increases negative affect and creates a maladaptive cycle, resulting in increased depression symptoms (Ruiz, 2010). However, psychological inflexibility did not uniquely relate to anxiety symptoms. This is surprising given that psychologically inflexible adolescents would be expected to avoid psychosocial challenges and changes, leading to increased anxiety. There may be differences in the mechanisms behind how psychological inflexibility impacts anxiety versus depression symptoms, but very few studies have examined these variables simultaneously, so replication and further research are needed. Similar to the findings for co-rumination, the effect size of psychological inflexibility on depression was small. Again, sample characteristics and sample size might have led to a failure to detect unique effects for both anxiety and depression.

Potential Explanations for Finding No Moderation

I did not find support for the hypotheses that psychological inflexibility would moderate the effect of co-rumination on anxiety symptoms (H1b) and that psychological inflexibility would moderate the effect of co-rumination on depression symptoms (H2b). I anticipated that

psychologically inflexible adolescents would be more impacted by co-rumination since they might more readily engage in rumination and avoidance; however, co-rumination related to adolescents' anxiety and depression symptoms regardless of their level of self-reported psychological inflexibility.

As for why these moderation effects were not present, aspects of psychological inflexibility might have contributed to null findings. Psychological inflexibility is a broad construct that includes experiential avoidance of feelings and struggling to act in accordance with values. Some values may be harder to act on if an adolescent's parents have opposing values, and adolescence is a stage of identity development and change (Kroger, 2006), so values may be less well-defined. The conceptualization of psychological inflexibility is heavily tied to values, so its effects may be harder to detect among adolescents. Perhaps the effect of co-rumination on internalizing symptoms is moderated by more specific aspects coping patterns than psychological inflexibility, such as cognitive reappraisal of stressors. Additionally, there might be bidirectional associations between co-rumination and psychological inflexibility, which would not have been accounted for in the tested model. Though the constructs are distinct, they were moderately correlated in our sample. Since adolescents who co-ruminated more typically had higher psychological inflexibility, moderation effects would be hard to detect.

Measurement concerns also may have contributed to null findings. The psychological inflexibility scale we used was based on older models and initially designed for adults, whereas other measures encapsulate changes to the model and are designed for youth (e.g., the Avoidance and Fusion Questionnaire for Youth; Livheim et al., 2016). Moreover, co-rumination was operationalized as a unidimensional construct in the present study, but recent research has found support for separating co-rumination into the two factors of co-reflecting and co-brooding

(Bastin et al., 2014), and perhaps only one of these factors would be moderated by psychological inflexibility. There may be important differences in these factors, as co-brooding on negative feelings is related to depression symptoms, but co-reflecting to gain insight into problems is inversely related (Bastin et al., 2017).

Additional Findings and Supplementary Analyses

Ancillary findings add to the present study's contribution to the literature. There was an unexpected group difference of females having a significantly lower amount of co-rumination than males, while many studies show females having higher co-rumination (Spendelov et al., 2017). Co-rumination is thought to be partially responsible for why females tend to have more internalizing symptoms than males (Rose, 2002). Our results suggest limitations to this theory; however, finding contrary relations might have been due to a small sample size. Furthermore, anxiety and depression symptoms were highly correlated ($r = .80$). Although there are high rates of comorbidity, average differences in developmental trajectories support characterizing the symptom clusters as distinct (Cummings et al., 2014). Nonetheless, the results supported a broader concept of internalizing symptoms; accordingly, I conducted a supplementary analysis with a combined internalizing symptoms score. I found no moderation effect, and co-rumination and psychological inflexibility each had direct effects on internalizing symptoms. Results of the supplementary analysis support arguments for subsuming anxiety and depression under a higher order factor of internalizing symptoms, while the initial analyses demonstrate the nuanced findings that can be discovered when examining anxiety and depression separately.

Strengths, Limitations, and Future Directions

The present study adds to the literature as the first exploration of potential interactive effects of adolescent co-rumination and psychological inflexibility on adolescent internalizing

symptoms. Patterns of relations suggest that rather than moderating effects, psychological inflexibility and co-rumination demonstrate unique effects on youth outcomes. Moreover, findings support the notion that co-rumination is an impactful dyadic process for youth mental health, calling for more research into interventions to mitigate the negative effects of co-rumination. Psychological inflexibility also showed associations with depression symptoms, which adds to the limited research on the outcomes of psychological inflexibility among adolescents. Results support the promise of ACT interventions for adolescents as well as support efforts to address the gap in validating aspects of ACT among adolescents (Halliburton & Cooper, 2015).

Along with strengths, there are some limitations in study design and generalizability. The study was only sufficiently powered for medium and large effects, and although valid measures for constructs were used, there are limitations in using self-report data only. We also cannot conclude causality due to having a cross-sectional design. There is limited generalizability, as our sample was collected at the start of COVID19, was predominately European American, and most caregivers were highly educated. I was unable to account for potential contextual variables from culture and life circumstances. For example, youth facing stress from adverse childhood experiences, discrimination, and/or peer exclusion could have more potential stressors to co-ruminate about. Further, we did not account for potential effects from having approximately twice as many fathers as mothers who enrolled in the study, which may indicate higher father-involvement in parenting. In parent and youth research, it is more common for mothers to be involved. For example, a meta-analysis found that father-related outcome data was not collected in 87% of studies on behavioral parent training for ADHD (Fabiano, 2007). Taken together, future research could consider employing longitudinal and experimental designs, accounting for

more contextual variables, and examining the present study constructs among other populations and cultures.

Since we found that males had higher average levels of co-rumination, and there are mixed results on how gender influences co-rumination's effects, future studies might further examine potential reasons for gender effects. The males in our study might have different experiences and exhibit different behaviors than average male adolescents in past studies. Rose posits that females co-ruminate more on average because compared to males, females spend more time in dyads and tend to ruminate more (2002). Also, parents tend to talk about emotions less with sons than daughters (Denham et al., 2010), which may impact how willing an adolescent is to co-ruminate with friends. Perhaps differences in friendship dynamics and parent emotion socialization would explain when co-rumination increases more reliably than looking at average gender differences. Additionally, we found that co-rumination had an approximately equal correlation with anxiety and depression, but future research might more directly examine what conditions influence whether co-rumination correlates to more anxiety versus more depression symptoms. There might be other individual characteristics, contexts, and coping styles that influence the relationship between co-rumination and internalizing symptoms.

Future studies could also more closely examine the components of the broad constructs we examined (i.e., co-brooding and co-reflecting, and the 6 components of psychological inflexibility) and whether they have unique associations. Co-brooding and co-reflecting might serve different functions and represent stages of behavioral change much like precontemplation and contemplation in motivational interviewing (DiClemente & Velasquez, 2002). In addition, other models could be tested that integrate theoretical perspectives and account for bidirectional

relations. Accordingly, future studies might achieve results that tell a more nuanced story than the present study.

Conclusion

Overall, the present study demonstrates that adolescent co-rumination and psychological inflexibility have independent, direct relations to depression but not to anxiety. Findings support research on clinical applications for addressing these risk factors. We found no evidence for psychological inflexibility moderating the effects of co-rumination, which suggests that other constructs may be more relevant for the differential effects of co-rumination. The present study adds to the extant literature on how co-rumination relates to internalizing symptoms during adolescence.

References

- Allison, P. D. (2009). Missing data. In R. E. Millsap & A. Maydeu-Olivares (Eds.), *The Sage handbook of quantitative methods in psychology* (pp. 72–89). Sage Publications Ltd. <https://doi.org/10.4135/9780857020994.n4>
- Altman, D. G., & Bland, J. M. (2007). Missing data. *BMJ (Clinical research ed.)*, *334*(7590), 424. <https://doi.org/10.1136/bmj.38977.682025.2C>
- Angold, A., Costello, E. J., Messer, S. C., & Pickles, A. (1995). Development of a short questionnaire for use in epidemiological studies of depression in children and adolescents. *International Journal of Methods in Psychiatric Research*, *5*(4), 237–249.
- Bailen, N. H., Green, L. M., & Thompson, R. J. (2019). Understanding emotion in adolescents: A review of emotional frequency, intensity, instability, and clarity. *Emotion Review*, *11*(1), 63–73. <https://doi.org/10.1177/1754073918768878>
- Barnes-Holmes, Y., Barnes-Holmes, D., McHugh, L., & Hayes, S. C. (2004). Relational frame theory: Some implications for understanding and treating human psychopathology. *International Journal of Psychology and Psychological Therapy*, *4*(2), 355-375.
- Bardeen, J., Fergus, T., & Orcutt, H. (2014). The moderating role of experiential avoidance in the prospective relationship between anxiety sensitivity and anxiety. *Cognitive Therapy & Research* *38*(4), 465–471. <https://doi.org/10.1007/s10608-014-9614-z>
- Bastin, M., Bijttebier, P., Raes, F., & Vasey, M. W. (2014). Brooding and reflecting in an interpersonal context. *Personality and Individual Differences*, *63*, 100-105. <https://doi.org/10.1016/j.paid.2014.01.062>
- Bastin, M., Vanhalst, J., Raes, F., & Bijttebier, P. (2017). Co-brooding and co-reflection as differential predictors of depressive symptoms and friendship quality in adolescents:

Investigating the moderating role of gender. *Journal of Youth and Adolescence*.
doi:10.1007/s10964-017-0746-9

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., Waltz, T., & Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire–II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*, *42*(4), 676-688.

Brechwald, W. A., & Prinstein, M. J. (2011). Beyond homophily: A decade of advances in understanding peer influence processes. *Journal of Research on Adolescence*, *21*(1), 166–179. <https://doi.org/10.1111/j.1532-7795.2010.00721.x>

Brown, B. B., & Larson, J. (2009). Peer relationships in adolescence. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology: Contextual influences on adolescent development* (3rd ed., pp. 74-103). John Wiley & Sons, Inc.
<https://doi.org/10.1002/9780470479193.adlpsy002004>

Calmes, C. A., & Roberts, J. E. (2008). Rumination in interpersonal relationships: Does Co-rumination explain gender differences in emotional distress and relationship satisfaction among college students? *Cognitive Therapy and Research*, *32*(4), 577-590.
<https://doi.org/10.1007/s10608-008-9200-3>

Casey, B. J., Getz, S., & Galvan, A. (2008). The adolescent brain. *Developmental Review: DR*, *28*(1), 62-77. <https://doi.org/10.1016/j.dr.2007.08.003>

Ciarrochi, J., Bilich, L., & Godsell, C. (2010). Psychological flexibility as a mechanism of change in acceptance and commitment therapy. In R. A. Baer (Ed.), *Assessing mindfulness and acceptance processes in clients: Illuminating the theory and practice of change* (pp. 51–75). Context Press/New Harbinger Publications.

- Crone, E. A., & Dahl, R. E. (2012). Understanding adolescence as a period of social-affective engagement and goal flexibility. *Nature Reviews Neuroscience*, *13*, 636-650.
<http://dx.doi.org/10.1038/nrn3313>
- Cummings, C. M., Caporino, N. E., & Kendall, P. C. (2014). Comorbidity of anxiety and depression in children and adolescents: 20 years after. *Psychological Bulletin*, *140*(3), 816–845. <https://doi.org/10.1037/a0034733>
- Dahl, R. E., Allen, N. B., Wilbrecht, L., & Suleiman, A. B. (2018). Importance of investing in adolescence from a developmental science perspective. *Nature*, *554*(7693), 441–450.
<https://doi.org/10.1038/nature25770>
- Daly M. (2022). Prevalence of depression among adolescents in the U.S. from 2009 to 2019: Analysis of trends by sex, race/ethnicity, and income. *The Journal of Adolescent Health*, *70*(3), 496–499. <https://doi.org/10.1016/j.jadohealth.2021.08.026>
- Denham, S. A., Bassett, H. H., & Wyatt, T. M. (2010). Gender differences in the socialization of preschoolers' emotional competence. *New Directions For Child and Adolescent Development*, (128), 29–49. <https://doi.org/10.1002/cd.267>
- DiClemente, C. C., & Velasquez, M. M. (2002). Motivational interviewing and the stages of change. *Motivational interviewing: Preparing people for change*, *2*, 201-216.
- Dirghangi, S., Kahn, G., Laursen, B., Brendgen, M., Vitaro, F., Dionne, G., & Boivin, M. (2015). Co-rumination cultivates anxiety: A genetically informed study of friend influence during early adolescence. *Developmental Psychology*, *51*(4), 564-571.
<https://doi.org/10.1037/a0038848>
- Felton, J. W., Cole, D. A., Havewala, M., Kurdziel, G., & Brown, V. (2019). Talking together, thinking alone: relations among co-rumination, peer relationships, and rumination.

- Journal of Youth and Adolescence*, 48(4), 731–743. <https://doi.org/10.1007/s10964-018-0937-z>.
- Halliburton, A. E., & Cooper, L. D. (2015). Applications and adaptations of Acceptance and Commitment Therapy (ACT) for adolescents. *Journal of Contextual Behavioral Science*, 4(1), 1–11. <https://doi.org/10.1016/j.jcbs.2015.01.002>
- Hankin, B. L., Stone, L., & Wright, P. A. (2010). Corumination, interpersonal stress generation, and internalizing symptoms: accumulating effects and transactional influences in a multiwave study of adolescents. *Development and Psychopathology*, 22(1), 217-235. <https://doi.org/10.1017/S0954579409990368>
- Hayes, S. C. (2005). Get out of your mind and into your life: The new acceptance and commitment therapy. New Harbinger Publications.
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: model, processes and outcomes. *Behaviour Research and Therapy*, 44(1), 1-25. <https://doi.org/10.1016/j.brat.2005.06.006>
- Hayes, S. C., Strosahl, K., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., Polusny, M. A., Dykstra, T. A., Batten, S. V., Bergan, J., Stewart, S. H., Zvolensky, M. J., Eifert, G. H., Bond, F. W., Forsyth, J. P., Karekla, M., & McCurry, S. M. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record*, 54(4), 553–578. <https://doi.org/10.1007/BF03395492>
- Hogue, A., & Steinberg, L. (1995). Homophily of internalized distress in adolescent peer groups. *Developmental Psychology*, 31(6), 897–906. <https://doi.org/10.1037/0012-1649.31.6.897>

- Hostutler, C. A., Snider, T., Wolf, N., & Grant, R. (2023). ACEs screening in adolescent primary care: Psychological flexibility as a moderator. *Families, Systems, & Health, 41*(2), 182. <https://doi.org/10.1037/fsh0000717>
- Kashdan, T. B., Barrios, V., Forsyth, J. P., & Steger, M. F. (2006). Experiential avoidance as a generalized psychological vulnerability: comparisons with coping and emotion regulation strategies. *Behaviour Research and Therapy, 44*(9), 1301-1320. <https://doi.org/10.1016/j.brat.2005.10.003>
- Keijsers, L., & Poulin, F. (2013). Developmental changes in parent-child communication throughout adolescence. *Developmental Psychology, 49*(12), 2301–2308. <https://doi.org/10.1037/a0032217>
- Kingery, J. N., Erdley, C. A., Marshall, K. C., Whitaker, K. G., & Reuter, T. R. (2010). Peer experiences of anxious and socially withdrawn youth: an integrative review of the developmental and clinical literature. *Clinical Child and Family Psychology Review, 13*(1), 91–128. <https://doi.org/10.1007/s10567-009-0063-2>
- Kim, Y., Dykema, J., Stevenson, J., Black, P., & Moberg, D. P. (2019). Straightlining: Overview of measurement, comparison of indicators, and effects in mail-web mixed-mode surveys. *Social Science Computer Review, 37*(2), 214–233. <https://doi.org/10.1177/0894439317752406>.
- Klimes-Dougan, B., & Zeman, J. (2007). Introduction to the special issue of social development: Emotion socialization in childhood and adolescence [Editorial]. *Social Development, 16*(2), 203-209. <https://doi.org/10.1111/j.1467-9507.2007.00380.x>
- Kroger, J. (2006). Identity development during adolescence. In G. R. Adams & M. D. Berzonsky (Eds.), *Blackwell handbook of adolescence* (pp. 205–226). Wiley-Blackwell.

- Landi, G., Pakenham, K. I., Benassi, M., Giovagnoli, S., Tossani, E., & Grandi, S. (2021). A Model of the effects of parental illness on youth adjustment and family functioning: The moderating effects of psychological flexibility on youth caregiving and stress. *International Journal of Environmental Research and Public Health*, *18*(9), 4902. <https://doi.org/10.3390/ijerph18094902>
- Levin, M. E., MacLane, C., Daflos, S., Seeley, J., Hayes, S. C., Biglan, A., & Pistorello, J. (2014). Examining psychological inflexibility as a transdiagnostic process across psychological disorders. *Journal of Contextual Behavioral Science*, *3*(3), 155-163. <https://doi.org/10.1016/j.jcbs.2014.06.003>
- Lev-Wiesel, R., Nuttman-Shwartz, O., & Sternberg, R. (2006). Peer rejection during adolescence: Psychological long-term effects--A brief report. *Journal of Loss and Trauma*, *11*(2), 131-142. <https://doi.org/10.1080/15325020500409200>
- Livheim, F., Tengström, A., Bond, F. W., Andersson, G., Dahl, J., & Rosendahl, I. (2016). Psychometric properties of the Avoidance and Fusion Questionnaire for Youth: A psychological measure of psychological inflexibility in youth. *Journal of Contextual Behavioral Science*, *5*(2), 103–110. <https://doi.org/10.1016/j.jcbs.2016.04.001>
- Lønfeldt, N. N., Silverman, W. K., & Esbjørn, B. H. (2017). A systematic review and meta-analysis of the association between third-wave cognitive constructs and youth anxiety. *International Journal of Cognitive Therapy*, *10*(2), 115-137. <https://doi.org/10.1521/ijct.2017.10.2.115>
- Martel, M. M. (2013). Sexual selection and sex differences in the prevalence of childhood externalizing and adolescent internalizing disorders. *Psychological Bulletin*, *139*(6), 1221–1259. <https://doi.org/10.1037/a0032247>

- Mossman, S. A., Luft, M. J., Schroeder, H. K., Varney, S. T., Fleck, D. E., Barzman, D. H., Gilman, R., DelBello, M. P., & Strawn, J. R. (2017). The Generalized Anxiety Disorder 7-item scale in adolescents with generalized anxiety disorder: Signal detection and validation. *Annals of Clinical Psychiatry, 29*(4), 227–234A.
- Nolen-Hoeksema S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100*(4), 569-582.
<https://doi.org/10.1037//0021-843x.100.4.569>
- Oppo, A., Schweiger, M., Ristallo, A., Presti, G., Pergolizzi, F., & Moderato, P. (2019). Mindfulness skills and psychological inflexibility: Two useful tools for a clinical assessment for adolescents with internalizing behaviors. *Journal of Child and Family Studies, 28*(12), 3569-3580.
- Parodi, K. B., Holt, M. K., Green, J. G., Porche, M. V., Koenig, B., & Xuan, Z. (2022). Time trends and disparities in anxiety among adolescents, 2012-2018. *Social Psychiatry and Psychiatric Epidemiology, 57*(1), 127-137. <https://doi.org/10.1007/s00127-021-02122-9>
- Paulus, D. J., Vanwoerden, S., Norton, P. J., & Sharp, C. (2016). Emotion dysregulation, psychological inflexibility, and shame as explanatory factors between neuroticism and depression. *Journal of Affective Disorders, 190*, 376-385.
<https://doi.org/10.1016/j.jad.2015.10.014>
- Payne, M. A. (2012). “All gas and no brakes!” Helpful metaphor or harmful stereotype? *Journal of Adolescent Research, 27*(1), 3-17. <https://doi.org/10.1177/0743558411412956>
- Rose A. J. (2002). Co-rumination in the friendships of girls and boys. *Child Development, 73*(6), 1830-1843. <https://doi.org/10.1111/1467-8624.00509>

- Rose, A. J. (2021). The costs and benefits of co-rumination. *Child Development Perspectives*, 15(3), 176-181. <https://doi.org/10.1111/cdep.12419>
- Rose, A. J., Carlson, W., & Waller, E. M. (2007). Prospective associations of co-rumination with friendship and emotional adjustment: considering the socioemotional trade-offs of co-rumination. *Developmental Psychology*, 43(4), 1019-1031. <https://doi.org/10.1037/0012-1649.43.4.1019>
- Rose, A. J., Schwartz-Mette, R. A., Glick, G. C., Smith, R. L., & Luebke, A. M. (2014). An observational study of co-rumination in adolescent friendships. *Developmental Psychology*, 50(9), 2199-2209. <https://doi.org/10.1037/a0037465>
- Ruiz, F. J. (2010). A review of Acceptance and Commitment Therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcome studies. *International Journal of Psychology and Psychological Therapy*, 10(1), 125-162.
- Sawyer, S. M., Azzopardi, P. S., Wickremarathne, D., & Patton, G. C. (2018). The age of adolescence. *The Lancet Child & Adolescent Health*, 2(3), 223-228. [https://doi.org/10.1016/S2352-4642\(18\)30022-1](https://doi.org/10.1016/S2352-4642(18)30022-1)
- Schriber, R. A., & Guyer, A. E. (2016). Adolescent neurobiological susceptibility to social context. *Developmental Cognitive Neuroscience*, 19, 1-18. <https://doi.org/10.1016/j.dcn.2015.12.009>
- Schwartz-Mette, R. A., & Rose, A. J. (2012). Co-rumination mediates contagion of internalizing symptoms within youths' friendships. *Developmental Psychology*, 48(5), 1355-1365. <https://doi.org/10.1037/a0027484>

- Spendelov, J. S., Simonds, L. M., & Avery, R. E. (2017). The relationship between co-rumination and internalizing problems: A systematic review and meta-analysis. *Clinical Psychology & Psychotherapy*, 24(2), 512-527. <https://doi.org/10.1002/cpp.2023>
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of Internal Medicine*, 166(10), 1092-1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Starr, L. R., Huang, M., & Scarpulla, E. (2021). Does it help to talk about it? Co-rumination, internalizing symptoms, and committed action during the COVID-19 global pandemic. *Journal of Contextual Behavioral Science*, 21, 187-195. <https://doi.org/10.1016/j.jcbs.2021.07.004>
- Starr, L. R., & Davila, J. (2009). Clarifying co-rumination: Associations with internalizing symptoms and romantic involvement among adolescent girls. *Journal of Adolescence*, 32(1), 19–37. <https://doi.org/10.1016/j.adolescence.2007.12.005>
- Steinberg, L. (2008). A Social Neuroscience Perspective on Adolescent Risk-Taking. *Developmental Review: DR*, 28(1), 78-106. <https://doi.org/10.1016/j.dr.2007.08.002>
- Stone, L. B., Uhrlas, D. J., & Gibb, B. E. (2010). Co-rumination and lifetime history of depressive disorders in children. *Journal of Clinical Child and Adolescent Psychology*, 39(4), 597-602. <https://doi.org/10.1080/15374416.2010.486323>
- Stone, L. B., Hankin, B. L., Gibb, B. E., & Abela, J. R. (2011). Co-rumination predicts the onset of depressive disorders during adolescence. *Journal of Abnormal Psychology*, 120(3), 752-757. <https://doi.org/10.1037/a0023384>

- Turner, N., Joinson, C., Peters, T. J., Wiles, N., & Lewis, G. (2014). Validity of the Short Mood and Feelings Questionnaire in late adolescence. *Psychological Assessment, 26*(3), 752–762. <https://doi.org/10.1037/a0036572>
- Van den Bos, W., Westenberg, M., Van Dijk, E., & Crone, E. A. (2010). Development of trust and reciprocity in adolescence. *Cognitive Development, 25*(1), 90-102.
<http://dx.doi.org/10.1016/j.cogdev.2009.07.004>
- Venta, A., Sharp, C., & Hart, J. (2012). The relation between anxiety disorder and experiential avoidance in inpatient adolescents. *Psychological Assessment, 24*(1), 240-248.
<https://doi.org/10.1037/a0025362>
- Viner, R. M., Ross, D., Hardy, R., Kuh, D., Power, C., Johnson, A., Wellings, K., McCambridge, J., Cole, T. J., Kelly, Y., & Batty, G. D. (2015). Life course epidemiology: Recognising the importance of adolescence. *Journal of Epidemiology and Community Health, 69*(8), 719-720. <https://doi.org/10.1136/jech-2014-205300>
- Waller, E. M., & Rose, A. J. (2010). Adjustment trade-offs of co-rumination in mother–adolescent relationships. *Journal of Adolescence, 33*(3), 487-497.
<https://doi.org/10.1016/j.adolescence.2009.06.002>
- Willems, Y. E., Finkenauer, C., & Kerkhof, P. (2020). The role of disclosure in relationships. *Current Opinion in Psychology, 31*, 33-37. <https://doi.org/10.1016/j.copsyc.2019.07.032>
- Yurgelun-Todd, D. (2007). Emotional and cognitive changes during adolescence. *Current Opinion in Neurobiology, 17*(2), 251-257. <https://doi.org/10.1016/j.conb.2007.03.009>
- Zimmermann, P., & Iwanski, A. (2014). Emotion regulation from early adolescence to emerging adulthood and middle adulthood: Age differences, gender differences, and emotion-

specific developmental variations. *International Journal of Behavioral Development*,
38(2), 182-194. <https://doi.org/10.1177/0165025413515405>

APPENDICES

Appendix A: Demographic Questions

How would you describe your child's racial/ethnic background?

1. African American
2. Asian American
3. European American (Caucasian)
4. Hispanic or Latino
5. Native American
6. Native Hawaiian or Pacific Islander
7. Biracial
8. Other

What is your child's gender identity?

1. Female
2. Male
3. Transgender female
4. Transgender male
5. Gender non-conforming
6. Prefer not to answer

Appendix B: Co-Rumination Questionnaire

Read the following sentences and decide how true these sentences are about you and a close friend.

	Not at all true (1)	Slightly true (2)	Somewhat true (3)	Mostly true (4)	Completely true (5)
1. We spend most of our time together talking about problems that my friend or I have.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. After my friend tells me about a problem, I always try to get my friend to talk more about it later.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. When I have a problem, my friend always tries really hard to keep me talking about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. When one of us has a problem, we talk about it for a long time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. When we see each other, if one of us has a problem, we will talk about the problem even if we had planned to do something else together.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. When my friend has a problem, I always try to get my friend to tell me every detail about what happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. After I've told my friend about a problem, my friend always tries to get me to talk more about it later.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. We talk about problems that my friend or I are having almost every time we see each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. If one of us has a problem, we will spend our time together	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

talking about it, no matter what else we could do instead.					
11. When my friend has a problem, I always try really hard to keep my friend talking about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. When I have a problem, my friend always tries to get me to tell every detail about what happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. We will keep talking even after we both know all of the details about what happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. We talk for a long time trying to figure out all the different reasons why the problem might have happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. We try to figure out every one of the bad things that might happen because of the problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. We spend a lot of time trying to figure out parts of the problem we can't understand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. We talk a lot about how bad the person with the problem feels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. We'll talk about every part of the problem over and over.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. We talk a lot about the problem in order to understand why it happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. We talk a lot about all of the different bad things that might happen because of the problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. We talk a lot about parts of the problem that don't make sense to us.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. We talk for a long time about how upset it has made one of us with the problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. We usually talk about that problem every day even if nothing new has happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. We talk about all of the reasons why the problem might have happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. We spend a lot of time talking about what bad things are going to happen because of the problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. We try to figure out everything about the problem, even if there are parts we may never understand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. We spend a long time talking about how sad or mad the person with the problem feels.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix C: Acceptance and Action Questionnaire

Below you will find a list of statements. Please rate the truth of each statement as it applies to you. Use the following scale to make your choice.

	Never true (1)	Very seldom true (2)	Seldom true (3)	Sometimes true (4)	Frequently true (5)	Almost always true (6)	Always true (7)
I am able to take action on a problem, even if I am uncertain what the right thing to do is.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often catch myself daydreaming about things I've done and what I would do differently next time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I feel depressed or anxious, I am unable to take care of my responsibilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I rarely worry about getting my anxieties, worries, and feelings under control.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm not afraid of my feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I evaluate something negatively, I usually recognize that this is just a reaction, not an objective fact.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I compare myself to other people, it seems that most of them are handling their lives better than I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety is bad.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I could magically remove all the painful experiences I've had in my life, I would do so.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix D: Generalized Anxiety Disorder-7

Over the PAST TWO WEEKS, how often have you been bothered by the following problems?

	Not at all (0)	Several days (1)	Over half the days (2)	Nearly every day (3)
1. Feeling nervous, anxious, or on edge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Not being able to stop or control worrying.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Worrying too much about different things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Trouble relaxing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Being so restless that it's hard to sit still	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Becoming easily annoyed or irritable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Feeling afraid, as if something awful might happen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix E: Short Mood and Feelings Questionnaire

These questions ask about how you have been feeling or acting recently. Over the PAST TWO WEEKS, how true are the following statements for you?

	Not true (1)	Sometimes true (2)	True (3)
1. I felt miserable or unhappy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I didn't enjoy anything at all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I felt so tired I just sat around and did nothing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I was very restless.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I felt I was no good anymore.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I cried a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I found it hard to think properly or concentrate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I hated myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I was a bad person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I felt lonely.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I thought nobody really loved me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I thought I could never be as good as other kids.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I did everything wrong.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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