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Language Patterns as Concurrent and Longitudinal Predictors of Depression in Adolescence

A thesis submitted in partial fulfillment of the requirement
for the degree of Bachelor of Science in Psychology from
The College of William and Mary

by

Connor William Symons

Accepted for _____
(Honors, High Honors, Highest Honors)

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April 28, 2017

Language Patterns as Concurrent and Longitudinal Predictors of Depression in Adolescence

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Abstract

A growing body of literature using primarily samples of adults suggests a link between specific patterns of language use and depression (e.g., Rude, Gortner, & Pennebaker, 2004). The current study sought to evaluate whether this link might exist in adolescence, particularly given the rise in depression that occurs in this stage (Garber, Weiss, & Shanley, 1993). This linkage was investigated using a cross-sectional and 2-year longitudinal design, utilizing a community sample of 192 adolescents (M_{age} = 12.65, 53.1% girls, 76.0% White, middle-class). Adolescents reported on their depression and engaged in a 15-minute discussion task with their good friend. Four specific patterns of language use were evaluated from the videotaped discussion task and included pronouns, tense, positive and negative emotion word use and specific negative emotion word use. Further, the role of gender was examined as a potential moderator of the relation between language use and depression. Relations were found between language patterns and depression both concurrently and longitudinally, with notable developmental differences. At both time points, first-person singular pronouns predicted greater depressive symptoms. Second-person pronoun use significantly predicted greater depressive symptoms concurrently. Use of present tense significantly predicted depressive symptoms concurrently, whereas future tense use significantly predicted greater depressive symptoms at both time points. Adolescents who used more sadness emotion words reported greater depressive symptoms. Gender moderated the relation between positive emotion words and depressive symptoms concurrently and at both time points for anxiety words and depressive symptoms. Taken together, these findings add to our understanding of depression, and may help to inform preventative intervention for adolescent depression.

Language Patterns as Concurrent and Longitudinal Predictors of Depression in Adolescence

Depression in adolescence is a public health concern with a prevalence over twice that of depression in prepubescent children (Costello, Erkanli, & Angold, 2006). Adolescent use of antidepressants from 1998-2002 had an adjusted annual increase of 9.8% (Delate, Gelenberg, Simmons, & Motheral, 2004). Further, depression in adolescence seems to manifest itself differently than in adults, with symptom differences related to cognitive maturity levels (Garber, Weiss, & Shanley, 1993). Specifically, a high level of adolescent symptomology is associated with negative automatic thoughts, hopelessness, and a helplessness attributional style. Egocentrism, which consists of self-consciousness and self-focus, is also correlated with depression in adolescents, but to a lesser extent than these other factors. Garber et al. (1993) postulated that egocentrism could be normative for adolescents further complicating the diagnostic picture of depression in adolescence. Due to the somewhat unique nature of adolescent depression, further investigation into potential age-related changes that may be predictive of the development of depressive symptomology are warranted. One such area worthy of investigation is language use in everyday conversation. That is, linguistic clues may forewarn of depressive symptomology.

Language encompasses a vast area of study, and there are a multitude of aspects of language that can be examined in relation to depression, including linguistic processes (e.g., function words, tense morphemes), psychological processes (e.g., emotion words, insight words), personal concerns (e.g., work words, family words), and use of speaking-specific words (e.g., fillers, nonfluencies) (Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007). The study of

psychological processes in language is potentially beneficial to understanding the link between language and depression.

Studying linguistic processes specifically allows for insight into how depressed individuals may view themselves and their social groups. Uncovering patterns of change in language could therefore prove valuable clinically as a potential metric for tracking depression-related changes in cognition. As such, a small, yet growing body of research has developed in recent years investigating the link between specific patterns of language use and depression, negative affect, and suicidality (Baddeley, Daniel, & Pennebaker, 2011; Bernard, Baddeley, Rodriguez, & Burke, 2016; Fast & Funder, 2010; Rodriguez, Holleran, & Mehl, 2010; Rude, Gortner, & Pennebaker, 2004; Stirman & Pennebaker, 2001). Despite the small number of studies in this young subfield of language, a cluster of related findings has emerged across the literature over the past decade and a half.

Perhaps the starkest changes in language use are found in relation to suicide. Research investigating writings of adults who eventually committed suicide has yielded two findings relating to pronoun use. The first set of findings was found in a study of the works of suicidal (n = 9, M_{age} = 41 years) and non-suicidal (n = 9, M_{age}= 43 years) poets, which demonstrated that poets who committed suicide used more first-person singular pronouns (i.e., *I, me, my*) than their counterparts (Stirman & Pennebaker, 2001). Interpreting their findings using Durkheim's (1951, as cited in Stirman & Pennebaker, 2001) social integration/disengagement model of suicide, Stirman and Pennebaker (2001) suggested that a decrease in first-person singular pronouns is indicative of a decreased interest in social relationships. If a suicidal individual becomes detached from social life, they argued, the individual is more likely to reference the self than a collective. Their findings were bolstered by those of Baddeley, Daniel, and Pennebaker (2011) in

a case study involving the longitudinal analysis of the writings of a 42-year-old man who committed suicide. Baddeley and colleagues (2011) found that the man used both more first-person singular pronouns and fewer first-person plural pronouns in his writings as he approached his death. Although their findings provide further evidence that social withdrawal could be related to language change in suicidal individuals, Baddeley and colleagues (2011) also suggested that increased self-focus, as predicted by cognitive theories of depression (e.g., Beck 1979; Clark & Beck, 1999; Pyszczynski & Greenberg, 1987), could be a factor. These theories argue that depressed individuals focus on the self when negative outcomes arise (Clark & Beck 1999; Pyszczynski & Greenberg, 1987) and engage in "a massive amount of self-criticism" (Beck, Rush, Shaw, & Emery 1979, p. 99). Taken together, Stirman and Pennebaker (2001) and Baddeley et al. (2011) suggest that symptoms of suicidality, whether they be disengagement, self-focus, or both, are related to unique patterns of language use.

Although depression and suicide are related (American Psychiatric Association, APA, 2013), key differences appear in the findings of studies that focus on how depressed undergraduate students use pronouns when compared to samples of suicidal adults. First, an increase in first-person singular pronoun use is found in depressed populations (Bernard et al., 2016; Fast & Funder, 2010; Rude et al., 2004) and in suicidal populations (Stirman & Pennebaker, 2001; Baddeley et al., 2011). However, there do not appear to be any significant findings suggesting a decrease in first-person plural pronouns in depressed individuals as has been found for suicidal adults. This suggests that pronoun changes in depressed individuals may be related to self-focus, as there are no data to indicate a decrease in interest in social relationships as fewer first-person plural pronouns might suggest. Yet, the continued presence of an increase in first-person singular pronouns is consistent with a relationship to self-focus. This

supposition is further supported by the finding that depressed women, who tend to self-focus more than depressed men (Butler & Nolen-Hoeksema, 1994) also use more first-person singular pronouns than depressed men (Fast & Funder, 2010). Additionally, in a study employing a timed writing sample, formerly depressed individuals did not demonstrate a change in pronoun use when compared to never depressed individuals until the last third of the task, at which point they used more first-person singular pronouns (Rude et al., 2004). Rude and colleagues. (2004) posited that this could be due to formerly depressed individuals having difficulty suppressing depressive thoughts and becoming "progressively more ensnared" (p. 1130) in self-focus.

Depressed individuals have also been shown to use more third-person singular pronouns (e.g., "she", "her", "hers") than non-depressed individuals (Bernard et al., 2016). Citing research that suggests that other-focus is a form of emotion regulation (e.g., Dolcos & Albarracin, 2014; Zell, Warriner, & Albarracin, 2012), Bernard et al. (2016) argue that increasing use of third-person singular pronouns is an effort to regulate self-focus through "other talk". Taken together, the research by Fast and Funder (2010), Rude et al. (2004), and Bernard et al. (2016) complement the findings regarding the relation between pronoun use and suicide, while establishing a clearer connection between self-focus and language change.

Research on depression, suicide, affect, and language has also yielded findings beyond changes in pronouns. Individuals experiencing negative affect use more negative emotion words (e.g., sad) than those with neutral or positive affect (Bernard et al., 2016). In their study of poets, Stirman and Pennebaker (2001) found that suicidal poets use fewer communication words than their non-suicidal counterparts (e.g., talk, share, listen), which they argue is indicative of social disengagement. Depressed adults use more negatively valenced words (e.g. inadequate, gloom,

fight; Rude et al., 2004), more past-tense verbs, and fewer positive emotion words (e.g., happy) than their non-depressed peers (Rodriguez et al., 2010).

Additional correlations between language use and depression vary depending on the intended audience (Rodriguez et al., 2010). That is, while writing in a private journal, depressed individuals used more sadness, cognitive mechanism (e.g., consider), causation (e.g., because), insight (e.g., consider), discrepancy (e.g., should), and metaphysical or religious words (e.g., God). In contrast, when writing in a public blog, depressed individuals used more swear and sleep (e.g., fatigue) words. Rodriguez et al. (2010) believe that this discrepancy occurs as a result of depressed individuals only being willing to discuss socially acceptable symptoms of depression while writing publicly. Although these findings are not as consistent across studies as those findings for pronouns, they clearly tie in with the symptoms of depression (APA, 2013). In a study on assessments of depression by laypersons, it was discovered that they could accurately diagnose depression based on material in both journals and blogs, and that in doing this, they intuitively chose many of the same markers as have been validated by empirical research (e.g., past-tense verbs; Rodriguez et al., 2010). Further, laypersons were able to appropriately apply private journal-specific markers (e.g., causation words) to only journals and blog-specific markers (e.g., sleep words) to only blogs. In all, these studies demonstrate that specific changes in language patterns are associated with depression, and that these patterns are intuitively noticeable to the untrained observer. To date, all of these studies have examined these relations using cross-sectional designs so it is possible that the directionality of findings also operates in the reverse order such that the use of first-person pronouns may lead to more depression.

In addition to depression, suicidality, and affect, age is also connected to specific patterns of language use. In a cross-sectional study of over 3,000 individuals ages 8 to 85 years (M_{age}=

23.8 years) and a longitudinal study of 10 individuals, Pennebaker and Stone (2003) found a variety of changes in the way language is used over time. One such change was that first-person singular pronoun use decreased over time; first-person singular pronouns comprised a higher percentage of words uttered for 8-14 year-olds (*M* = 11.76% pronouns) than individuals who were 70-years-old or older (*M* = 7.95% pronouns). Another change was an increase in positive emotion words and a decrease in negative emotion words with age. Due to the centrality of these linguistic changes to the literature linking language and depression, it is important to note that the above studies that support this link have used either undergraduate students (Bernard et al., 2016; Fast & Funder 2010; Rodriguez et al., 2010; Rude et al., 2004) or adults (Baddeley et al., 2011; Stirman & Pennebaker, 2001). It is therefore unclear if the connection between these language patterns and depression are evident in populations of younger ages, such as adolescents, or whether this pattern is only adult-specific.

When one considers that adolescent depression differs in symptomology from adult depression (Garber et al., 1993) and that self-focus is normative in adolescence, it is unclear if the language patterns found in adult populations will be found in adolescents. For example, if depressive self-focus is, in fact, motivating an increase in first-person singular pronoun use, it may be difficult to distinguish from any possible increases from age-related normative self-focus. However, because self-focus and egocentrism were still significantly linked to depression in adolescents (Garber et al. 1993), it is still possible that these changes will be detected. Thus, the purpose of the current study was to investigate whether there are any links between language use and depression both concurrently and prospectively in an early adolescent age sample. The findings of this research could potentially provide important information regarding indicators and predictors of depression during a time when the incidence of depression is increasing.

In order to address changes in both language use and depression throughout development, samples of natural speech were collected from a community sample of adolescents ages 10 to 15 years who participated in a discussion task with a friend about a problem they had faced. Based on this sample of speech, their pronoun use, tense use, and emotion word use were evaluated. Although many prior studies on adult populations have used writing samples to analyze patterns of language use in depressed individuals (Bernard et al., 2016; Rodriguez et al., 2010; Rude et al., 2004), there is a precedent for using transcriptions for this purpose (Fast & Funder, 2010). In the present study, transcriptions of a discussion task between best friends offered the greatest possible ecological validity, and were therefore chosen over writing samples. These youth also completed self-reported assessments of depression and anxious symptomatology at the same time as the speech sample was collected and then two years later, in order to evaluate potential longitudinal effects. Given the high rate of comorbidity between anxiety and depression (Garber & Weersing, 2010), symptoms of anxiety were also evaluated in order to covary these effects to provide a more pure sample of depression. Self-report of these internalizing symptoms were used because adolescents have the most accurate assessment of their internal, emotional states in comparison to parent, teacher, or peer reports (McConaughy, Achenbach, & Gent, 1988)

Based on the available literature, the following hypotheses were generated. For pronoun use, there were three hypotheses. First, we anticipated that the use of more first-person singular pronouns would be related concurrently to more depressive symptoms while controlling for anxious symptoms. Second, given gender differences in the adult literature (Fast & Funder, 2010), we expected gender differences in our sample such that girls would use more first-person singular pronouns than boys. Third, we predicted that the use of more third-person singular pronouns would be related concurrently to more depressive symptoms while controlling for

anxious symptoms. Additionally, we tested first-person plural, second-person, and third-person plural pronoun groups to ensure that age or task did not elicit any additional effects, but did not expect any further pronoun-related findings.

Regarding tense use, we predicted that use of past-tense words would be positively related to depressive symptoms concurrently while controlling for anxious symptoms. We tested all tense groups (i.e., past tense, present tense, and future tense) but did not expect any further significant tense-related findings.

Finally, for emotion word use, we anticipated that negative emotion word use, especially sadness words, would be related concurrently to more depressive symptoms while controlling for anxious symptoms. We tested all emotion groups (i.e., positive, negative, sadness, anger, and anxiety), but did not expect any further significant emotion-related findings.

Given the lack of longitudinal studies examining language use as a predictor of depression with adult samples and no such research with adolescent samples, our analyses are exploratory and no hypotheses are offered.

Method

Participants

At the first time point (T1), participants were adolescents (n = 202, 52.0% girls) in reciprocated same-sex best friend dyads (n = 101 dyads). Due to technical failures, the linguistic data for 10 adolescents were lost and therefore excluded from the present study (n = 192, 53.1% girls). Adolescents were enrolled in grades 6-8 (M_{age} = 12.65, SD = 1.04) and lived in Virginia (n = 180) and Maryland (n = 12). Adolescents were generally of middle- to high-socioeconomic status (M = 49.6, SD = 9.8) based on the Hollingshead (1975) system. Adolescents self-identified as White (76.0%), Black (18.8%), and other (4.7%). Adolescents and their parents (n = 167)

were both recruited as part of a larger study, but only adolescent-reported data were used in the present study.

At the second time point (T2) approximately two years later (M_{months} = 23.54, *SD* = 4.14), participants (*n* = 169, 52.1% girls, retention = 83.7%) participated individually. Of those participants, 9 were missing linguistic data from T1 and were thus excluded from the present study leaving a sample of 160 adolescents (52.8% girls). These adolescents self-identified as White (77.0%), Black (18.6%), and other (4.4%).

Measures

Depression. *The Children's Depression Inventory* (CDI; Kovacs, 1992) was administered to evaluate depressive symptoms over the past two weeks. The CDI is a 27-item depression inventory is validated for youth ages 7-16 years and is comprised of five subscales: negative mood, negative self-esteem, anhedonia, ineffectiveness, and interpersonal problems For each item, youth were asked how often in the last two weeks they experienced various depressive symptoms using a 3-point scale (i.e., 0 = *once in a while*, 1 = *many times*, 2 = *all the time*). One item, pertaining to suicidality, was omitted. The scores for each item were tallied to create a score for each subscale and an overall score. The internal consistency was strong at T1 (α = .86) and T2 (α = .86). Validity and reliability of the CDI has been established (Kovacs, 1992) Using a minimum raw score of 13 (Smucker, Craighead, Craighead, & Green, 1986), 31 participants (15.3% of sample , 61.3% girls) qualified as having a mildly depressed mood at T1 and 25 participants (15.63% of sample, 68% girls) qualified as having a mildly depressed mood at T2.

Anxiety. *The Multidimensional Anxiety Scale for Children- 10* (MASC-10; March, 2008) is a short form of the MASC that was administered to evaluate anxious symptoms at T1 and *The Multidimensional Anxiety Scale for Children* (MASC; March, 2008) was used to evaluate

anxious symptoms at T2. The MASC-10 is a 10-item version of the 39-item MASC. They are anxiety questionnaires that have been validated for ages 8-19 and contain scales for physical symptoms (i.e., tension and somatic symptoms), harm avoidance (i.e., perfectionism and anxious coping), social anxiety (i.e., humiliation fears and performance fears), and separation/panic. For each item, participants were asked to rate how much the statement is true for them on a 4-point scale (0 = *never true about me*, 1 = *rarely true about me*, 2 = *sometimes true about me*, 3 = *often true about me*). The MASC benefits from broad conceptualization of anxiety, specific dimensions of anxiety, matching the DSM-IV criteria, strong reliability, convergent validity, and divergent validity. The internal consistency was good at T1 ($\alpha = .76$) and strong at T2 ($\alpha = .92$). Using a minimum T-score of 65 (March, 2008), 34 adolescents qualified as having mild anxiety at T1 (17.7% of sample, 52.9% boys) and 21 participants qualified as having mild anxiety at T2 (13.13% of sample, 66.67% girls).

Discussion Task. Patterns of language use were assessed through analysis of transcriptions of best friend dyad discussion tasks at T1. Each adolescent was instructed to think of a problem he or she currently had (e.g., school, peer relationships) and discuss it with their best friend as he or she typically would. The dyad had 15 minutes to discuss both of their problems but did not have to talk for the full time period. The discussion was videotaped using a laptop computer. The discussion task was then transcribed from the video recording and double checked by another transcriber for accuracy. The transcriptions were split into a text file for each participant, cleaned to prevent inaccurate coding (e.g., the nonfluency “like” being coded as the affective “like”), and analyzed using a computer program.

The *Linguistic Inquiry and Word Count* (LIWC; Pennebaker et al., 2007) is a computer program that analyzes word use in text files. The program does this through use of a dictionary

containing nearly 4,500 words and stems divided into 4 categories (linguistic processes, psychological processes, personal concerns, and spoken categories) each with their own subcategories, each containing a list of words. The words in each subcategory are tallied in the text and reported to the user, along with percentage rates of word use for subcategories (e.g., first-person singular pronouns, past tense).

The LIWC was used instead of other methods for a variety of reasons. Primarily, the LIWC's dictionary contains all categories of interest from previous literature (e.g., first person singular pronouns, first person plural pronouns, negative emotion, and past tense). This renders the ability to create a custom dictionary moot. Additionally, a strong precedent for use of the LIWC has been set by the pre-existing literature (Baddeley et al., 2011; Bernard et al., 2016; Fast & Funder, 2010; Pennebaker and Stone 2003; Rodriguez et al., 2010; Rude et al., 2004; Stirman & Pennebaker, 2001). Although it would certainly be valuable to examine the link between language and depression using other methods of linguistic analysis, breaking with the literature in method could introduce an unnecessary confounding variable for the present study and make it difficult to compare these findings to those already published.

Procedure

The research study was approved by the College of William and Mary (PHSC-2014-03-14-9428-jlzema, PHSC-2016-02-19-10958-jlzema). As part of a larger study on friendship and emotion regulation, best friend dyads were recruited from the community. At T1, dyads and their mothers were either met by researchers at home (62.5%), brought into a university laboratory (30.2%), or met by researchers at another location, such as a library (7.3%). Each mother or father then provided written consent for themselves and their child and each adolescent gave verbal assent. Adolescents were separated and individually read a battery of questionnaires by a

trained research assistant and indicated their responses on topics such as friendship quality, psychopathology, and demographics. Adolescents verbally indicated their responses. After completing the questionnaire battery, the friend dyad was brought together in a separate room for the discussion task. The researcher read the dyad their instructions, turned on a video camera, and then left the room. After 15 minutes, the researcher came back to the dyad, thanked them, and then each adolescent was paid $10 for their time.

Adolescents individually participated in a follow-up interview roughly two years later (M_{months} = 23.54, SD = 4.14). As with T1, written consent was obtained from mothers or fathers and verbal assent from the adolescents. Adolescents were read a battery of questionnaires by a trained research assistant and verbally indicated their responses. They were paid $10 for their time.

Analytic Plan

Correlations were run among the variables including gender and age to determine which variables may co-vary with others and may need to be covariates in regression analyses. Then, eight regression models were calculated; one for each language pattern (i.e., pronoun use, tense use, dichotomous emotion words, and specific negative emotion words) predicting to T1 and T2 depression. Given the pattern of correlations, gender was entered as a moderator and anxiety as a co-variate. In step 1, the raw MASC score from the respective time point was entered to control for the effects of anxiety on depression. At step 2, gender and the specific language pattern were entered. In step 3, the interaction of gender with each specific variable in the language pattern were entered. For the pronoun groups, the specific variables were: first-person singular, first-person plural, second-person, third-person singular, third-person plural. For the tense group, the three tenses (i.e., past, present, and future) were used. For the dichotomous emotion word group,

positive emotion and negative emotion words were used. For the specific negative emotion word group, anxiety, anger, and sadness words were entered. Significant interactions with gender were explained by splitting the data and running independent regressions for each gender.

Results

Descriptive Statistics

Table 1 contains descriptive statistics (i.e., means, standard deviations) for all study variables. Table 2 contains all correlations of gender, T1 age, T1 and T2 anxious symptoms, T1 and T2 depressive symptoms, and pronoun use. Table 3 contains all correlations of gender, T1 age, T1 and T2 anxious symptoms, T1 and T2 depressive symptoms, and tense use. Table 4 contains all correlations of gender, T1 age, T1 and T2 anxious symptoms, T1 and T2 depressive symptoms, emotion word use.

Regarding comorbidity issues, depressive symptoms were positively correlated with anxious symptoms at T1 and at T2, thus anxiety was used as a covariate in analyses. Age was positively correlated with depressive and anxious symptoms. Anxious symptoms were significantly correlated with gender such that girls reported more anxious symptoms than boys.

Use of first-person singular pronouns was positively correlated with depressive symptoms at T1 and T2. Use of first-person plural pronouns was negatively correlated with depressive symptoms at T2. Second-person pronoun use was also positively correlated with depressive symptoms at T1. Use of third-person singular pronouns was not significantly correlated with depressive symptoms. Use of first-person singular pronouns was significantly correlated with gender such that girls were more likely to use first-person singular pronouns than boys.

Use of future tense was negatively correlated with depressive symptoms at T1 and T2. Use of past tense was not significantly correlated with depressive symptoms. Use of past tense was correlated with gender such that girls were more likely to use past tense than boys

Neither positive nor negative emotion word use correlated significantly with depressive symptoms or gender. Use of neither sadness, anger, nor anxiety emotion words correlated significantly with depressive symptoms or gender.

Regression Analyses of Pronouns

Step 1 of the cross-sectional regression resulted in a significant model ($F(1, 190) = 26.69$, $p = .001$, $R^2 = .12$). The covariate, anxiety, was significantly associated with depression ($b = .404$, $t = 5.17$, $p = .001$). Step 2 resulted in significant change to the model, $F(7, 184) = 6.59$, $p = .001$, $R^2 = .20$. When examining the five predictors (i.e., first-person singular, first-person plural, second-person, third-person singular, and third-person plural), the use of first-person singular pronouns was a significant predictor of depressive symptoms ($b = .475$, $t = 2.98$, $p = .003$), such that adolescents who used more first-person singular pronouns reported more depressive symptoms. Use of second-person pronouns (e.g., you) was also a significant predictor of depression ($b = .703$, $t = 3.00$, $p = .003$), such that adolescents who use more second-person singular pronouns reported more depressive symptoms. Use of first-person plural pronouns was not a significant predictor of depressive symptoms, nor were third-person singular pronouns, and third-person plural pronouns. Although the model was significant in Step 3, ($F(12, 179) = 3.89$, $p = .001$, $R^2 = .21$), there were no significant interactions of any pronouns with gender. See Table 5 for regression results.

Step 1 of the longitudinal data regression resulted in a significant model ($F(1, 158) = 28.05$, $p = .001$, $R^2 = .15$). The covariate, T2 anxiety, was significantly associated with T2

depression (b = .131, t = 5.28, p = .001). Step 2 resulted in a significant model (F(6, 153) = 6.80, p = .001, R^2 = .211). When examining the five predictive factors, use of first-person singular pronouns was a significant predictor of T2 depression (b = .342, t = 2.06, p = .041), such that adolescents who used more first-person singular pronouns at T1 reported more depressive symptoms at T2. None of the other pronouns were predictors of T2 depression. Although the model was significant in Step 3, F(11,148) = 4.049, p = .001, R^2 = .231, there was no significant gender moderation. See Table 5.

Regression Analyses of Tense

Step 1 of the cross-sectional regression resulted in a significant model, F(1, 190) = 26.69, p = .001, R^2 = .12. The covariate, anxiety, was significantly associated with depression (b = .404, t = 5.16, p = .001). Step 2 resulted in significant change to the model, F(5,186) = 7.95, p = .001, R^2 = .18. When examining the three predictive factors (i.e., past, present, and future tense), use of present tense was a significant predictor of depression (b = .455, t = 1.89, p = .05), such that adolescents who used more present tense reported more depressive symptoms. Use of future tense was also a significant predictor of depression (b = -1.151, t = -2.12, p = .04), such that adolescents who used less future tense reported more depressive symptoms. Use of past tense was a marginally significant predictor of depression (b = .455, t = 1.89, p = .06). In step 3 the model was significant, F(8, 183) = 5.09, p = .001, R^2 = .182, but there were no significant interactions with gender. See Table 6.

Step 1 of the longitudinal data regression resulted in a significant model, F(1, 158) = 28.05, p = .001, R^2 = .15. The covariate, T2 anxiety, was significantly associated with T2 depression (b = .131, t = 5.28, p = .001). Step 2 resulted in a significant model (F(4, 155) = 8.40, p = .001). Examining the three predictive factors, use of future tense at T1 was a significant

predictor of depression at T2 (b = -1.250, t = -2.05, p = .04), such that adolescents who used less future tense at T1 reported more depressive symptoms at T2. Use of past tense and present tense at T1 was not a significant predictor of depression at T2. In Step 3 the model was significant $F(7, 152) = 4.80$, $p = .001$, $R^2 = .18$, but there were no significant interactions with gender predicting T2 depression for any of the tenses. See Table 6.

Regression Analyses of Positive and Negative Emotion Words

Step 1 of the cross-sectional regression resulted in a significant model, $F(1, 190) = 26.69$, $p = .001$, $R^2 = .12$. The covariate, anxiety, was significantly associated with depression ($b = .404$, $t = 5.17$, $p = .001$). Step 2 resulted in significant change to the model, $F(4,187) = 7.28$, $p = .001$, $R^2 = .14$. Neither of the two predictive factors (i.e., positive and negative emotion words), were a significant predictor of depression In step 3, the model was significant, $F(6,185) = 5.94$, $p = .001$, $R^2 = .16$. There was a significant interaction with gender and positive emotion words predicting to depression ($b = 1.099$, $t = 2.01$, $p = .05$). When breaking down this interaction, use of positive emotion words was a marginally significant predictor of depression for girls ($b = -.655$, $t = -1.76$, $p = .08$) such that girls who used fewer positive emotion words reported more depressive symptoms. Use of positive emotion words was not a significant predictor of depressive symptoms for boys ($b = .543$, $t = 1.37$, $p = .18$). See Table 7 and Figure 1.

Step 1 of the longitudinal regression resulted in a significant model, $F(1, 158) = 28.05$, $p = .001$, $R^2 = .15$. The covariate, T2 anxiety, was significantly associated with T2 depression ($b = .131$, $t = 5.28$, $p = .001$). Step 2 resulted in a significant model, $F(3, 156) = 9.41$, $p = .001$, $R^2 = .151$. When examining the two predictive factors, neither T1 use of negative emotion words nor T1 use of positive emotion words were significant predictors of T2 depression. In Step 3, the model was significant, $F(5, 154) = 6.95$, $p = .001$, $R^2 = .184$. There was a significant interaction

between T1 use of negative emotion words and gender predicting T2 depressive symptoms (b = -1.357, t = -2.21, p = .03). However, when further examining this interaction, use of negative emotion words was not a significant predictor of depression for either boys (b = -.356, t = -.84, p = .40) or girls (b = .695, t = 1.59, p = .12). See Table 7 and Figure 2.

Regression Analyses of Sadness, Anger, and Anxiety Emotion Words

Step 1 of the cross-sectional regression involving types of negative emotion words resulted in a significant model, $F(1, 190) = 26.69$, p = .001, R^2 = .12. The covariate, anxiety, was significantly associated with depression (b = .404, t = 5.17, p = .001). Step 2 resulted in significant change to the model, $F(5,186) = 7.37$, p = .001, R^2 = .17. When examining the three predictive factors (i.e., sadness, anger, and anxiety emotion words), use of sad emotion words was a significant predictor of depression (b = 3.50, t = 2.31, p = .02), such that adolescents who used more sad emotion words reported more depressive symptoms. Use of anger and anxious emotion words were not significant predictors of depressive symptoms, nor was use of anxious emotion words. In step 3, the model was significant, $F(8, 183) = 5.49$, p = .001, R^2 = .19. There was a significant interaction between gender and anxiety emotion words predicting depressive symptoms (b = 3.294, t = 2.43, p = .02). When breaking down this interaction, use of anxiety emotion words was a marginally significant predictor of depressive symptoms for boys (b = 1.890, t = 1.80, p = .08) such that boys who used more anxiety emotion words reported more depressive symptoms. Use of anxiety emotion words was not a significant predictor of depression for girls (b = -1.219, t = 1.40, p = .17). See Table 8 and Figure 3.

Step 1 of the longitudinal data regression resulted in a significant model, $F(1, 158)$ = 28.05, p = .001, R^2 = *.15*. The covariate, T2 anxiety, was significantly associated with T2 depression (b = .131, t = 5.28, p = .001). Step 2 resulted in a significant model, $F(4, 155) = 7.30$,

p = .001, R^2 = 16. When examining the three predictive factors, neither sadness, anger, nor anxiety emotion words were significant predictors of depression. In Step 3, the model was significant, $F(7, 152)$, p = .001, R^2 = .19. There was a significant interaction between gender and anxiety emotion words predicting to T2 depression (b = 3.316, t = 2.72, p = .03). When breaking down this interaction, use of anxiety emotion words predicted to T2 depression with marginal significance for girls (b = -1.759, t = -1.69, p = .09) such that girls who used fewer anxiety emotion words at T1 reported more depressive symptoms at T2. Use of anxiety emotion words at T1 did not significantly predict T2 depression for boys (b = 1.447, t = 1.49, p = .14). See Table 8 and Figure 4.

Discussion

A growing body of literature using primarily samples of adults suggests a link between specific patterns of language use and depression (e.g., Rude et al., 2004). The current study sought to evaluate whether this link might exist in adolescence, particularly given the rise in depression that occurs in this stage (Garber et al., 1993). This linkage was investigated using a cross-sectional and 2-year longitudinal design. Four specific patterns of language use were evaluated including pronouns, tense, positive and negative emotion word use and specific negative emotion word use. Further, the role of gender was examined as a potential moderator of the relation between language use and depression.

Pronoun use

The hypothesis that use of first-person singular pronouns would predict depression concurrently was supported by the data. This finding is highly consistent with previous research that has used small samples of adults and found that adults who used more first-person pronouns reported more depressive symptoms or were more likely to commit suicide (Baddeley et al.,

2011; Bernard et al., 2016; Fast & Funder, 2010; Rude et al., 2004; Stirman & Pennebaker, 2001). Notably, this relation emerged in the current data set despite the potential confound of developmental differences in both depression (e.g., self-focus being normative in adolescence; Garber et al., 1993) and language use (i.e., adolescents use more first-person singular pronouns than adults; Pennebaker & Stone, 2003). That is, this finding suggests that rates of first-person singular pronoun use are highly sensitive to self-focus, to the extent that even a small change in self-focus could lead to a distinct variation in language patterns. Attempting to disentangle these confounds could be a future direction for research, however it seems relatively difficult given how closely tied they are to age. Regardless, findings in the present study rise over and above these factors, which might have caused no discernable difference, to produce significant results.

First-person *plural* pronouns in the current study did not significantly predict to depression concurrently. This finding is consistent with research on adult depression (Rodriguez et al., 2010) but inconsistent with research examining individuals who committed suicide (Baddeley et al., 2011). Although researchers have argued that changes in both first-person singular and first-person plural pronouns might be tied to the social isolation aspect of Durkhiem's social integration/disintegration model of suicide (1951, as cited in Stirman & Pennebaker, 2001), the current findings suggest an alternative explanation. That is, a decrease in first-person plural pronouns might be tied to social isolation, but an increase in first-person singular pronouns might very well be connected to self-focus. Not only does this reasoning reconcile the two models, but it explains why no studies to date have been able to demonstrate a significant decrease in first-person plural pronouns in non-suicidal depressed populations.

Regarding the significant concurrent relation between second-person pronoun use and increased depression, these findings represent a novel addition to the literature. This relation,

however, might be more related to the type of task than to developmental differences. Researchers have previously postulated that the link between an increased use of third-person singular pronouns and depression might be an attempt to regulate self-focus through focusing on others (Bernard et al., 2016). It could then be argued that while other-talk manifests itself as an increase in third-person singular pronouns in a writing sample, it manifests itself as an increase in second-person pronouns in a dyadic conversation. This change could also be due to the problem-discussing nature of the task in which adolescents experiencing more depressive symptoms may be more likely to choose to discuss issues pertaining to their close friend as a form of distraction from their problems. Although this argument certainly has merit, our failure to significantly relate third-person singular pronoun use to depression (cf., Bernard et al., 2016) seems to support the notion that other-focus manifests itself differently depending upon the linguistic environment (i.e., dyadic conversation versus an essay).

Longitudinal findings regarding the use of pronouns to depressive symptoms two years later were novel. However, given the lack of research using longitudinal designs, interpretation of these findings are speculative and causality cannot be definitively established due to the lack of a third time point. At the very least, the relation between first-person singular pronoun use and later reports of depressive symptoms strengthens the ties of these phenomena and opens up new areas of investigation and implications for preventative interventions. As such, it is also conceivable that increases in first-person singular pronoun use and/or self-focus could not only be symptoms of depression, but contributing to or exacerbating symptoms of depression. This is an exciting area for future research.

Tense use

The significant negative relation between future tense use and concurrent depression symptoms found in this study was novel. One possible explanation lies in the documented high rate of hopelessness present in adolescent depression (Hankin, Abramson, & Siler, 2001). If depressed adolescents hold less hope for the future, they might reference it less. Another possible explanation is a mixture of the nature of the problem-focused discussion task and a helplessness attributional style (Garber et al., 1993). Adolescents with fewer depressive symptoms might talk more to their best friend about future actions to solve the problem in the discussion task than their friend with more depressive symptoms who may feel hopeless about solving the problem. Future research should incorporate measures of hopelessness and attributional styles to help disentangle the effects.

The significant positive relation between present tense use and concurrent depression was also novel. Considering the other concurrent findings on tense, this might occur by default. If both depressed and non-depressed adolescents do not vary on use of past tense, and depressed adolescents use less future tense than their non-depressed peers, due to hopelessness and helplessness, then they simply must use more present tense. It is also possible, however, that while adolescents who report less depressive symptomology focus on the future, depressed adolescents instead focus on the present, engaging in ruminative self-focus. The latter explanation supports both our model of pronoun use and our explanation of future tense use, and provides an interesting new direction for future research.

Longitudinal findings related to tense were novel and add incremental knowledge to the literature indicating a robust relation between the potential dynamic influence of depression and language use patterns. The significant negative relation between future tense use and T2 depressive symptoms may indicate a self-fulfilling prophesy. That is, if the adolescents adopt a

hopelessness attribution style and/or a lack future-oriented problem solving, it could be that this mindset is more likely to produce negative experiences or negative perceptions of experiences in the future, fueling the depressive symptoms.

Findings on tense use were neither consistent with the adult literature nor hypothesized. The only previously demonstrated link between tense and language was that higher rates of past tense usage concurrently predicted more depressive symptomology (Rodriguez et al., 2010). The present study failed to support that link. However, the positive significant correlation between age and use of the past tense offers an explanation of this linkage observed in the adult literature. If adolescents use the past tense less frequently than older individuals, it could very well be due to their having less of a past to reference. If depressed adolescents do not have many previous negative thoughts or experiences to mention, it is conceivable that this pattern does not emerge until later in life.

Positive and Negative Emotion Words

Neither positive nor negative emotion words had a significant direct relation to depressive symptoms concurrently or longitudinally. An interaction of gender with positive emotion words emerged and was significant for the cross-sectional data. However, when the findings were examined for each gender, they were marginally significant for the girls and nonsignificant for the boys. As such, the findings regarding positive and negative emotion word use were not consistent with the adult literature (cf., Baddeley et al., 2011; Rodriguez et al., 2010; Rude et al., 2004). Interestingly, gender significantly interacted with positive emotion use to predict concurrent depressive symptoms for girls only. The findings indicate that boys and girls employ different language patterns, and therefore suggest that boys discuss feelings differently than girls. This basic finding has been documented in the emotion development

literature which is tied to early emotion socialization practices by parents (Zeman, Cassano, & Adrian, 2013). It is interesting that these different patterns of emotion word use are then linked concurrently and longitudinally to depressive symptoms.

Specific Negative Emotion Words

Regarding the findings concerning use of specific negative valence emotion words (i.e., sadness, anger, anxiety), higher use of sadness words was concurrently related to more depressive symptoms, which makes intuitive sense and is consistent with the adult literature (e.g., Rodriguez et al., 2010). As with positive and negative emotion words, however, the gender interaction provided intriguing, novel findings. Specifically, higher usage rates of anxiety words predicted greater concurrent depressive symptoms for boys but not girls. This finding was marginally significant and must be interpreted with caution. It is interesting that this finding emerged even after controlling for the effects of anxiety symptoms. This could suggest that use of anxiety words is not entirely tied to anxious symptomology for boys.

Regarding the longitudinal effects, the use of anxiety words was not a significant predictor of T2 depression for boys, but use of anxiety words was a significant predictor for T2 depression in girls, such that fewer anxiety words were related to greater depressive symptomology. As such, boys and girls appear to have relations between anxiety words and depression that are in opposite directions. It will be important to consider the role of anxiety expression within the context of close friendships. It may be that expressing worry within a close relationship may be more beneficial for girls than boys over the long term. Perhaps girls receive more support from their friends when expressing anxiety, which then is related to fewer depressive symptoms. As the literature offers no clear explanation for this pattern of findings, it must be left to future research to investigate this intriguing interaction.

Taking these findings together with those in the adult literature highlights the notion that adolescent depression is different than, but not separate from, adult depression. The relation between first-person singular pronoun use and depression, which is a near-universal finding in research using adult populations (Baddeley et al., 2010; Bernard et al., 2016; Fast & Funder, 2010; Rude et al., 2004; Stirman & Pennebaker 2001), was replicated in this sample. Differences emerged in regard to third-person singular and second-person pronouns, perhaps due to the nature of the data collection. However, developmental differences between this adolescent sample in comparison to the literature using adult samples did emerge in regard to tense use. While the adult literature had previously found higher rates of past tense use to be related to more depressive symptoms (Rodriguez et al., 2010), the present study found no such link in our sample. Instead, a positive relation between present tense and depressive symptoms and a negative link between future tense and depressive symptoms were found. Additionally, the present study failed to replicate the findings in the adult literature that related overall positive and negative word use to depression (Baddeley et al., 2011; Rodriguez et al., 2010; Rude et al., 2004). Finally, an association between the use of sadness emotion words and depression, which was demonstrated in studies using adult populations (Rodriguez et al., 2010), was found in this current research. On the whole, the current study strongly supports the postulated link between depressive self-focus and language and suggest that investigating language use is a valuable direction for future research.

Limitations and Future Research

The present study was the first of its kind to our knowledge to address the link between language and depression in adolescents, to control for the potential role of comorbid anxiety when assessing the relation between language and depression, and to investigate the link between

language and depression over time. Some limitations should be taken into consideration, however. Primarily, causality cannot be established due to a lack of a third time point. Thus, it is not known whether depression may prompt the use of specific language patterns or whether the language patterns are related to the development or exacerbation of depressive symptoms. Evidence of causality would certainly prove invaluable, and future research should be conducted to examine whether a causal link exists. Second, depression and anxiety were assessed solely through use of self-report questionnaires administered via interview, and could stand to gain through incorporation of a third-party assessment of symptomology. However, adolescents may be the best able to report on their internal emotional states as they may not be readily observable to others (De Los Reyes et al., 2015). Third, changes in language use could not be assessed or covaried due to linguistic data only being collected at the first time point. Future research should take these factors into account, perhaps as a method to address the intriguing interactions between gender and emotion word use. Fourth, the linguistic sample was only collected in English. Findings, therefore, are of uncertain generalizability to non-English speakers. As such, future research should investigate the relation between other languages and depression. Fifth, the sample of linguistic patterns was collected in a problem discussion task that skews the conversation in a particular direction. Although the ecological validity of the task was strong, the types of linguistic patterns may vary depending on the specific social context in which they are derived. Sixth, although the LIWC has been validated (Pennebaker et al., 2007) and was used for the vast majority of studies on language and depression (e.g., Rude et al., 2004), it lacks the ability to interpret context. Finally, the community sample examined in this study was relatively healthy, so future research should examine more depressed populations.

Conclusion

In conclusion, the present study enhances understanding of the link between language and depressive symptoms through expanding the scope of research into adolescence, where the precursors of adult depression often arise (Pine, Cohen, Cohen, & Brook, 1999). It further provides clarification to this link through the addition of anxiety as a control given the strong comorbidity between anxiety and depression (Garber & Weersing, 2010) and through the examination of the role of gender given that emotions are socialized differently for boys and girls within peer relationships (Miller-Slough & Dunsmore, 2016; Zeman et al. 2013). Additionally, knowledge is advanced through the exploratory analyses of longitudinal outcomes. This study aids understanding of adolescent depression by demonstrating age-related differences in the relation between language and depression that mirror those of adult depression. The findings have the potential to inform preventative intervention programs for adolescent depression. That is, being aware of changes in language patterns (e.g., decrease in use of future tense) may alert caregivers, friends, and teachers to the presence of depressive symptoms. Finally, the present study provides future directions for research via examination of gender in the association between language use and depressive symptoms.

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Table 1

Means, Standard Deviations, and Ranges of Study Variables

	M	*SD*	*Range*
T1 Age (years)	12.65	1.04	10.33-15.92
T2 Age (years)	24.70	1.05	12.17-18.08
T1 CDI	7.66	6.08	0.00-33.00
T2 CDI	7.28	5.74	0.00-33.00
T1 MASC-10	12.44	5.28	0.00-26.00
T2 MASC	43.80	16.80	8.00-91.00
First-Person Singular	6.91%	2.75%	0.00%-16.19%
First-Person Plural	1.34%	1.23%	0.00%-9.31%
Second-Person	3.29%	1.91%	0.00%-9.49%
Third-Person Singular	2.56%	2.34%	0.00%-10.20%
Third-Person Plural	4.42%	0.66%	0.00%-4.42%
Past Tense	8.89%	3.63%	0.00%-8.89%
Present Tense	12.75%	3.01%	4.39%-28.29%
Future Tense	0.75%	0.76%	0.00%-4.27%
Positive Emotion Words	2.67%	1.51%	0.00%-8.45%
Negative Emotion Words	3.13%	1.45%	0.00%-8.51%
Sadness Words	0.16%	0.27%	0.00%-1.89%
Anger Words	0.66%	0.65%	0.00%-3.27%
Anxiety Words	0.40%	0.61%	0.00%-3.68%

Note. T1 = Time 1, T2 = Time 2, CDI = Child Depression Inventory, MASC = Multidimensional Anxiety Scale

Table 2

Correlations Among Age, Gender, Depression, Anxiety, and Pronoun Language Patterns

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1. T1 Age	-										
2. Gender	.08	-									
3. T1 CDI	.05	-.02	-								
4. T2 CDI	-.02	-.07	.60**	-							
5. T1 MASC -10	.03	-.22**	.35**	.19*	-						
6. T2 MASC	-.03	-.28**	.29**	.39**	.52**	-					
7. First-Person Singular	-.18*	-.20**	.17*	.16*	.05	.06	-				
8. First-Person Plural	.05	-.09	-.12	-.21**	-.07	-.04	-.11	-			
9. Second-Person	-.06	.03	.18*	.06	-.00	-.12	-.18*	-.26**	-		
10. Third-Person Singular	.14	-.08	-.05	.00	.04	.10	-.10	.02	-.23**	-	
11. Third-Person Plural	-.03	-.01	-.03	.00	.03	-.00	-.14	.06	-.10	-.00	-

Note. * $p < .05$, ** $p < .01$. T1 = Time 1, T2 = Time 2, CDI = Child Depression Inventory, MASC = Multidimensional Anxiety Scale

Table 3

Correlations Among Age, Gender, Depression, Anxiety, and Tense Language Patterns

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1. T1 Age	-								
2. Gender	.08	-							
3. T1 CDI	.05	-.02	-						
4. T2 CDI	-.02	-.07	.60**	-					
5. T1 MASC -10	.03	-.22**	.35**	.19*	-				
6. T2 MASC	-.03	-.28**	.29**	.39**	.52**	-			
7. Past Tense	.14*	-.20**	.03	.10	-.05	.11	-		
8. Present Tense	-.09	.01	.09	-.07	-.01	-.14	-.55**	-	
9. Future Tense	.01	-.07	-.16*	-.17*	.04	-.02	.00	-.15*	-

Note.* $p < .05$, ** $p < .01$. T1 = Time 1, T2 = Time 2, CDI = Child Depression Inventory, MASC = Multidimensional Anxiety Scale

Table 4

Correlations Among Age, Gender, Depression, Anxiety, and Emotion Word Language Patterns

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1. T1 Age	-										
2. Gender	.08	-									
3. T1 CDI	.05	-.02	-								
4. T2 CDI	-.02	-.07	.60**	-							
5. T1 MASC -10	.03	-.22**	.35**	.19*	-						
6. T2 MASC	-.03	-.28**	.29**	.39**	.52**	-					
7. Positive Emotion Words	-.12	.01	.12	-.07	.08	-.06	-				
8. Negative Emotion Words	.05	-.09	.13	.09	.12	.20*	-.01	-			
9. Sadness Emotion Words	-.02	-.10	.09	.03	-.14	-.12	.12*	-.03	-		
10. Anger Emotion Words	.03	-.12	-.07	-.08	.15*	.36**	.36**	.04	.01	-	
11. Anxiety Emotion Words	-.21**	-.12	.04	.02	.10	.34**	.34**	-.01	.01	-.08	-

Note. * $p < .05$, ** $p < .01$. T1 = Time 1, T2 = Time 2, CDI = Child Depression Inventory, MASC = Multidimensional Anxiety Scale

Table 5

Gender Moderation of Pronoun Use Predicting T1 and T2 Depression

	T1		*T2*	
	ΔR^2	*B*	ΔR^2	*B*
Step 1	.12***		.15***	
T1 MASC-10		.40***		.13***
Step 2	.08**		.06	
Gender		1.16		.52
First-Person Singular		.48**		.34*
First-Person Plural		.03		.65
Second-Person		.70**		.29
Third-Person Singular		.05		.02
Third-Person Plural		.09		.36
Step 3	.01		.78	
First-Person Singular x Gender		.36		.30
First-Person Plural x Gender		.58		.76
Second-Person x Gender		.23		.23
Third-Person Singular x Gender		.18		.40
Third-Person Plural x Gender		.50		.43

Note. * $p < .05$, ** $p < .01$, *** = .001. T1 = Time 1, T2 = Time 2, MASC = Multidimensional Anxiety Scale

Table 6

Gender Moderation of Tense Use Predicting T1 and T2 Depression

	T1		*T2*	
	ΔR²	*B*	*ΔR²*	*B*
Step 1	.12***		.15***	
T1 MASC-10		.40***		.13***
Step 2	.05*		.03	
Gender		1.03		.54
Past Tense		.46		.18
Present Tense		.33*		.02
Future Tense		-1.15*		-1.25*
Step 3	.01		.01	
Past Tense x Gender		-.30		.41
Present Tense x Gender		.15		.28
Future Tense x Gender		-.02		.34

Note. * $p < .05$, ** $p < .01$, *** = .001. T1 = Time 1, T2 = Time 2, MASC = Multidimensional Anxiety Scale

Table 7

Gender Moderation of Positive and Negative Emotion Word Use Predicting T1 and T2 Depression

	T1		*T2*	
	ΔR^2	*B*	*ΔR^2*	*B*
Step 1	.12***		.15***	
T1 MASC-10		.40***		.13***
Step 2	.01		.01	
Gender		.80		.53
Positive Emotion Words		-.07		-.20
Negative Emotion Words		.38		.08
Step 3	.03		.03*	
Positive Emotion x Gender		1.10*		.84
Negative Emotion x Gender		-.76		-1.36*

Note. * $p < .05$, ** $p < .01$, *** < .001. T1 = Time 1, T2 = Time 2, MASC = Multidimensional Anxiety Scale

Table 8

Gender Moderation of Specific Negative Emotion Word Use Predicting T1 and T2 Depression

	T1		*T2*	
	ΔR²	*B*	*ΔR²*	*B*
Step 1	.12***		.15***	
T1 MASC-10		.40***		.13**
Step 2	.04		.01	
Gender		.83		.40
Anger Words		-1.19		-.70
Anxiety Words		-.07		.04
Sadness Words		3.50*		.43
Step 3	.03		.03	
Anger Words x Gender		.14		-.35
Anxiety Words x Gender		3.29*		3.32*
Sadness Words x Gender		2.03		2.92

Note. * $p < .05$, ** $p < .01$, *** = .001. T1 = Time 1, T2 = Time 2, MASC = Multidimensional Anxiety Scale

Figure 1

Interaction of Gender and Positive Emotion Words Predicting Time 1 Depression

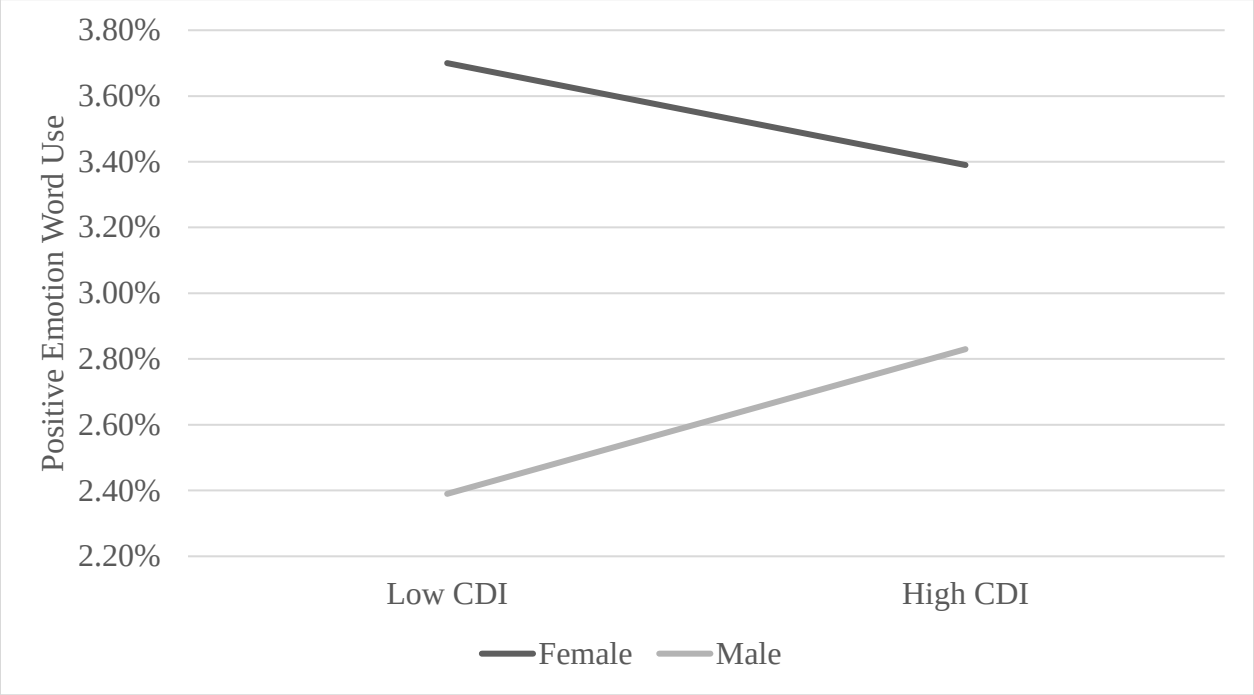


Figure 2

Interaction of Gender and Negative Emotion Words Predicting Time 2 Depression

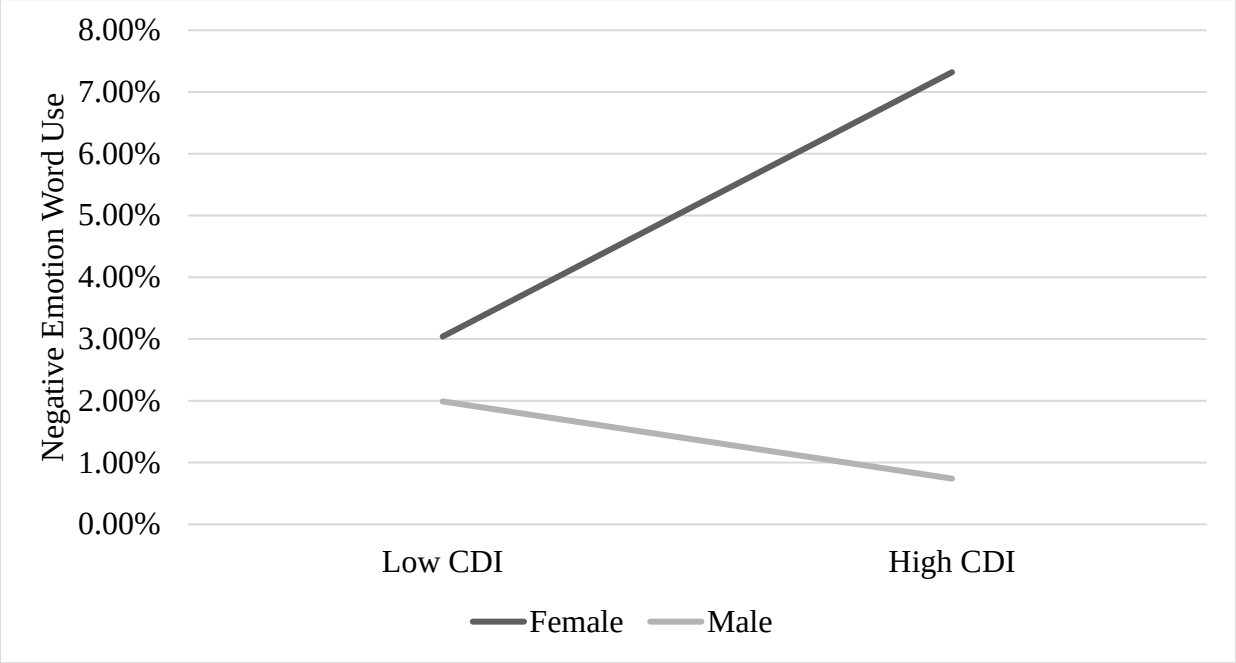


Figure 3

Interaction of Gender and Anxiety Word Use Predicting Time 1 Depression

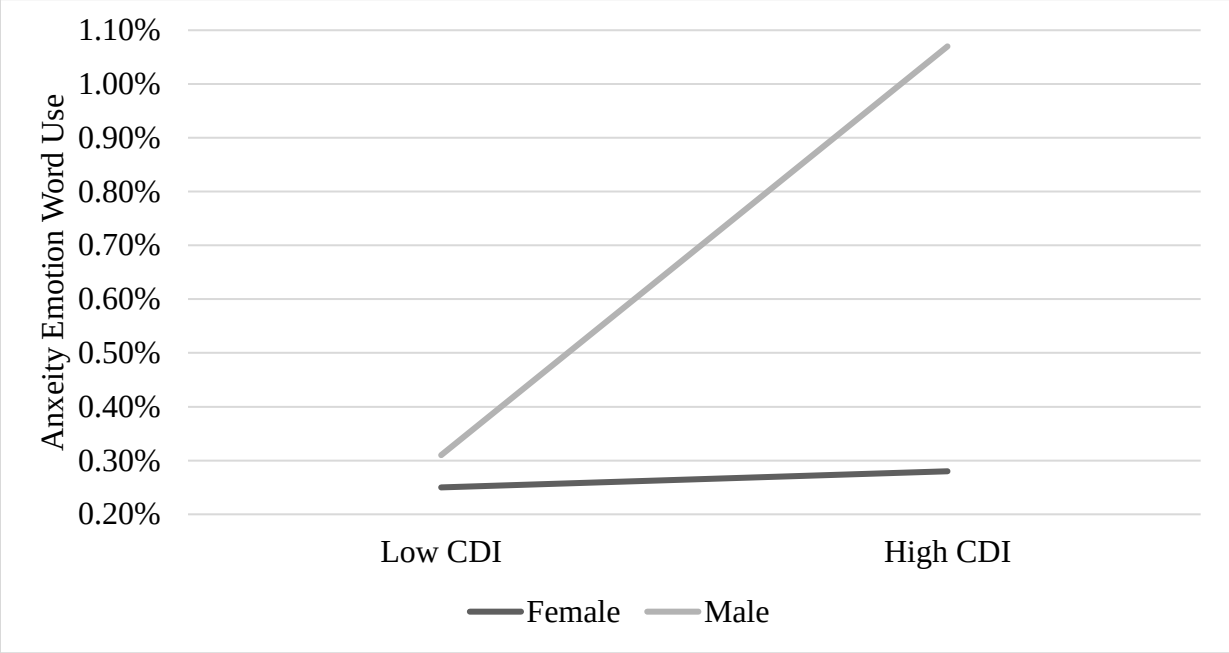
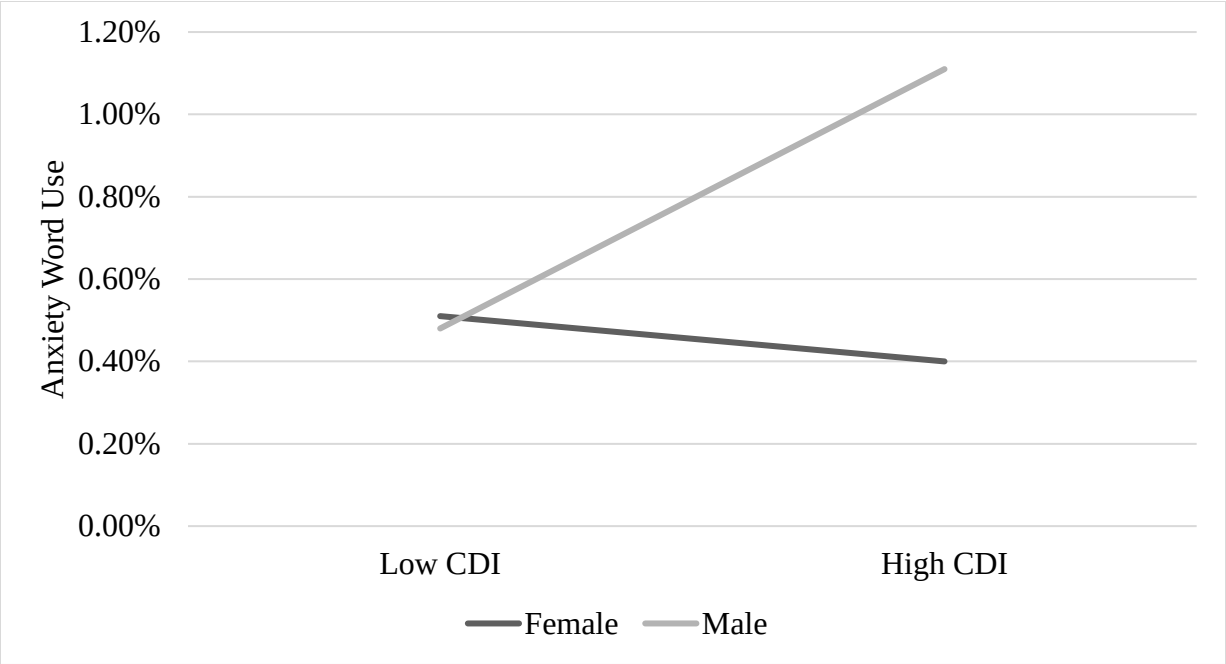


Figure 4

Interaction of Gender and Anxiety Word Use Predicting Time 2 Depression



Appendix

1. Time 1 Adolescent Assent Script

2. Time 2 Adolescent Assent Script

3. Discussion Task Instructions

4. Children’s Depression Inventory

5. Multidimensional Anxiety Scale for Children-10

6. Multidimension Anxiety Scale of Children

T1 Adolescent Assent Script

Thank you for your interest in our project. I am going to tell you a little bit about the project we are doing and ask that you help us out with it.

Your participation in this project is your choice. Even though your parents have given you permission to help us out, you can still choose not to participate. If you decide to participate, you can stop at any time without any consequences.

If you agree to help us out, we will ask you some questions about your feelings and experiences with friends. We will also have you and your friend do a task together that will involve talking to each other about a problem you pick to discuss. We will be asking you these questions and having you do this task so we can learn more about children's feelings and their friendships. We will read all the directions and questions to you. You will tell us your answers and we will write them down for you. Please answer each question as truthfully as possible. Remember that there are no right or wrong answers. If you do not want to answer a question because it makes you feel uncomfortable, please tell me and you may skip it. Your answers and your friends' answers to the questions today are personal and private. Please do not talk about your answers with your friend or ask your friend about his or her answers when we are finished. If you have a question or feel confused at any point, feel free to stop and ask.

All of your answers will be private which means that they will not be shared with anyone unless you tell us you are feeling really bad. If you do tell us this, then we will let a parent know so that someone can help you feel better. Your name will not be on your paper, and we will be the only ones to will see your answers.

T2 Adolescent Assent Script

Thank you for your interest in our project. I am going to tell you a little bit about the project we are doing and ask that you help us out with it.

Your participation in this project is your choice. Even though your parents have given you permission to help us out, you can still choose not to participate. If you decide to participate, you can stop at any time without any consequences.

If you agree to help us out, we will ask you some questions about your feelings and experiences with friends and have you complete a 5-minute computer task. We will be asking you these questions and having you do this task so we can learn more about adolescents' feelings and their friendships.

We will read all the directions and questions to you. You will tell us your answers and we will write them down for you. Please answer each question as truthfully as possible. Remember that there are no right or wrong answers. If you do not want to answer a question because it makes you feel uncomfortable, please tell me and you may skip it. Your answers to the questions today are personal and private. If you have a question or feel confused at any point, feel free to stop and ask.

All of your answers will be private which means that they will not be shared with anyone unless you tell us you are feeling really bad. If you do tell us this, then we will let a parent know so that someone can help you feel better. Your name will not be on your paper, and we will be the only ones to will see your answers.

Discussion Task Instructions

We are going to take a break from questionnaires now and you both are going to do an activity together. You both picked a problem earlier that you would like to talk to your friend about. You are going to have 15 minutes to talk to each other about your problems. You can use the whole time or a little less – take however long you need to discuss both of your problems. Just talk to one another as you normally would. When you are done talking about your problems, you can talk about something else or do these word activities. I will be here the whole time, but I won't interrupt your conversation. I'll let you know when 15 minutes are over.

First, we will do a quick warm-up. I want you both to tell each other about your favorite movie. Tell me when you are done talking.

Good job. Now you can talk to each other about the problems you picked. Remember, just talk to each other like you normally would. I will let you know when 15 minutes are over.

Child Depression Inventory

*Pick the sentence that describes you **best** for the past two weeks.*

Item 1 □ I am sad once in a while. □ I am sad many times. □ I am sad all the time.	Item 15 □ I have to push myself all the time to do my schoolwork. □ I have to push myself many times to do my schoolwork. □ Doing schoolwork is not a big problem.
Item 2 □ Nothing will ever work out for me. □ I am not sure if thing will work out for me. □ Things will work out for me ok.	Item 16 □ I have trouble sleeping every night. □ I have trouble sleeping many nights. □ I sleep pretty well.
Item 3 □ I do most things ok. □ I do many things wrong. □ I do everything wrong.	Item 17 □ I am tired once in a while. □ I am tired many days. □ I am tired all the time.
Item 4 □ I have fun in many things. □ I have fun in some things. □ Nothing is fun at all.	Item 18 □ Most days I do not feel like eating. □ Many days I do not feel like eating. □ I eat pretty well.
Item 5 □ I am bad all the time. □ I am bad many times. □ I am bad once in a while.	Item 19 □ I do not worry about aches and pains. □ I worry about aches and pains many times. □ I worry about aches and pains all the time.
Item 6 □ I think about bad things happening to me once in a while. □ I worry that bad things will happen to me. □ I am sure that terrible things will happen to me.	Item 20 □ I do not feel alone. □ I feel alone many times. □ I feel alone all the time.
Item 7 □ I hate myself. □ I do not like myself. □ I like myself.	Item 21 □ I never have fun at school. □ I have fun at school once in a while. □ I have fun at school many times.
Item 8 □ All bad things are my fault. □ Many bad things are my fault. □ Bad things are not usually my fault.	Item 22 □ I have plenty of friends. □ I have some friends but I wish I had more. □ I do not have any friends.

Item 10 □ I feel like crying every day. □ I feel like crying many days. □ I feel like crying once in a while.	Item 23 □ My schoolwork is alright. □ My schoolwork is not as good as before. □ I do very badly in subjects I used to be good in.
Item 11 □ Things bother me all the time. □ Things bother me many times. □ Things bother me once in a while.	Item 24 □ I can never be as good as other kids. □ I can be as good as other kids if I want to. □ I am just as good as other kids.
Item 12 □ I like being with people. □ I do not like being with people many times. □ I do not want to be with people at all.	Item 25 □ Nobody really loves me. □ I am not sure if anybody loves me. □ I am sure that somebody loves me.
Item 13 □ I cannot make up my mind about things. □ It is hard to make up my mind about things. □ I make up my mind about things easily.	Item 26 □ I usually do what I am told. □ I do not do what I am told most times. □ I never do what I am told.
Item 14 □ I look ok. □ There are some bad things about my looks. □ I look ugly.	Item 27 □ I get along with people. □ I get into fights many times. □ I get into fights all the time.

Note. Item 9, which pertains to suicide, was omitted.

MASC-10

	Never true about me	Rarely true about me	Sometimes true about me	Often true about me
1. The idea of going away to camp scares me.	0	1	2	3
2. I'm afraid that other kids will make fun of me.	0	1	2	3
3. I try to stay near my mom or dad.	0	1	2	3
4. I get dizzy or faint feelings.	0	1	2	3
5. I feel restless and on edge.	0	1	2	3
6. I feel sick to my stomach.	0	1	2	3
7. I get nervous if I have to perform in public.	0	1	2	3
8. Bad weather, the dark, heights, animals, or bugs scare me.	0	1	2	3
9. I check to make sure things are safe.	0	1	2	3
10. I feel shy.	0	1	2	3

Multidimensional Anxiety Scale for Children

This questionnaire asks you how you have been thinking, feeling, or acting recently. For each item, please circle the number that shows how often the statement is true for you. If a sentence is true about you a lot of the time, circle 3. If it is true about you some of the time, circle 2. If it is true about you once in a while, circle 1. If a sentence is not ever true about you, circle 0. Remember, there are no right or wrong answers, just answer how you have been feeling recently.

	Never true about me	**Rarely true about me**	**Sometimes true about me**	**Often true about me**
1. I feel tense or uptight	0	1	2	3
2. I usually ask permission	0	1	2	3
3. I worry about other people laughing at me	0	1	2	3
4. I get scared when my parents go away	0	1	2	3
5. I keep my eyes open for danger	0	1	2	3
6. I have trouble getting my breath	0	1	2	3
7. The idea of going away to camp scares me	0	1	2	3
8. I get shaky or jittery	0	1	2	3
9. I try to stay near my mom or dad	0	1	2	3
10. I'm afraid that other kids will make fun of me	0	1	2	3
11. I try hard to obey my parents and teachers	0	1	2	3
12. I get dizzy or faint feelings	0	1	2	3
13. I check things out first	0	1	2	3
14. I worry about getting called on in class	0	1	2	3
15. I'm jumpy	0	1	2	3
16. I'm afraid other people will think I'm stupid	0	1	2	3
17. I keep the light on at night	0	1	2	3
18. I have pains in my chest	0	1	2	3

19. I avoid going to places without my family	0	1	2	3
20. I feel strange, weird, or unreal	0	1	2	3
21. I try to do things other people will like	0	1	2	3
22. I worry about what other people think of me	0	1	2	3
23. I avoid watching scary movies and TV shows	0	1	2	3
24. My heart races or skips beats	0	1	2	3
25. I stay away from things that upset me	0	1	2	3
26. I sleep next to someone from my family	0	1	2	3
27. I feel restless and on edge	0	1	2	3
28. I try to do everything exactly right	0	1	2	3
29. I worry about doing something stupid or embarrassing	0	1	2	3
30. I get scared riding in the car or on the bus	0	1	2	3
31. I feel sick to my stomach	0	1	2	3
32. If I get upset or scared, I let someone know right away	0	1	2	3
33. I get nervous if I have to perform in public	0	1	2	3
34. Bad weather, the dark, heights, animals, or bugs scare me	0	1	2	3
35. My hands shake	0	1	2	3
36. I check to make sure things are safe	0	1	2	3

37. I have trouble asking other kids to play with me	0	1	2	3
38. My hands feel sweaty or cold	0	1	2	3
39. I feel shy	0	1	2	3