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The Associations between Self-Deception, Depressive Mood, and Attachment Dimensions with Linguistic Inquiry and Word Count

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ABSTRACT: This study aims to examine the relationships between depressive mood, self-deception, and attachment dimensions by using language style of individuals. Participants (N=41) were asked complete an implicit association task, Beck depression scale, experiences in close relation scale. Besides, they were also asked to write down a passage, in which they should have intentionally produced an obvious lie for themselves. Finally, they were asked to report their memory related to the school life. Following previous studies on language style of lying linguistic components were excluded using Linguistic Inquiry and Word Count. Analyses yielded that there was no significant differences in language style for both actual memory notes and intentionally lying conditions for people with low depressive mood (e.g., t-first-person singular (38)=.69, ns). However, there were significant differences between actual memory notes and lying conditions for participants with high depressive mood (e.g., t-first-person plural (38)=3.69, $p<.01$), signifying that people with depressive mood did not show lying tendency in their actual memory notes, however, this was not the case for people with lower levels of depressive moods. Results of this study confirmed the idea that depressive mood may shadow defence mechanisms like self-deception and people with higher levels of depressive mood would perform lower levels of self-deception. This tendency could also be observed at linguistic dimensions they produced.

KEYWORDS*:* Depressive Mood, Self-Deception, Attachment, Linguistic Inquiry and Word Count.

INTRODUCTION

"THE WORD THAT PEOPLE GENERATE IN THEIR LIFETIMES ARE LIKE FINGERPRINTS"

JAMES W. PENNEBAKER

Over hundred years ago Sigmund Freud (1901) coined the phrase, ''Slips of tongue.'' He suggested that person's real feelings sometimes leak out and they can be seen through subtle speech error. Generally, it occurs when a person is thinking different than what he/she is talking about. On the other hand, Pennebaker (2004) assumed that using words serve as window into people to figure out their emotion and cognitive projections. Although, all people have own linguist style, Pennebaker and King (1999) examined 1200 student showed different language use that is accurately be correlated with their alcohol use, physical health, emotion and psychological mood.

In order to provide an efficient method for analyzing linguistic styles that serve as windows into people's emotional and cognitive thinking, LIWC was modeled in 1993 (Tausczik & Pannebaker, 2010). Analyzing linguistic style that allowed for word counting is based on text analyzing application as called Linguistic Inquiry Word Count software program (LIWC). The second version, LIWC2001, updated the original application with an expanded dictionary and a more modern software design (Pennebaker, et., al 2001) The idea was developed by language use, especially pronouns, articles, prepositions. This are words called as function words that can service to understand people's emotions and cognitive process. The program was designed to analyze transcripted or written text on a word by word to calculate the percentage of words that calculate in over 70 language dimensions (Pennebaker, et., al. 2007). The categories included negative and positive emotions (e.g., happy, love, lonely, angry) causal words and insight words (e.g., realize, understand, because and reason).

Self-Deception and Attachment Orientations

Self-deception can be conceptually defined as a condition of changing or suppressing of the reality in a positive manner in order to protect one's own self-concept. In other words, self-deception includes biased information search strategies, biased interpretive processes, and inhibiting the emotions that would otherwise create negativity in individual's mood (Hippel & Trivers, 2011). Studies have shown that healthy individuals, compared to people with high-level depressive mood, have found to use this strategy to maintain positive self-concept and in turn, preserve their psychological mood. Besides, cumulative research has also suggested that

attachment orientations (i.e., attachment anxiety and avoidance) are also related to this distortion tendency. Specifically, high attachment avoidance was associated with increased deception in general, self-deception in specific defines an individual in depressive mood as an individual that is in a desperate mood against (Gillath, et., al. 2010). However, previous work has not empirically examined whether people with higher depressive mood deceit themselves less than those with lower levels of depressive moods. Besides, the question of how attachment related dimensions could moderate this relationship has not been tested.

Self-Deception and Depressive Mood

Most of us are no stranger to emotions such as sadness, pessimism, discouragement or hopelessness that occur against circumstances independent or dependent to us. However, when depressive mood springs it creates queasy and involuntary emotions, but this may not continue for a long time. Depressive mood as a circumstance of being that results from the tension between expectations and reality (Pyszczynski, et.,al, 1987). As the individual craves to be a valuable and beloved, strong and loving person, being aware of the reality that his/her personality cannot reach that level results in him/her experience depressive mood. Nevertheless, Depressive mood helps the individual face emotions and thoughts he/she would avoid in normal circumstances. Lower level of depressive mood that enables the individual face the realistic circumstance prevents him/her from spending energy for unrealistic plans (Taylor, et., al, 2000).

Prior works have established a relationship between self-deception and depressive mood (e.g., Ingram & Smith,1984; Taylor & Brown, 1988). Specifically, researchers have found that concept of positive illusion protects against depressive mood and also preserve individuals' mental health. That is individuals supposedly are least depressive, if they accept responsibility for positive outcome and deny responsibility negative outcomes. If individuals are prone depressive mood would generally exhibit higher degree of realism about their life conditions. Campbell and Fehr (1990) consistently examined that there is a negative correlation between depressive mood and self-deception. On the contrary, Taylor and Gollwitzer (1995) consistently demonstrated that although positive illusion encourage self-esteem and generate positive mood in short-term period, inevitably prepare individuals for future failure in the long-term period.

In addition, the literature has consistently demonstrated that individuals who are lower-level depressive are more balanced in self-perception and tend to be more realistic (e.g., Coyne & Gatlieb 1983). Researcher found that non-depressive individuals consistently tend to exhibit positive bias in evaluation of reality. However, lower-level depressive individuals would tend to be more evenhanded and objective when making such evaluation (Hippel & Trivers, 2011)

Linguistic Style and Depressive Mood

Due to devise comprehensive text analytic strategies, many experiments have been carried out to analyze multiple psychological dimensions of speech and text. These experiments generally focused on phrases, thoughts and word choice (Pennebaker & King, 1999). However, for the first time, researchers are able to use computer software program (LIWC) to determine how words would reflect individual's psychological states.

Fabricated a story requires describing events that never exist. In other words, no one has a false story in the same way someone has true one. If constructing a false story, he/she has to make quest about how the real story could have occurred (Bond & Lee, 2005). Thus, inventing experience that never happened has to be require substantial linguist style differences that researchers might expect to see some evidence in several features of linguistic style. Verbal cues to deception can be detected in individual's statement such as, pronoun use, prepositions and conjunctions that give some evidence about linking to a number of emotional and cognitive outcomes (Vrij, et., al, 2007).

Stirman and Pennebaker (2001) have suggested that word usage in suicidal as compared to non-suicidal poets that showed increase of first person singular pronouns by suicidal poets. Thus, depression associated with major risk for suicide attempt. Word usage in depression as compared to healthy control groups that use more negative emotion words and I-words in their daily live routine. There was a primary reason for using I-word in higher level of depressive individuals. Depressive mood causes individual to look inward that increase self-focus associated with I-words (Rude, et., al, 2004)

The present works builds on these established findings by examining the extent to whether people with lower level of depressive individuals' deceit themselves less than those with higher levels of depressive individuals. This study aims to examine the relationships between depressive mood, self-deception, and attachment dimensions by using language style of individuals.

MATERIALS AND METHODS

Research Area and Samples

The area of this research is healthy individuals who are prone to suggestions between the ages of 18-24. Participants (N = 41) were students who were studying at undergraduate degrees. The participant group was composed of volunteers who were not diagnosed with depressive disorder or generalized anxiety disorder. The ethics committee approval was obtained by Nişantaşı University.

Socio-demographic Form

In the study, a socio-demographic form was used to obtain whether the participants had chronic illnesses, whether they used medication, whether they had psychiatric disorders, gender, educational status, marital status, and age.

The Experiences in Close Relationships- Revised (ECR-R)

The Experiences in Close Relationships-Revised (Ecr-r), developed by Fraley, Waller, and Brennan (2000), was used to measure participants' attachment anxiety (18 items) and attachment avoidance (18 items). It was found that the internal consistency of the avoidance dimension of the scale was .90 and the anxiety dimension was .86. (Selçuk et al., 2005). The test-retest reliability of the scale was determined as .82 for the anxiety dimension and .81 for the avoidance dimension.

Beck Depression Inventory (BDI)

In this study, the 21-item Beck Depression Inventory was used to evaluates symptoms of depression. Validity and reliability of BDI was adapted into Turkish by Hisli (1988). The inventory questions are scored on four different point as 0=least, 3=most. The lowest score on the scale is 0, the highest score is 63. The distribution between scores is evaluated as normal, mild, moderate and severe. The test-retest reliability of the scale was determined as .65.

The Implicit Association Test (IAT)

The implicit association test developed by Meites et., al., (2008) measures the reaction times of the participants to the questions by reflecting positive and negative visual stimuli on the computer screen. The IAT is a metric of response time that measures implicit associations between particular notions. For instance, notions such as 'unhappy' and 'sad' could be associated with depressed mood.' Participant response latency is then calculated and used as a proxy for the strength of implicit associations between categories. This measurement method shows how frequently and quickly the participants' selves and negative moods match. Participants are divided into moderate and low depressed mood according to the scores obtained from the measurements made with the inquiry software used to measure the mental representation of the depressed mood. In the study, high IAT score indicates low depressed mood as used by Meites et al. (2008). Meites et., al. showed that the psychometric properties of IAT were sufficient. Accordingly, the reliability coefficient of the depression IAT was found to be .87. In addition to that there was a negative correlation between the Implicit Association Test and negative mood (a high IAT score indicates a low depressive mood) ($r = .41$, $p < .001$).

Linguistic Inquiry and Word Count Software

LIWC was modeled by Pennebaker and Francis (1993). Analyzing linguistic style that allowed for word counting is based on text analyzing application as called Linguistic Inquiry and Word Count software program (LIWC). The second version, LIWC2001, updated the original application with an expanded dictionary and a more modern software design (Pennebaker, et., al 2001) The idea was developed by language use, especially pronouns, articles, prepositions. This are words called as function words that can service to understand people's emotions and cognitive process. The program was designed to analyze transcripted or written text on a word by word to calculate the percentage of words that calculate in over 70 language dimensions The categories included negative and positive emotions (e.,g., happy, love, lonely, angry) causal words and insight words (e.g., realize, understand, because and reason). The LIWC software program uses an internal dictionary of 4,500 words to classify words found in text files into over 70 categories. The categories include general descriptors, linguistic components, psychological processes, and non-psychological processes (Pennebaker, et., al 2007).

PROCEDURE

Each participant had an appointment to the experiment, and the experiment was conducted with only one participant at a time. Before the experiment, participants were informed about use of psychological recording equipment and the experiment with consent form. In the laboratory, light conditions were held constant, and the temperature was controlled at 20-23 Celsius Degree to minimize their effects on participants (Boucsein, 2012). Sessions are composed of four phases. In the first stage, the equipment to be used in the study was prepared and the background noise was minimized and fixed with a zero-time interval. In the second stage of the session, they were asked to write down a passage, in which they should have intentionally produced an obvious lie for themselves. Besides, they were also asked to report their memory related to the school life (e.g., *What were your expectations about university life?; Have you satisfied with your experience in the university?*). Following previous studies on language style of lying (Rude, et., al, 2004; Newman, et., al. 2003). Speech recordings were recorded using the Audacity 1.3 program. After the speaking sessions of the participants ended, the experiment was carried out by taking them to the previously prepared computer room for the Implicit Association Test (IAT). Finally, Transcription was done to convert the participants' speech recordings into written text to analyze with Linguistic Inquiry Word Count (LWIC) software. Each word is compared with the word group in the dictionary where linguistic classes are determined and divided into 72 linguistic dimensions in total. After the parsing, each word is calculated numerically in its own category and divided by the total number of words of the analyzed text to reach the total percentage of the word in the text. During data collection, an average of 40 minutes session was held with each participant.

RESULTS

In this section, the findings of the study are presented. Paired sample t-tests compared the language style in intentionally lying condition and participants' memory notes on their university life in terms of predefined linguistic components. Same analyses were conducted for participants (N = 41, female 21, male 20 Mean=22.55, SD=3.12) who are in high depressive moods group and low depressive mood group (based on IAT and BDI scores) separately.

Table 1. Descriptive statistics of basic linguistic dimensions used in all memory notes and lying conditions

Linguistic dimensions	*M*	*SD*
First Person Singular (e.g., I)	2.22	1.16
First Person Plural (e.g.,we)	0.15	0.23
Negative Words (e.g.,unhappy)	2.77	0.96
Positive Words (e.g., Happy)	3.80	1.86
Social Processes (e.g., friend)	7.73	2.14
Conjunctions	1.52	1.08

In Table 1, the participants used social words than other linguistic dimensions. Social words include words such as big brother, sister, relative, friend and togetherness.

Table 2. Zero- order correlations: between linguistic items and depressive mood

Linguistic Dimensions	Example	BDI	IAT
Positive Words	Happy, enjoy,	-.014	.119*
Negative Words	Unhappy, sad,	.235*	.084
First Person Singular	I, my, mine*	-.207*	.316*
First Person Plural	We, us, ours*	-.268*	.160*
Models		-.220*	-.036
Conjunctions	But, because	.032	.260*
Third Person Singular	She, he, it	-.106	.052
Second Person	you, yours	.188*	-.222*
Second Person Sing. Verb	you	.095	-.096
Third Person Sing. Verb		-.002	-.086
First Person Plural Verb		.016	-.156*
Second Person Plural	you	.356*	-.045
Second Person Singular	We, us, ours*	.084	.399*

In Table 2, a significant correlation was found between the depressive mood obtained from both the Beck Depression Inventory (BDI) and the Implicit Association Test (IAT) and the use of the first person singular ($r = -.21$, $p < .01$; $r= 32$, $p < .01$).

Table 3. Results of differences between two groups in memory and lying conditions

	CONDITION				
	Memory Note		Intentional Lying		
Linguistic Dimensions	M	SD	M	SD	t
1.First Person Singular	2,216	1,156	0,473	1,073	7,70***
2.First Person Plural	0,154	0,231	0,814	1,680	-2,39*
3.Second Person Plural	0,013	0,083	0,000	0,000	1,00
4.Third Person Singular	1,652	1,018	0,366	0,729	6,99***
5.Third Person Plural	0,371	0,411	0,136	0,432	2,36*
6.Models	1,517	1,084	1,751	1,922	-0,63
7.Conjunctions	7,731	2,142	7,301	3,508	0,68
8.Positive Words	3,805	1,861	5,643	2,805	-3,32**
9.Negative Words	2,768	0,956	1,503	1,920	3,80**

The Associations between Self-Deception, Depressive Mood, and Attachment Dimensions with Linguistic Inquiry and Word Count

The differences between the linguistic dimensions used by the participants in memory and lying conditions were compared with the two paired groups (paired-sample t test). It was found that the same participants differed in terms of different linguistic dimensions in two different conditions (memory and lying) in table 3. Accordingly, in memory conditions the participants more used first person singular ($t(38)=7,70$, $p <.001$), third person singular ($t(38)=7,70$, $p <.001$) and negative words than lying conditions. In addition to that signifying that people with depressive mood did not show lying tendency in their actual memory notes, however, this was not the case for people with lower levels of depressive moods.

In table 4, there is a positive relationship between anxious attachment and the frequency of usage of the third person singular while there is a significant positive relationship between avoidance and negative words. Furthermore, an expected relationship was found between the BDI and attachment dimensions. Specifically, the BDI was linear correlation with both attachment dimensions while non-linear correlation was found between IAT and attachment dimensions (Having a high score on the IAT indicates low depressive mood).

DISCUSSION

The data obtained from the study were tested with a series of statistical analyzes in order to find answers to the questions stated in the sub-problems. In the part one, the average values of the linguistic dimensions produced by the university students were found. In the second step, the correlations between the linguistic dimensions of the participants' depressive moods produced by Beck Depression Scale and Implicit Association Test were tested with correlation analysis, and the changes in the increase and decrease in depressive mood in the linguistic dimension were examined (Rude, et al.,2004). As a result, it was determined that there was a negative correlation between self-deception and depressive mood by examining the problem sentence of the research. In the first dimension of the study, the scores obtained regarding the linguistic values were calculated by removing the effects of the length of the speeches. Thus, it has been seen that the first -person singular is used more frequently than the first-person plural in speech contents.

In the second step, it was determined that there was a positive correlation between the depressive mood obtained by the BDI and IAT measurements and the use of the first person singular. The use of the first-person singular has shown high usage in memory condition. In the lying condition, the first-person singular was more used by the participants that had high depressive mood score from both BDI and IAT. In another result, the use of the first-person plural in memory condition did not change due to the depressive mood scores while the use of the first-person plural has shown high usage in lying condition. Buller, et., al. (1996) suggested that people in lying condition may avoid statements of ownership either to dissociate themselves from their words or due to a lack of personal experience. Similarly, the early study of Winer and Mehrabian found that participants who were in lying condition had lower first-person singular use compared to participants who were in memory conditions (as cited, Newman, et., al, 2003).

Three main lines have been followed in determining the fictional transference. First person singular, I (I-word), usage (used in the lie condition). This dimension was thought to be used specifically to emphasize the self. Another is the high amount of negative emotion words (hate, sadness, anger, anxiety, etc.) and the last low amount of positive emotion words (joy, happiness, etc.). These linguistic dimensions were composed entirely in the light of data obtained from previous controlled studies (Rude, & McCarthy, 2003; Stirman & Pennebaker 2001; Rude, Krantz & Rosenhan, 1988). Skillicorn & Lamb (2013), examined the use of the first person singular in courtrooms. Answering the questions posed by the judge in the first person (I-word) is as expected in the answers to the questions "did you commit this crime" or "where were you on the night of the crime." As a result of the study: While it was observed that the use of the first-person singular was high in correct answers, it was observed that the word "we" was frequently repeated in lying answers. In the formation of this situation, it was thought that the passive use of non-awareness was preferred in order to display passive orientation in the perception of time and space of lying conditions. Thus, it is considered that the content transmitted with the use of the first-person singular occurs when it is experienced first-hand in time and space.

Researchers have indicated that there are language using differences in self-deception at both lower level of depressive and higher level of depressive. Linguistic patterns of depressed and depression prone participations in the context of an essay task. They were asked to report, ‘’write about your deepest thoughts and feelings about coming to college.’’ (Rude, et., al, 2004). Researchers were just interested in using of first-person singular pronouns by depressive persons. That is when people become depressed, they tend to focus on their own emotions that would be associated with higher notes of self-referencing pronouns (e.g., I, me, mine). Conversely, linguistic patterns of self-deception is associated with we-words, fewer self-reference and negative emotions words (Skillicorn & Lamb,2013). Newman, et., al, (2003) consistently demonstrated that the use of the first-person singular is a subtle indicator of ownership of a statement. That is deceptive individuals would avoid statement of ownership if they don’t have personal experience. They tend to distant themselves from their tale in using of plural first person pronoun.

Lower-level depressive individuals’ deceit themselves as using defensive strategy that involve the denial of reality, this tendency could be observed at linguistic dimensions they produced (Skillicorn & Lamb, 2013). Specifically, we aimed to explore language style in intentionally lying condition and participants’ memory notes on their university life in terms of predefined linguistic components. Same analyses were conducted for participants who are in high depressive moods group and low depressive mood

group (based on IAT and BDI scores).

Some methodogical limitations of these studies should be consider. First limitation, while the word used in memory condition was scored on the dictionary (LWIC), the use of the negatively assigned word may have been positive (e.g., "it was something crazy"). Future research could consider the exact meaning of words before the words are scored on the dictionary. Second limitation, it is known that there may be semantic differences, but only word usage rates are discussed in this study. It is thought that it will be an important initiative for the related literature to examine these semantic differences alone. Third, In the study the relationship between depressive mood and self-deception is limited to university students, future research could consider the sample group consisting of clinically diagnosed depression patients in order to reveal the significance between self-deception and depressive mood more clearly.

CONCLUSION

Results of this study confirmed the idea that depressive mood may shadow defense mechanisms like self-deception and people with higher levels of depressive mood would perform lower levels of self-deception. This tendency could also be observed at linguistic dimensions they produced. As a result of these findings obtained in the study, it is thought that it will contribute to the understanding of cognitive processes in depressive mood. It has been observed that while the relatively negative and warm information encountered in daily life should be cooled and turned into an acceptable information by the self, people with high depressive mood cannot actively use these protective processes. As a result of the research findings, the strength of the study is to focus on the differences between memory conditions and lying conditions by calculating the differences between individuals' own behaviors, rather than making inferences based on the results of previous studies. Secondly, the subject of memory conditions used in this study differ in terms of content with previous studies, it was aimed to examine only the language components of the subject in question. In summary, the findings of this research are expected to contribute to the literature about relationship between depressive mood, self-deception, and attachment dimensions by using language style of individuals.

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