

JUDGMENT OF SUB-CLINICAL DEPRESSION IN PRIVATE AND PUBLIC
SELF-DESCRIPTIONS

By

Aubrey Joy Rodriguez

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Dr. Matthias Mehl
Department of Psychology

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Judgment of Sub-clinical Depression in Private and Public Self-Descriptions

Aubrey J. Rodriguez

University of Arizona

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Abstract

Recent research demonstrates that personality traits can be judged with relatively high levels of accuracy from a variety of domains, but little research has focused on how different contexts (e.g. private and public) affect accuracy within a single domain (e.g. writing). To examine the accuracy of judgments of subclinical depression based on private and public self-descriptions, 57 target participants wrote two short essays: one in a private context (i.e. personal diary) and one in a public context (i.e. online journal/blog). Eight naïve personality judges then rated target participants' levels of depression on the basis of these essays. Raters achieved substantial and comparable levels of accuracy in assessing depression across both contexts, but lens model analyses revealed that judges relied on different linguistic cues in the two contexts. These results suggest that self-descriptive writing samples such as online blogs and personal diaries can provide diagnostic information for judging depression regardless of their private/public nature.

Aspects of everyday life provide an array of information that is revealing, yet informative about one's personality. Recent research suggests that aspects of people's physical and social environments such as their bedrooms (Gosling et al. 2002), emails (Gill, Oberlander, & Austin, 2004), and social interactions (Mehl, Gosling, & Pennebaker, 2006) provide information that facilitates accurate personality impressions. One limitation of this research is uncertainty about the extent to which findings about personality impressions based on a single domain can generalize to multiple domains. Research suggests that contexts vary along several important psychological dimensions (c.f. Snyder & Ickes, 1985; Vazire & Gosling, 2004), but these psychological dimensions within a single domain are rarely examined in the same study. The purpose of the current study is to examine how contextual dimensions in one naturally-occurring domain affect the accuracy of personality impressions.

One way that people naturally judge the personality of others is through forming impressions on the basis of self- descriptions. While self-description can take many forms, such as giving a verbal introduction about the self, writing is one common form. An estimated 1.9 million active (i.e. recently updated) personal blogs exist on the Internet, a demonstration of the prevalence and availability of writing samples about the self ("NITLE Blog Census", 2008). Besides being highly prevalent, writing samples are also related to personality characteristics. Pennebaker and King (1999) found that personality traits were related to linguistic consistencies in writing samples in which the writing topic was directed (i.e. thoughts and feelings about the college experience) or undirected (i.e. stream of consciousness). Specifically, Openness to Experience was related to lower linguistic immediacy (e.g. those in the present tense and first-person singular voice), and higher rates of word use regarding the social past (e.g. past tense, social words, and positive emotion words). More recently, Fast and Funder (2008) found that the

use of words related to certainty (e.g. sure, exact) were related to higher levels of assertiveness, introspectiveness, and intelligence. Individuals who used sexuality-related words were likely to be more extraverted, dramatic, and unconventional. These results suggest that the written self-descriptions people provide may be systematically related to their personalities, such that these writings may also provide personality-relevant information to others.

Within the person perception literature, writing samples are a common domain used in forming personality impressions. In email writing samples, Gill, Oberlander, and Austin (2004) found significant levels of target-judge accuracy for Extraversion, but a negative correlation for ratings of Neuroticism. The researchers argue that, despite the use of words related to Neuroticism within the email writing samples, judges may be using the wrong linguistic information to form their impressions of the trait. Holleran and Mehl (in press) used stream of consciousness writing samples and found accuracy correlations that ranged from .29 for Openness to Experience to .50 for Conscientiousness. They argue that stream of consciousness writing provides a context that facilitates the accurate judgment of both private traits (e.g. Neuroticism) and public traits (e.g. Extraversion). Based on the research on person perception in the writing domain, we suggest that self-descriptive writing provides a domain that facilitates accuracy for personality traits globally. One alternative explanation is that writing samples provide a domain that facilitates accurate judgment of personality traits due to the variation in the degree to which they are private or public. For example, while personal statements for job applications and letters written to close friends or lovers are both written self-reflections, they will provide different types of personality-relevant information as a function of their audience.

Theoretically, person perception contexts vary along several dimensions such as how structured or unstructured, private or public, or evaluative the information is available within a

context (Ickes & Snyder, 1985; Letzring, Wells, & Funder, 2006; Vazire & Gosling, 2004). The private and public nature of contexts provides especially diagnostic information about the accuracy of personality judgments because they also encompass social desirability concerns. In public contexts, impression management occurs because other people are present. In private contexts, social desirability is less of a concern because people (or at least strangers) are not present to evoke impression management behavior. The presence and influence of an audience encourages the expression of an ideal self, which conveys who the individual would like to be and communicates to his audience the way he would like to be regarded (Goffman, 1959). The discrepancy between the ideal self and the actual self may decrease accuracy to the extent that individuals' questionnaire self-reports reflect their actual self while the ideal self is publicly presented. It can then be predicted that private contexts would allow for greater accuracy than public contexts because having fewer self-presentational concerns would allow people to more freely describe themselves in a writing context.

Traits also vary in the extent to which they are expressed in domains. Properties of personality traits, such as social desirability and observability, are often discussed as affecting the ways that traits are expressed (John & Robins, 1993). Since our goal is to test the extent to which context matters in person perception, we chose a prototypical private trait – sub-clinical depression. In one recent study, naïve judges rated targets' level of sub-clinical depression after listening to approximately 2 days of short 30 second sound clips (Mehl, 2006). Raters, however, achieved little accuracy and the research revealed that judges relied on cues such as spending more time alone and talking less, which had no correspondence to depression. The findings also suggest that accuracy differs for levels of depression such that moderate to high levels of depression were more accurately judged than low levels of depression. One interpretation of

these findings is that depression is not an easily judged trait. Or it may be that sound clips of natural environments do not provide a good domain to study person perception. The same concern may exist regarding the general quality of the writing domain. Thus, one of the goals of the current study is to examine whether writing is a good domain to study person perception, specifically for the trait of subclinical depression. Furthermore, because Mehl (2006) shows an effect of level of depression on accuracy of impressions of the trait, the present study also examines whether this effect persists in impressions from writing samples, in which relevant linguistic cues may be more salient.

The purpose of our study was to examine the accuracy of perceptions of depression across multiple writing contexts. Our first goal was to determine if depression is accurately perceived from writing samples. The second goal was to test two competing predictions that the writing domain provides good information to judge depression or that accuracy of depression would differ across public and private writing contexts. The third goal was to examine if perceptions of depression differed across levels of depression.

Finally, our fourth goal was to examine what linguistic cues were used in making ratings of depression. Using a Brunswik lens model analysis (Brunswik, 1956), we investigated the validity and utilization of linguistic cues in the construction of judges' impressions of target participants' depression. Observable cues (e.g. more sadness words) are valid to the extent that they correspond with the targets' actual position on the given trait or construct (e.g. self-reported depressive symptoms). Judges' cue utilization refers to the correspondence between the observable cue (e.g. more sadness words) and judge perceptions of the targets' position on the trait or construct (i.e. perceived depression). In the current study, we addressed cue validity and

utilization as well as accuracy, the degree of convergence between the two, using linguistic cues derived from analysis of the contents of the writing samples.

To test these predictions, two groups of naïve judges read writing samples from a group of target participants. Each target participant wrote self descriptions as if describing themselves in a personal diary (i.e. private writing context) or blog (i.e. public writing context).

Method

Participants

Fifty-seven target participants (49 female; mean age = 18.74, SD = 1.72 years) participated in the study for course credit. A team of eight research assistants (2 male, 6 female) served as naïve personality judges. The judges had no prior contact with the data and did not know any of the targets.

Procedure

Each target participant completed two twelve-minute writing exercises, typed directly into a computer, on the topic “Writing About Who You Are”. Specifically, participants were asked to write continuously in response to the following prompt (alternative wording for the online blog prompt in brackets):

Who are you? Describe yourself as if you were writing about yourself in a personal diary [in an online journal or blog]. How would you describe your personality to yourself [to others]? Don't plan out carefully what you are going to write about; just write your thoughts as they naturally come to mind. Don't worry about spelling or grammar. Just write as freely and unrestrained as possible.

Again, write about who you are as if you were describing your personality to yourself in a personal diary [an online journal or blog].

The order in which the two essay prompts were completed was counterbalanced across participants. Participants gave consent for their essays to be used in follow-up studies, and were assured their personal information would remain private.

Assessment of targets' depression

Target participants also completed a battery of questionnaires, including the Beck Depression Inventory (BDI; Beck et.al., 1961), a 21-item scale evaluating the presence and severity of depressive symptoms and behavior. BDI scores within the sample ranged from 0 – 49 (M = 6.67, SD = 7.55). Cronbach's alpha for the BDI in the current study was .90. Based on the work of Lasa and colleagues (2000) on depression in non-medical populations, we divided the sample into participants who scored 13 or greater into a “high depressed” sub-sample ($n = 5, 3$ females) and participants who scored less than 13 into a “low depressed” ($n = 52, 46$ females) sub-sample.

Assessment of perceptions of depression

Eight naïve personality judges were divided into two groups of four judges each (with one male and three females in each team). Each group of judges evaluated one of the two essay responses (i.e. personal diary entries only or public blog entries only), to prevent recognition of essay authors based upon the content or style of their two essay samples. Essays were randomized and the judges were instructed to read each essay and record their impressions of the target participant's level of depression. Specifically, judges answered the single-item measure of depression “I see the person as someone who is depressed” on a 7-point Likert scale that ranged from 1 (strongly disagree) to 7 (strongly agree). A global measure of perceived depression is

suitable for the assessment of impressions of depression in zero-acquaintance paradigms because the symptoms and behaviors assessed by the BDI (e.g. weight loss, insomnia or hypersomnia, etc.) are inaccessible to individuals with little personal or clinical knowledge of the target and because it corresponds well to how the construct is naturally perceived by lay persons. This measure yielded high levels of inter-judge consensus (ICC [2,k]) in both the private diary entries (.87) and public blog entries (.78). These consensus measures are reported in Table 2. To evaluate cue utilization within the lens model framework, we examined the relationship between judges' global ratings of target depression and the linguistic categories derived from the LIWC analysis.

Linguistic analysis of writing samples

Target participants' essays were submitted to Linguistic Inquiry and Word Count (LIWC; Pennebaker, Francis, & Booth, 2001) a text analysis program which provides a computerized word count for psychologically-relevant linguistic categories. Linguistic categories relevant to the assessment of subclinical depression, including positive emotion words and negative emotion words, were examined for their relationship to actual levels of target depression (as assessed by the BDI). These measures indicate the cue validity of each linguistic category. Base rates for linguistic cues and significant differences in base rates between the two contexts are reported in Table 1. The word count was significantly different between contexts, with target participants writing more in the private diary condition than the public blog condition. Additionally, positive emotion and positive feeling words were used more often in public blog essays, and negative emotion words were used more often in private diary essays. Finally, target participants used more words that indicated cognitive mechanisms (e.g. know, think, cause) in the private diary

essays than in the public blog essays. These differences in cue base rates indicate systematic differences between the contexts, and suggest that the context manipulation was successful.

Results

Consistent with our first hypothesis, the accuracy of lay impressions of depression was substantial across both essay prompts ($r = .52$). We examined the competing predictions that (a) the writing domain generally provides high quality information or (b) writing contexts provide good information as a function of their private or public nature. We found that the accuracy of impressions was similar for the online blog essay prompt ($r = .57$) and for the private diary essay prompt ($r = .49$), suggesting that the writing domain is a high-quality domain for person perception generally, regardless of whether the writing context was private or public. Consistent with our third hypothesis, targets' level of depression (i.e. high or low) influenced accuracy of judge impressions. For high-depressed participants, judges' accuracy was significantly higher for the online blog essay prompt than for the private diary prompt ($r = .92$ vs. $r = .62$, $p < .01$). However, an opposite trend of results emerged among low-depressed targets. The accuracy of the judges' impressions of depression was (descriptively) higher in the private diary essay condition than in the public blog essay condition ($r = .31$ vs. $r = .24$). Additionally, across both essay contexts, judges were more accurate for targets in the high-depressed group than the low-depressed group ($r = .77$ vs. $r = .27$, $p = .03$).

The validity and utilization correlations for linguistic cues used in the essays are presented in Tables 3 and 4. For the private diary essays (see Table 3), third-person pronouns (i.e. she, him, them) were significantly related to self-reported depression scores of targets ($r = .30$), thus demonstrating cue validity. However, this linguistic cue was not utilized by judges in the formation of impressions of global depression. Judges' ratings of depression were not

significantly related to third-person pronoun usage ($r = .18$). In addition, judges used affective cues such as greater negative emotion words ($r = .35$) and fewer positive emotion words ($r = -.48$) in making their evaluations of target depression, although only positive emotion words were significantly related to (i.e. valid cues for) target depression ($r = -.38$). Word choice associated with more cognitive mechanisms (i.e. cause, ought, know) was both a valid ($r = .51$) and utilized ($r = .34$) cue for depression in the private diary essays. Additionally, the metaphysical linguistic category (i.e. God, heaven, coffin), and the subcategory of religion, were significantly related to depression self-ratings ($r = .41$ and $r = .39$, respectively). However, these cues were not systematically utilized by the judges ($r = -.05$).

When targets were divided into high- and low-depressed groups for the private diary condition, the validity of 3rd person pronouns as a cue used by judges for rating depression was enhanced for high-depressed targets ($r = .99$). While the use of more negative emotion words was positively correlated to judges' ratings of depression for low-depressed targets ($r = .34$), this cue was not significantly related to the self-ratings of low-depressed targets ($r = .02$). By contrast, higher use of negative emotion words was positively correlated to the self-ratings of high-depressed target participants ($r = .97$). Use of religious words was positively correlated with self-reported depression for high-depressed targets ($r = .94$), but not for low-depressed targets ($r = -.02$). As noted above, judges did not utilize this cue judges in forming impressions of levels of target depression.

In the public blog essays (see Table 4), in contrast to the private diary essays, use of 3rd-person pronouns was not a valid cue for target depression ($r = .16$) across the entire sample, nor was it utilized by judges ($r = .04$). The utilization and validity of affective cues paralleled the results found for private diary essays; both positive ($r = -.37$) and negative emotion words ($r =$

.31) were utilized by judges, but only positive emotion words ($r = -.26$) were valid cues for target depression. In forming global impressions of depression, other valid and utilized cues included the use of more swear words and referencing more sleep-related words (i.e. asleep, bed, dreams).

The validity and utilization of the linguistic cues also varied between high- and low-depressed targets for the public blog essays. Generally, more linguistic cues were valid among high-depressed than low-depressed targets, but utilization was higher for low-depressed targets. Although third-person pronouns did not emerge as a valid or utilized cue across all targets, it was a highly valid indicator of depression for high-depressed targets ($r = .99$). Positive and negative emotion words were also significantly utilized for impression formation of low-depressed targets ($r = -.31$ and $r = .30$, respectively); the relationships between each of these cues and ratings of high-depressed targets were non-significant. References to sleep were also valid ($r = .96$) and utilized ($r = .98$) in judgments of high-depressed targets.

Discussion

This study examined the accuracy of perceptions of subclinical depression from public and private writing samples. Judges achieved substantial levels of accuracy in perceptions of depression across writing contexts. The level of accuracy in the current study is comparable to accuracy achieved in perceptions of Big Five personality traits in the writing domain (Holleran & Mehl, in press). Accuracy was similar for both private and public writing contexts, which suggests that the self-descriptive writing domain provides good information for the perception of target participant depression, regardless of the public versus private nature of the writing task. In addition, the level of target depression influenced accuracy, such that judges were more accurate in judging depression among high-depressed targets than low-depressed targets. Additionally, accuracy for high-depressed targets was significantly higher in the public writing context than in

the private writing context. Finally, the linguistic cues utilized by judges in rating target depression were generally valid correlates of target depression, although both validity and utilization of cues differed between public and private contexts.

On the basis of these findings, it appears that the distinction between private and public contexts, at least within writing, does not affect of the level of accuracy. Judges in the current study achieved similar levels of accuracy in judging an inherently private trait (i.e. depression) in both private diary and public blog writing samples. However, while writing may provide generally high quality information for person perception, the public versus private dimension affected the patterns of valid linguistic cues for the judgment of depression (e.g. the links between depression and domains like cognitive processes, sleep, and metaphysical issues were valid in either public or private contexts, but not both). So, in order to achieve accuracy, judges relied on different linguistic cues. Thus, while the global accuracy of perceptions of depression did not differ statistically between the contexts, the use of linguistically-derived cues did vary.

Judgments of depression do not achieve the same level of accuracy in other domains (e.g. ecological audio samples; Mehl, 2006), so it may be that perceptions of depression are particularly enhanced by the information from writing samples. Funder's (1995) RAM model describes such an interaction between traits and information in that some types of information are particularly diagnostic for some particular traits. To the extent that linguistic cues are good information for a trait like depression, and to the extent that these cues are salient within writing samples, these contexts will enhance accuracy of person perception for depression.

Alternatively, the writing domain may yield higher levels of judge accuracy than audio samples because the information that targets provided was inherently self-descriptive because of the nature of the writing prompt. The writing domain may also be conceived as an inherently

private realm of self-expression, in which impression management strategies are less necessary. Thus, while context affected the written expressions of participants (such that linguistic cues were differentially related to levels of target depression in the two contexts), the range of these differences may be restricted by an effect of the domain. Further research might clarify the results of the current study by addressing the extent to which blog writing is conceived of as either private (e.g. addressed to a circle of close friends) or public (e.g. addressed to a large group of strangers). If targets addressed their blog to a more restricted audience (i.e. close friends), then the differences in language use found in the current study underestimate the effects of the private vs. public dimension.

A potential limitation of the current study is the degree of similarity between the measures used for target and judge ratings of depression. While targets completed the entire 21-item BDI, judges made their ratings on a global, single-item measure (i.e. “I see the person as someone who is depressed”). Many BDI items focus on behaviorally-manifested symptoms of depression such as hypersomnia, weight loss, and social withdrawal and it is unlikely that strangers would naturally have access to this information – especially after reading short writing samples. Thus, we felt it inappropriate to have judges complete the entire scale for each target.

In addition, we must be cautious in generalizing our findings on accuracy for different levels of depression because few target participants ($n = 5$) scored a 13 or more on the BDI. Despite this limitation, the finding that accuracy was enhanced in a public writing context relative to a private writing context deserves empirical and theoretical attention. Perhaps public writing provides depressed individuals the opportunity to communicate about their frustration (e.g. through the use of swear words) and reflect upon altered behaviors (e.g. sleep habits) to obtain sympathy or aid from readers. An extension of the current study would be to examine the

expression of depression, particularly among highly depressed participants, in naturalistic contexts. The current study examined a laboratory manipulation that mimicked one such naturalistic setting (i.e. blogs, online journals) in computer-mediated public communications, and further examination of these contexts could prove fruitful for the recognition and assessment of depression.

In conclusion, lay perceptions of subclinical depression gleaned from self-descriptive writing samples achieve considerable accuracy. The public versus private nature of the writing situations had minimal impact upon achieved accuracy, but was linked to different patterns in the validity and utilization of linguistic cues. We suggest that self-descriptive writing provides high information quality for person perception, particularly for privately manifested traits such as depression.

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Table 1

LIWC category base rates (within writing context)

LIWC category	Base rates				Paired-samples t test	
	Private diary essays		Public blog essays		<i>t</i>	significance level
	M	SD	M	SD		
Word count	391.8	136.4	353.7	148.5	2.66	.01
Total pronouns	17.6	2.5	16.9	2.5	1.43	.16
3 rd person pronouns	1.0	0.8	1.4	1.0	1.07	.29
Positive emotion words	4.5	1.6	5.4	2.2	2.92	.01
Positive feeling words	1.7	0.9	2.3	1.4	3.78	.00
Negative emotion words	2.4	1.3	1.8	1.2	2.56	.01
Sadness words	0.5	0.6	0.3	0.4	1.54	.13
Cognitive mechanisms	8.6	2.1	6.9	1.8	5.58	.00
Past tense verbs	1.2	1.1	1.0	1.1	1.19	.24
Metaphysical issues	0.2	0.4	0.2	0.3	0.70	.49
Religion	0.1	0.3	0.1	0.3	0.45	.66
Sleeping	.07	0.2	0.1	0.2	0.67	.50
Swear Words	.04	0.1	.04	0.1	0.04	.97

Note. $N = 57$. The LIWC-derived cues are computed as the proportion of the total number of words. LIWC = Linguistic Inquiry and Word Count analysis.

Table 2

Inter-judge consensus and accuracy for judges' ratings of targets' levels of sub-clinical depression

	Inter-judge consensus	Full Sample accuracy	BDI < 13 accuracy	BDI ≥ 13 accuracy
Private diary essay	.87	.49**	.31*	.62
Online blog essay	.78	.57**	.24	.92*

Note. BDI = Beck Depression Inventory; $N = 57$; Inter-judge consensus is the intraclass correlation ICC [2, k] for 4 raters; full sample accuracy is the correlation between the aggregated judges' ratings of a one item global depression measure and the participant's self-reported BDI score. BDI < 13 = participants below the cutoff point for moderate depressive symptoms ($n = 52$); BDI ≥ 13 = participants above the cutoff point for moderate depressive symptoms ($n = 5$). * $p \leq .05$; ** $p \leq .01$.

Table 3

Lens model analysis of judges' lay assessments of subclinical depression for private diary essays: Correlations between LIWC-derived cues and judges' ratings of participants' depression (cue utilization) as well as participants' self-ratings of depressive symptoms (cue validity)

LIWC category	Cue validity: Participants' self-ratings of depressive symptoms			Cue utilization: Judges' ratings of participants' depressive symptoms		
	Entire sample	BDI < 13	BDI ≥ 13	Entire sample	BDI < 13	BDI ≥ 13
Total pronouns	.37**	.06	.92*	.51**	.45**	.87*
3 rd person pronouns	.30*	.19	.99**	.18	.12	.71
Positive emotion words	-.38**	-.23	-.79	-.48**	-.43**	-.51
Positive feeling words	-.29*	-.20	-.77	-.19	-.12	-.54
Negative emotion words	.21	.02	.97**	.35**	.34**	.54
Sadness words	.60**	.12	.89*	.52**	.39**	.83
Cognitive mechanisms	.51**	.30*	.86	.34**	.25	.46
Past tense verbs	.32*	.26	.89*	.22	.15	.81
Metaphysical issues	.41**	-.05	.52	-.05	-.21	-.29
Religion	.39**	-.02	.94*	.01	-.17	.33
Sleeping	-.12	-.05	---	-.21	-.18	---
Swear words	-.04	-.20	-.05	-.10	-.05	-.41

Note. N = 57. Participants' depressive symptoms were assessed with the Beck Depression Inventory (BDI). Judges rated participants' levels of depression on the basis of a single item. BDI < 13 = participants below the cutoff point for moderate depressive symptoms ($n = 52$); BDI ≥ 13 = participants above the cutoff point for moderate depressive symptoms ($n = 5$). The LIWC-derived cues are computed as the proportion of the total number of words. LIWC = Linguistic Inquiry and Word Count analysis. * $p \leq .05$; ** $p \leq .01$.

Table 4

Lens model analysis of judges' lay assessments of subclinical depression for public blog essays: Correlations between LIWC-derived cues and judges' ratings of participants' depression (cue utilization) as well as participants' self-ratings of depressive symptoms (cue validity)

LIWC category	Cue validity: Participants' self-ratings of depressive symptoms			Cue utilization: Judges' ratings of participants' depressive symptoms		
	Entire sample	BDI < 13	BDI ≥ 13	Entire sample	BDI < 13	BDI ≥ 13
Total pronouns	-.06	-.07	-.14	-.09	-.14	.12
3 rd person pronouns	.16	.05	.99**	.04	-.07	.86
Positive emotion words	-.26*	-.08	-.83	-.37**	-.31*	-.69
Positive feeling words	-.17	-.04	-.31	-.33**	-.29*	-.42
Negative emotion words	-.05	-.19	.23	.31*	.30*	.57
Sadness words	.11	-.07	.16	.34**	.29*	.44
Cognitive mechanisms	.00	.12	-.82	.02	.08	-.64
Past tense verbs	.45**	.13	.96**	.43**	.25	.82
Metaphysical issues	.12	.13	-.05	.06	-.16	.44
Religion	.07	.02	-.05	.03	-.16	.44
Sleeping	.36**	.08	.96**	.27*	.04	.98**
Swear words	.58**	.11	.60	.49**	.13	.85

Note. N = 57. Participants' depressive symptoms were assessed with the Beck Depression Inventory (BDI). Judges rated participants' levels of depression on the basis of a single item. BDI < 13 = participants below the cutoff point for moderate depressive symptoms ($n = 52$); BDI ≥ 13 = participants above the cutoff point for moderate depressive symptoms ($n = 5$). The LIWC-derived cues are computed as the proportion of the total number of words. LIWC = Linguistic Inquiry and Word Count analysis. * $p \leq .05$; ** $p \leq .01$.