An Exploratory Investigation of Word Aversion

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Abstract

Why do people self-report an aversion to words like "moist"? The present study represents an initial scientific exploration into the phenomenon of word aversion by investigating its prevalence and cause. We find that as many as 20% of the population equates hearing the word "moist" to the sound of fingernails scratching a chalkboard. This population often speculates that phonological properties of the word are the cause of their displeasure. One tantalizing possibility is that words like "moist" are aversive because speaking them engages facial muscles that correspond to expressions of disgust. However, three experiments suggest that semantic features of the word – namely, associations with disgusting bodily functions – underlie peoples' unpleasant experience. This finding broadens our understanding of language and contributes to a growing literature on the cognitive processes relating to highly valenced and arousing words.

Keywords: Word aversion; lexical association; affective language; taboo

Introduction

Many people report that they find words like "moist," "slacks," and "luggage" acutely aversive. They describe the experience of hearing these words as similar to hearing nails scratch a chalkboard, often claiming that the sound of the word itself triggers their visceral reaction. Attention to this phenomenon has spread virally through social and traditional media in recent years. The word "moist," for example, has been the subject of a Facebook page (called "I HATE the word MOIST") with over 3,000 followers and was rated as the least liked word in the English language by a Mississippi State Poll (Ward, 2009); feature articles have been written in *Slate Magazine* (Malady, 2013) and *The New Yorker* (Greenman, 2012); and popular TV shows like "How I Met Your Mother" ("Stuff") and "The New Girl" ("Birthday") have devoted entire plot-lines to the comic consequences of word aversion.

The present study represents an initial scientific exploration into the phenomenon. Here, we address foundational questions: 1) Approximately what proportion of the population reports an aversion to words like "moist"? 2) Is aversiveness a dimension of words that can be measured in a behavioral task or is it defined exclusively by self-report? 3) What makes a word aversive? The referent? The sound? Some combination of the two? 4) And are there individual difference variables that predict who will experience word aversion? We have designed a series of studies that endeavor to provide a first step toward answering these important questions.

Of particular interest to us is uncovering the cause of word aversion, for which two hypotheses have been proposed. One possibility is that phonological properties of certain words are inherently unpleasant. This is an explanation that people with an aversion to the word "moist" often provide: for instance, one person, speculating on their aversion draws attention to "the 'oy' sound juxtaposed to 'ss' and 'tt'. It's not a word that sounds pleasant. Neither does hoist or foist" (quotation from a participant in Experiment 1). Psychologists and linguistics generally view sounds in a language as arbitrary with no inherent meaning (Hockett, 1960). However, some have argued that sound symbolism is a natural byproduct of enculturation in a language (Friedrich, 1979) and cross-cultural studies have found some evidence of sound symbolism beyond onomatopoeia (Nuckols, 1999). One tantalizing possibility is that words like "moist" are aversive because speaking them engages facial muscles that correspond to expressions of disgust (Buck, 1980; Strack, Martin, & Stepper, 1988). This facial feedback hypothesis is controversial and investigations of word aversion may help to shed light on embodied theories of emotion and language (Barsalou, 2012; McIntosh, 1996).

An alternative possibility is that the semantic referent or lexical neighborhood of aversive words makes these lexical items unpleasant. The word "moist," for instance, is sometimes used in a sexual context; people who are not averse to the word often speculate that it is aversive because "it reminds people of sex and vaginas" (quotation from a participant in Experiment 1). Prior work has found that a word's emotional context (valence and arousal) is at least partially responsible for the effects of emotional words (Talmi & Mascovitch, 2004). On this view, it may be possible to identify a coherent category of the lexicon as aversive. This finding would broaden our understanding of language and contribute to a growing literature on the processing of highly valenced and arousing words (Anderson, 2005; Kensinger & Corkin, 2004; LaBar & Phelps, 1998).

Experiment 1: Norming

In Experiment 1, we asked people to rate a set of 29 words from a variety of established lexical categories (taboo, disgust, positive, negative, etc) along six dimensions (arousal, aversiveness[1], familiarity, imagery, use, and valence). The ratings questionnaire and many of the stimuli come from prior work on taboo, emotionally valenced, and emotionally neutral words (Janschewitz, 2008) (see the first three columns of Table 1 for examples of words from some of these lexical categories).

Since previous work had not attempted to profile aversive words, specific target words were added to the set. Of primary interest to us in the present study is the word "moist," since it appears to garner the strongest feelings of aversion among the general population. To contrast the phonetic and sematic accounts of word aversion, we included some words that were semantically related to "moist" and some words that were phonologically related to "moist" (i.e., words with an /oi/ diphthong followed by a hard /st/) (see the two rightmost columns of Table 1 for examples of words from these categories).

Taboo	Disgust	Semantic	Phonologic
Nigger	Vomit	Wet	Foist
Retarded	Puke	Damp	Hoist
Shithead	Phlegm	Sticky	Rejoiced

Table 1. Examples of words used for the ratings task in Experiment 1 by category. Words from the taboo, disgust, and positive categories have been studied previously (Janschewitz, 2008); words that are semantically related and phonologically related to "moist" reflect a novel contribution of this experimental study.

We had several goals in Experiment 1: to quantify the prevalence of self-reported aversion to "moist," to test whether moist-averse people show a similar aversion to words with related semantic or phonetic properties, and to determine whether an aversive word evokes similar levels of arousal, imagery, and valence as other known categories of words (e.g., taboo or disgusting words).

Participants

We recruited 400 participants (227 female; mean age = 35) from mturk.com and paid them $0.50 in exchange for their participation in the brief survey. We restricted our sample to the United States and to Turkers who had a 90% approval rating on prior tasks to ensure high-quality data. Of the 400 participants, 387 reported that English was their first language. Everyone identified themselves as a highly fluent speaker of English.

Method

Participants rated 29 words along each of the six target dimensions (arousal, aversiveness, familiarity, imagery, use, and valence). The order of presentation was pseudo-random. Three words ("murderer," "gold," and "shithead") initiated

the survey so as to anchor participants' ratings. The subsequent two words came from one of four categories, represented by the 2 (negative or positive) by 2 (related or unrelated) table below.

	Related	Unrelated
Negative	Fuck Pussy	Nigger Retarded
Positive	Cake Delicious	Paradise Heaven

Table 2. The two words that participants rated immediately before "moist" came from one of the four categories above.

The context manipulation was designed to prime a sexual or culinary sense of "moist"; the unrelated negative and positive conditions served as a control to the general manipulation of valence. The remaining 23 words were presented in random order.

After participants completed the rating task, they answered two specific questions about the word "moist":

1) "Many people report that they have a particular aversion to the word 'moist.' Would you characterize yourself as being particularly averse to the word?"

2) "If you have an aversion to 'moist,' why do you find it aversive? Do you know what makes you think that the word is aversive? If you do not have an aversion to 'moist,' why do you think other people are averse to it?"

The first question was forced choice (yes or no) and the second was free response. The free response question was coded by two independent raters, who categorized whether the explanations identified semantic and/or phonological properties of the word as aversive. These categories were not mutually exclusive (i.e., a person's explanation could be coded as semantic, phonetic, both, or neither). Finally, participants were asked several personal and background questions, including their age, gender, first language, English fluency, ethnicity, religiosity, educational history, political ideology, geographic location, and personality with the Ten Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003).

Results and Discussion

Overall, we found that 21% of participants (n = 82) reported an aversion to the word. There was no relationship between contextual condition and moist-aversion, χ^2[df=3, N=400] = 4.24, p = .24.

Ratings of the six target dimensions in our study were highly correlated with ratings from Janschewitz (2008): of the 15 words that were included in both studies, we found a strong relationship for each dimension (average r = .93). Notably, even our dimension of "aversiveness" was highly correlated with Janschewitz (2008)'s dimension of "offensiveness," r[N=15] = .95, p < .001.

Janschewitz (2008) found that taboo and disgusting words were associated with an especially high valence, and a disparity between familiarity on one hand and personal use and offensiveness on the other: people were highly familiar with these words but did not use them and found them offensive. Neither taboo nor disgusting words were

noteworthy for their imageability or arousal, relative to other positive and negative words.

Like taboo and disgusting words, we found that moist-averse people rated "moist" as highly familiar and low in use. Relative to non-averse participants, those who reported an aversion rated "moist" as more aversive, $t[398] = 7.34$, $p < .001$, less familiar, $t[398] = 3.38$, $p < .001$, less used, $t[398] = 5.84$, $p < .001$, and connoting a more negative valence, $t[398] = 6.91$, $p < .001$. We found that the two groups rated "moist" as similarly arousing $t[398] = 1.20$, $p = .23$, and imagistic $t[398] = 1.29$, $p = .20$. Aversive words appear to have several properties in common with taboo and disgusting words.

Is "moist" aversive because it sounds unpleasant? People who reported an aversion to "moist" often attributed their unpleasant experience of the word to phonological properties of the word (39%) (e.g., "It just has an ugly sound that makes whatever you're talking about sound gross."). People who were not averse to the word were significantly less likely to link moist-aversion to the sound of the word (11%), $\chi^2[df=1, N=400] = 33.523$, $p < .001$, suggesting possible support for the sound symbolism hypothesis (Nuckols, 1999). In contrast, there was no difference in the proportion of moist-averse (65%) and non-averse participants (59%) who cited the word's sexual connotation, $\chi 2[df=1, N=400] = 0.784$, $p = .376$.

If the sound of the word really is the cause of peoples' aversion to "moist" then we might expect that moist-averse people would rate words with similar phonological properties as aversive as well. In fact, we found no such pattern. Moist-averse participants did not rate "foist," $t[398] = 1.43$, $p = .15$, "hoist," $t[398] = 0.16$, $p = .87$, or "rejoiced" $t[398] = 1.25$, $p = .21$, as more aversive than non averse participants.

Indeed, if we compare moist-averse participants who specifically identified the sound of the word as aversive (n = 32) to the broader sample, we find no evidence of a relative aversion to words with similar phonological properties: "foist," $t[398] = 0.37$, $p = .71$, "hoist," $t[398] = 1.37$, $p = .17$, or "rejoiced" $t[398] = 1.28$, $p = .20$.

One possible explanation for why people identify the sound of the word as the cause of their aversion is because highly arousing words are processed more automatically (Kensinger & Corkin, 2004), are more attention-grabbing (Anderson, 2005), and yield a greater autonomic response (Harris, Aycicegi, & Gleason, 2003; LaBar & Phelps, 1998) than low-arousal words. That is, the subjective experience of the aversion may be such that a person reacts so quickly and strongly to hearing the word that they think it is the sound of the word itself that is aversive.

Is "moist" aversive because it has unpleasant connotations? Instead, two sets of analyses suggest that people find "moist" unpleasant because of negative semantic connotations. First, across the entire sample, we found a difference in aversiveness ratings by contextual condition. People found "moist" especially aversive when it followed unrelated positive words (e.g., "paradise"; $M =$

36.81, $sd = 27.91$) or sexual words (e.g., "fuck"; $M = 36.19$, $sd = 29.53$); participants found "moist" relatively less aversive when it followed food primes (e.g., "cake"; $M = 31.52$, $sd = 27.66$) and when it followed unrelated negative words (e.g., "retarded"; $M = 26.97$, $sd = 26.83$), $F[3, 396] = 2.67$, $p < .05$.

There are two interesting patterns in these results. For unrelated words, there appears to be a rebound effect. Compared to "retarded," "moist" may seem innocuous; in contrast, compared to "paradise," "moist" may seem unpleasant. More elucidating, though, is the pattern we see in the related word conditions. When "moist" was preceded by sexual words, it was rated as more aversive, suggesting that "fuck" and "pussy" primed a more negative, sexual, interpretation of the target word. When "moist" was preceded by culinary words, on the other hand, it was rated less aversive, suggesting that "cake" and "delicious" primed a different, more pleasant, sense of "moist."

The second piece of evidence that suggests "moist" is aversive because of its semantic features came from ratings of semantically related words. Moist-averse participants reported higher aversiveness ratings for "damp," $t[398] = 2.70$, $p < .01$, "wet," $t[398] = 3.06$, $p < .01$, and "sticky," $t[398] = 2.67$, $p < .01$, than non-moist-averse participants.

Importantly, it was not the case that moist-averse participants gave higher aversiveness ratings overall (i.e., across all categories of words). To rule out this possibility, we fit a mixed-effects linear model to aversiveness ratings of two categories of words: those that were semantically related (damp, wet, sticky) and those from the taboo category (nigger, retarded, shithead). Lexical category (taboo vs. moist-related) and self-reported aversion to moist (yes vs. no) were treated as fixed effects, while participant and word were treated as random effects. Stepwise model comparisons revealed an interaction between the fixed effects, $\chi^2[df=2, N=400] = 15.641$, $p < .001$. In general, people rated taboo words as more aversive than synonyms for moist, $t[398] = 5.683$, $p < .001$, but there was no difference in the two samples' ratings of taboo words, $t[398] = 1.71$, $p = .09$. On the other hand, people who reported an aversion to moist rated the synonyms as more aversive than people who did not, $t[398] = 3.92$, $p < .001$.

These results suggest that despite peoples' self-report of an aversion to the sound "moist," the semantic association of the word underlies its aversive nature.

Are some people more likely to find "moist" aversive than others? We found a relationship between several of our individual difference measures and moist aversion. However, because we measured and tested numerous relationships (leading to potentially spurious findings), we only report significant relationships that were replicated in Experiment 2.

Logistic regression models identified age and neuroticism as the most relevant individual difference measures to word aversion. Younger participants were more likely to find "moist" aversive, $z[N=400] = 3.71$, $p < .001$, as were more neurotic participants, $z[N=400] = 1.89$, $p = .05$.

In sum, we are able to offer preliminary answers several of the questions that we set out to uncover. We found that roughly 20% of our sample reported an aversion to moist and that their aversion is more likely the result of the word's semantic features than phonological properties, despite intuitions to the contrary.

Experiment 2: Free Association

In Experiment 2, we sought to extend these findings by using a free association task. Rather than ask people to explicitly rate words along target dimensions, we asked people to write the first word that came to mind upon seeing the word "moist" (and the other stimuli from Experiment 1). The free association task is a more implicit measure of peoples' conceptual and lexical representations (Nelson, McEvoy, & Dennis, 2000) and can give further insight into the cognitive processes that underlie word aversion. For instance, given the results of Experiment 1, it may be the case that moist-averse participants are more likely to generate a sexual lexical associate to "moist" than non-averse participants. This would provide further evidence for the semantic relatedness hypothesis.

In addition to changing the task in Experiment 2, we added two individual difference measures: the Brief Loquaciousness and Interpersonal Responsiveness Test (Swann, Rentfrow, 2001), which measures the extent to which people respond to others quickly and effusively (BLIRTatiousness), and the Disgust Scale (Haidt, McCauley, & Rozin, 1993). The "blirtatiousness" scale has been shown to capture, for instance, how physiologically aroused a person becomes in response to unpleasant stimuli. One possibility is that people who are moist-averse are less loquacious and more sensitive to unpleasant properties of words. The Disgust Scale includes items relating to seven domains of disgust (food, animals, body products, sex, body envelope violations, death, and hygiene). It may be the case that people find "moist" aversive because they are particularly sensitive to a particular elicitor of disgust like body products or sex.

Participants

We recruited 400 participants from mturk.com and paid them $0.50 in exchange for their participation in the brief survey. Of these, 30 had participated in Experiment 1. Data from these participants were excluded, leaving responses from 370 people for analyses below (205 females; mean age = 33).

Method

The method of Experiment 2 was very similar to that of Experiment 1. Participants were presented with the same set of 29 words in the same pseudo-random order (with the contextual manipulation). However, instead of rating these words, we asked people to respond to each by writing in the first word that came to mind.

Following the free association task, we asked all of the same background questions as in Experiment 1 as well as

two additioanl scales: blirtatiousness (Swann & Rentfrow, 2001) and disgust (Haidt, McCauly, Rozin, 1993).

Results

In Experiment 2 we found that 13% (n = 49) of our participants reported an aversion to "moist." This represents a significantly smaller proportion of the sample than what we found in Experiment 1, χ^2[df=1, N=770] = 6.66, $p < .01$. One possible explanation for this difference is that the ratings task itself may have caused some people to experience "moist" aversively. That is, word aversion may result, at least in part, from an explicit consideration of the aversiveness dimension. There is some support for this possibility in peoples' free response speculation on the origin or their aversion to "moist." For instance, one person wrote, "I'm not sure I did [think "moist" was aversive] until other people pointed out that they were and then it started to bother me as well." This is an intriguing possibility that warrants further study.

As in Experiment 1, we found a significant difference in peoples' speculation on what makes the word aversive. Moist-averse participants were more likely to identify the sound of the word, χ^2[df=1, N=370] = 5.65, $p < .05$; there was no difference in peoples' likelihood of identifying the semantic connotation of the word, χ^2[df=1, N=370] = 1.53, $p = .22$.

What words do people associate with "moist"? Two independent coders categorized responses into five categories – food, sex, wet, yuck, and other – which emerged from reading the range of responses given by participants. A chi-square test of independence revealed a significant difference in the kinds of words that averse and non-averse participants gave in response to "moist," χ^2[df=4, N=370] = 50.20, $p < .001$. When the "other" category was removed to comply with the assumptions of a chi-square test of independence (namely, that no more than one of the expected counts should be less than 5; Yates, Moor, & McCabe, 1999), the results did not change, χ^2 [df=3, N=357] = 50.40, $p < .001$. Moist-averse participants were noteworthy for their tendency to react with a word like "yuck" or "eww" (see Table 3).

	Food	Sex	Wet	Yuck	Other
Non-averse	13.4%	13.7%	67.3%	2.2%	3.4%
Averse	6.1%	10.2%	53.1%	26.5%	4.1%

Table 3. Percentages of lexical associates generated by people who find "moist" aversive and people who do not.

As with Experiment 1, we included a context manipulation such that "moist" was preceded by a pair of unrelated negative words, unrelated positive words, food-related words, or sexual words. In Experiment 2, we found that the contextual manipulation affected the lexical associate that people generated. In every condition, the modal response was a synonym like "wet" (68%, 80%, 63%, and 51% in the negative, positive, food, and sex conditions respectively); however, there was a significant

difference in the proportion of synonyms given by condition, χ^2[df=3,N=370] = 18.65, *p* < .001. Not surprisingly, people were more likely to generate a word related to sex in the sexual condition (18% in the sexual context compared to 12% in the other conditions), χ^2[df=3, N=370] = 7.91, *p* < .05. People were more likely to generate a word related to food in the food condition (33% in the food context compared to 5% in the other conditions), χ^2[df=3,N=370] = 48.56, *p* < .001. These results conform with the findings from Experiment 1, which suggest that there are different senses of the word "moist" that can be primed.

Are some people more likely to find "moist" aversive than others? As in Experiment 1, logistic regression models revealed that younger people are more likely to find the word "moist" aversive, *z*[N=370] = 3.17, *p* < .001, and that increases in neuroticism are associated with increases word aversion, *z*[N=370] = 2.20, *p* < .05.

We found a marginal effect of blirtatiousness, *z*[N=370] = 1.66, *p* = .098: the more blirtatious the person, the less likely they were to report an aversion. This suggests that loquaciousness and social sensitivity may play a role in word aversion.

With regard to disgust, we did not find an effect when we used scores from the entire scale as a predictor, *z*[N=370] = 0.39, *p* = .70. However, using a subcomponent of the scale, we found that the more disgust people associate with bodily functions, the more likely they were to report an aversion to moist, *z*[N=370] = 3.16, *p* < .01. Interestingly, there was no relationship between word aversion and the sexual component of the disgust scale, *z*[N=370] = 0.84, *p* = .40. It may not be the sexual connotation of these words that make them aversive but a more general association to effluvia (Pinker, 2007).

Experiment 3: Lexical Decision Task

In Experiment 3, we brought participants into the lab for a lexical decision task in order to further investigate the nature of word aversion. Like the free response task, lexical decision tasks represent a more implicit measure of cognitive representations and processes (Seidenberg & McClelland, 1989). Since affect is known to modulate attention (Anderson, 2005; Easterbrook, 1959), we hypothesized that moist-averse participants might respond faster to "moist" than others. In addition, as in Experiments 1 and 2, we included a contextual manipulation to test whether people might show a sensitivity to the primed sense of the word – possibly showing faster RTs in the sexual word condition.[2]

Participants

We recruited 41 students from Oberlin College to participate in the lexical decision task. They were granted course credit in exchange for their contribution.

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[2] It should be noted that these data are preliminary and Experiment 3 is ongoing.

Method

Experiment 3, like Experiments 1 and 2, was designed to include words from a variety of categories (disgust, taboo) as well as specific target words relating to moist (i.e., words that were phonologically related to "moist" as well as words that were semantically related). Strings of letters were presented serially to participants in blocks of 80 items. In every block 50% of the stimuli were standard English words while the other 50% were non-words (generated by changing a letter or scrambling a set of letters from a matched word).

The first block was treated as a familiarization phase as were the first 20 trials of subsequent blocks. Data from these trials were omitted from analysis.

The word "moist" was always presented in the second block and was preceded by two words from one of four categories (see Table 2).

Following the lexical decision task, participants were asked if they are averse to the word "moist."

Results

Overall, 14% (n = 5)[3] of our sample reported an aversion to "moist." Because of the small sample size we were not able to compare reaction times to "moist" across the sample populations. However, we were able to test the effect of the context manipulation. We found an overall difference between negative and positive conditions, *t*[39] = 2.06, *p* < .05, when we collapsed across the dimension of relevance. That is, people responded to "moist" faster when it followed a negative word than when it followed a positive word, regardless of whether the negative or positive word primed a specific sense of "moist." This suggests a general effect of highly arousing negatively valenced words on attention that is consistent with prior work (e.g., Anderson, 2005).

Because we used stimuli from Janschewitz (2008), we were able to use ratings data from seven target dimensions (i.e., use, familiarity, offensiveness, tabooness, valence, arousal, and imageability) to predict response times. Stepwise model comparisons revealed that the best model included three predictors: arousal, offensiveness, and the number of letters in a word (see Table 4). The more letters in a word, the longer it took participants to identify it as a word; the more arousing a word, the faster people were to respond to it; and the more offensive a word, the slower people were to respond to it. This suggests that people might be taken aback by seeing a highly offensive word on the screen, which may delay their response.

Coefficient	*B*	*t*	*p*
Intercept	0.647	33.41	< .001
Arousal	-0.044	6.29	< .001
Offensiveness	0.030	7.03	< .001
Letters	0.017	6.06	< .001

Table 4. Results of a general linear model with Response Time as the dependent variable.

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[3] Data on the aversivness of "moist" for five of the 41 participants were not collected.

These results suggest that to the extent that "moist" is truly offensive to someone with an aversion to the word, they may actually respond more slowly than people without an aversion to moist. However, further work is warranted to answer this question definitively.

General Discussion

The results of three experiments represent a novel exploratory effort to better understand the cognitive underpinnings of word aversion. Our results suggest that as many as 20% of the population may be averse to "moist" and that such an aversion is related to age, neuroticism, and a particular kind of disgust: to bodily functions (and not phonological features of the word).

This work reveals that averse words may be similar to well-studied lexical categories like taboo and disgusting words. Our findings contribute to a growing literature on the processing of highly valenced and arousing words.

Future work will continue to explore the cause of word aversion using implicit measures like the lexical decision task and EEG. It will also seek to test the hypothesis that explicit consideration of the aversiveness of a word can cause word aversion (i.e., will seek to induce word aversion in a laboratory setting).

Acknowledgements

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