What the hell? What swearing can tell us about conventional implicatures

Stanley Donahoo and Vicky Tzuyin Lai, University of Arizona

Expressives are not-at-issue, speaker-oriented, conventionally implicated content (Potts 2005). How is the expressive dimension (Potts, 2007; McCready, 2010) of language processed and represented? The present study focusses on the most clearly expressive items, swear words.

The study of swear words is important to linguistics and cognition in general, but has been a neglected area experimentally. In clinical populations, those with aphasia or who have had stroke can often recite lengthy chunks of memorized material, such as prayers, song lyrics, or greetings; in many cases, these automatic chunks include swearing (Van Lancker & Cummings, 1999). Infamously, pathological use of swear words is a defining characteristic of Gilles de la Tourette syndrome (Shapiro & Shapiro, 1982). Finally, some work on swearing's effect on memory has been done. Using a Stroop task, MacKay et al. (2004) show that swear words cause a slowdown in naming relative to 'neutral' words.

We have begun to explore the mental underpinnings of swearing, from a behavioural and electrophysiological perspective, influenced by an account which is rooted squarely in pragmatic theory. Potts (2005, 2007) provides a detailed account of conventional implicatures, arguing that they have six properties: independence, nondisplaceability, perspective dependence, descriptive ineffability, *immediacy*, and repeatability. Ever since Grice (1975) characterized them, implicatures as a whole have remained problematic to our current models of communication. Swear words thus provide an ideal and yet unexplored testing ground for exploring implicatures and the expressive dimension.

The present study examined swear words using a lexical decision task and will use EEG next. Stimuli are 30 swear words (e.g. *shit*, *damn*), 30 negatively valenced but non-swear words (*kill*, *sick*), 30 open class neutral words (e.g. *wood*, *lend*), 30 closed class neutral words, as swear words are a closed class as well (e.g. *while*, *whom*), and 120 pseudowords, for a total of 240 items. Norms for valence and other dimensions were obtained from recent corpus work (Warriner, Kuperman, & Brysbaert, 2013; Balota et al., 2007). A summary of the stimuli can be seen in Table 1.

Table 1. Mean values for psycholinguistic variables for each stimulus type.

	Psycholinguistic Measure					
	Letter Length	Subtlex Freq.	Log Subtlex	Ortho N	Num Phonemes	Valence
Swear Words (*shit*)	4.96	119.93	3.39	8.24	3.84	3.38
Negative Valence Words (*kill*)	4.89	119.47	3.59	6.18	4.14	2.45
Open Class Neutral Words (*wood*)	5.00	116.69	3.25	6.39	4.04	6.15
Closed Class Words (*while*)	4.97	113.45	3.36	6.37	3.83	X[1]

[1] Values for only 6 of the 28 words were listed in the Warriner corpus, so we chose not to list an average for this category.

p value for t-tests comparing Swear Words with all others	.95	.56 (.99 for swear and neg only)	.55	.91	.51	NA

Participants had to decide whether a letter string presented on a computer screen was a word of English or not. We hypothesise that contrary to other negatively valenced words, swearing will cause an increase in reaction time, as this content may possibly be initially processed by a less efficient, non-linguistic channel. Results of 27 participants were analysed using linear-mixed effects modelling in R (Baayen, 2008). Any *t* value greater than 2.0 was deemed significant. Effects of type, excluding RTs more than 2.5 standard deviations from the mean, were robust (*t*=3.49 for Negative Valence; *t*=2.88 for Neutral; *t*=2.81 for Nonwords) with respect to swear words. Closed Class words were not different with respect to swear words (*t*=.23). Behavioural results are displayed in Table 2.

Table 2. $\log^{-1}$RT in ms for each stimulus type. Significance is with respect to swear words as the baseline (0~*, .001~**, .01~*, .05~.).**

Swear	Negative Valence	Open Class Neutral	Closed Class	Nonwords
547.1	511.7***	517.1**	557.8	598.5**

These behavioural results show that swear words are more effortful for subjects than other words that are similar in their negative affect, meaning that there is more to the expressive dimension than merely a heightened emotional state. Our results are situated within the Potts framework, and ramifications for theories of implicature, both conventional and conversational, will be discussed. In particular, Potts's principle of immediacy will be examined.

We are currently setting up the EEG version of the experiment. We predict an increased N400 response to swear words relative to the negative valenced words. King and Kutas (1995) showed that, if closed class words are contextually unexpected in a sentence context, they will induce an N400. Additionally, the N280 will also allow us to better explore the result that the swear words behave similarly to the other closed class words. EEG data collection to corroborate these behavioural findings is underway, and will help to isolate where in the brain these words are being processed.

With these results, we contribute a new data set for probing our understanding of the central properties of implicatures, further demarcating the semantic-pragmatic boundary.

Baayen, R. H. (2008). Analyzing linguistic data: A practical introduction to statistics using R. Cambridge Press.

Balota, D. A., Yap, M. J., Hutchison, K. A., Cortese, M. J., Kessler, B., Loftis, B., ... & Treiman, R. (2007). The English lexicon project. *Behavior research methods*, *39*(3), 445-459.

Grice, H. P. (1975). 'Logic and Conversation' in P. Cole and J. Morgan (eds.) Syntax and Semantics Volume 3: Speech Acts.

Mackay, D. G., Shafto, M., Taylor, J. K., Marian, D. E., Abrams, L., & Dyer, J. R. (2004). Relations between emotion, memory, and attention: Evidence from taboo Stroop, lexical decision, and immediate memory tasks. *Memory & Cognition*, *32*(3), 474-488.

McCready, E. S. (2010). Varieties of conventional implicature. *Semantics and Pragmatics*, *3*, 8-1.

Potts, C. (2005). *The logic of conventional implicatures* (No. 7). Oxford University Press on Demand.

Potts, C. (2007). The expressive dimension. *Theoretical linguistics*, *33*(2), 165-198.

Shapiro, A. K., & Shapiro, E. (1982). Tourette syndrome: history and present status. *Advances in neurology*, *35*, 17.

Van Lancker, D., & Cummings, J. L. (1999). Expletives: Neurolinguistic and neurobehavioral perspectives on swearing. *Brain research reviews*, *31*(1), 83-104.

Warriner, A. B., Kuperman, V., & Brysbaert, M. (2013). Norms of valence, arousal, and dominance for 13,915 English lemmas. *Behavior research methods*, *45*(4), 1191-1207.