

## EMOTION AND LANGUAGE

A vast domain of research on emotion and language cuts across many disciplines, methodologies, and theoretical frameworks. To render this topic coherent and manageable, we focus on the current resurgence of research on emotional words. Emotional words (e.g., *flower*, *shit*) contrast with connotatively neutral words (e.g., *toaster*, *being*) and include subcategories such as taboo words (insults, scatological references, and swearing or curse words), threatening words (e.g., negative valence words referring to menacing situations such as *murder* and *abuse*), and some **EMOTION WORDS** (e.g., *terror*, *disgust*). In a continuum of vocal emotional expression ranging from nonverbal (e.g., screams) to abstract verbal (e.g., figurative language; see **IDIOMS**, **IRONY**, **METAPHOR**, **VERBAL HUMOR**), T. B. Jay (2003) argues, taboo words constitute the strongest form of emotional language: Taboo words are more arousing than figurative language and yield reliable and robust emotional effects more often than do threatening words.

We review research on emotional words from historical, methodological, and theoretical perspectives.

### Historical Perspectives

Historical perspectives illustrate the multiple domains and methodologies of research on emotional words. In the mid-1800s, neuropsychological case studies of Hughlings Jackson (1958) and others helped shape current ideas concerning automatic or uncontrollable production of emotional words (see, e.g., Van Lancker 1987). Carl Jung's (1910) work with emotional words in free association tasks also shaped procedures for diagnosing clinical disorders such as schizophrenia (see also **PSYCHO-ANALYSIS AND LANGUAGE**). From 1950 to 1975, experimental psychologists used classical conditioning concepts to analyze the learning of emotional words (e.g., Staats 1968) and adopted *perceptual defense* paradigms to determine whether ego-protective processes shield threatening stimuli (taboo words) from awareness (e.g., Dixon 1971). However, both lines of research were largely abandoned: perceptual defense because of methodological flaws and the learning of emotional words because computer metaphors dominated the study of language and cognition and downplayed emotion during the period of 1975 to 1990 (Jay 2003).

### Methodological Perspectives

**RATING STUDIES.** Rating studies provide a method for determining the emotional qualities of words. A classic example is the semantic differential (Osgood, Suci, and Tanenbaum 1957), where ratings of words on bipolar connotative scales reflect three underlying dimensions: *evaluation* (the valence component, e.g., negative-positive); *activity* (e.g., fast-slow); and *potency* (e.g., strong-weak). L. H. Wurm and D. A. Vakoch (1996) argued that evolutionary considerations and relations between processing time data and the evaluation, activity, and potency ratings for words indicate an affective lexicon (for avoiding threats) that differs from the general lexicon (for obtaining valuable resources). Other rating studies involving the affective lexicon include Bellezza, Greenwald, and Banaji (1986), Bradley and Lang (1999), and Jay (1992). Unrepresented in current rating studies

are gender, age, psychological history, personality factors, social context, political and religious affiliation, and cultural factors (see **CULTURE AND LANGUAGE**), all of which powerfully influence people's perception of emotion-linked words (Jay 2000).

**SELF-REPORT AND FIELD STUDIES.** Field studies of taboo word use indicate that emotional language is learned early and persists well into old age (Jay 2000). Self-report studies suggest that punishment for cursing fails to alter the actual likelihood of swearing but nevertheless serves a function because the same people admit that they would punish their own children for cursing (Jay, King, and Duncan 2006).

**NEUROPSYCHOLOGICAL STUDIES.** Neuropsychological studies have focused on two primary dimensions of emotions: arousal (excitement) and valence (positive-negative). A primary neuropsychological measure of arousal and unconscious autonomic activity is the skin conductance response (SCR; see, e.g., LaBar and Phelps 1998). For emotional words presented to bilinguals, the SCR decreases as a function of the order in which a language is learned (Harris, Aycicegi, and Gleason 2003). The SCR also varies with the estimated emotional force of aversive words (Dewaele 2004) and occurs even when presentation times are too brief for word identification (Silvert et al. 2004).

**AMYGDALA** activity also indexes arousal: Threatening words trigger increased amygdalar activation (Isenberg et al. 1999), and amygdalar damage impairs recognition of arousal but not valence characteristics of emotional words (Adolphs, Russell, and Tranel 1999; see also Lewis et al. 2007 for the role of other subcortical structures in arousal). Some cortical and subcortical areas respond only to valence, some respond only to arousal, and some respond to an interaction of valence and arousal, particularly when valence is negative (Lewis et al. in press). Finally, some cortical areas respond to valence per se, while others respond selectively to either positive or negative valence (Maddock, Garrett, and Buonocore 2003).

Relative activity in the **LEFT HEMISPHERE (LH)** versus **RIGHT HEMISPHERE (RH)** also indexes emotional processing, albeit less consistently across studies, and the nature and scope of emotion-linked processing in the RH is an ongoing issue (see Borod, Bloom, and Haywood 1998). RH brain damage is associated with emotional blunting (Gainotti 1972) and difficulties in identifying emotional words or the emotion they represent, in matching words and emotions, in interpreting emotional content, in describing emotional autobiographical information, in self-expression with emotional words (Borod, Bloom, and Haywood 1998), and in comprehending and expressing humor (Blake 2003). The **CORPUS CALLOSUM** that links the RH and LH also plays a role in comprehending emotion-linked prosody, humor, and figurative usages (Brown et al. 2005; Paul et al. 2003). The **FRONTAL LOBE** seems to regulate or inhibit socially inappropriate uses of emotional words, with links between frontal lobe damage and verbal aggression, such as excessive cursing (e.g., Grafman et al. 1996).

**CLINICAL AND INDIVIDUAL DIFFERENCE STUDIES.** Client-patient interactions focus on emotions, and an inability to express one's

emotions in words may reflect a serious psychiatric problem known as alexithymia. Alexithymic individuals have few words for describing their feelings and communicating emotional distress, are unable to identify and describe subjective states, and have difficulty interacting with others, including therapists (Taylor, Bagby, and Parker 1997).

Clinical studies have developed strategies for facilitating therapeutic communication and emotional interactions in general, for example, use of metaphor (see Stine 2005). Clinical studies have also developed new ways of using emotion-linked words to diagnose psychopathology. An example is the emotional Stroop task where clients name the font color of words while attempting to ignore their meaning. Longer color naming times for specific word classes (e.g., *web*, *spider*) are associated with clinical problems such as phobias (e.g., arachnophobia), anxiety and depressive disorders, alexithymia, eating disorders, drug abuse, and a range of other psychopathologies (see Williams, Mathews, and MacLeod 1996 for a review).

**EXPERIMENTAL STUDIES.** Recent experimental studies have made extensive explorations of the effects of emotional words on cognitive processes such as memory and attention. For example, in a variant of the emotional Stroop task known as the taboo Stroop (MacKay et al. 2004), people name the font color of taboo and neutral words (equated for length, familiarity, and category coherence) while ignoring the meaning of the words and their screen location. They then receive a surprise memory test for the words, the font color of particular words, or the screen location of particular words, and the results indicate better memory for taboo than neutral words and better memory for the font colors and screen locations of taboo than of neutral words (see, e.g., MacKay et al. 2004; MacKay and Ahmetzanov 2005). These and other results suggest that taboo words facilitate recall of contextual details in the same way as do "flashbulb memories" for traumatic events such as the September 11, 2001 – tragedies, after which people vividly recall contextual details associated with the emotion-linked event, for example, how and when they first learned of the event, where they were, what they were doing, and who else was present (see MacKay and Ahmetzanov 2005).

Other results indicate that taboo words impair immediate recall of prior and subsequent neutral words in rapidly presented mixed lists containing taboo and neutral words (e.g., MacKay, Hadley, and Schwartz 2005), without impairing recall of neighboring words in pure, all-taboo lists (Hadley and MacKay 2006). However, lexical decision times (the time to identify a stimulus as a word) do not differ for taboo versus neutral words (MacKay et al. 2004). We discuss theoretical perspectives on this pattern of results next.

### Theoretical Perspectives

Current research on emotional words illustrates a gamut of theoretical perspectives that differ in their scope and goals and in the nature and specificity of the predictions they make. Jay's (2000) neuro-psychosocial theory of cursing summarizes likelihood estimates of various forms of cursing, based on neurological (e.g., conscious state, brain damage), psychological (e.g., personality, age, history), and social context (e.g., culture, class)

factors. American males are more likely to curse than females both as children and as adults, although women also learn a range of taboo words, whether they use them or not. Similarly, Americans with high sexual anxiety but no religious training are less likely to use sex-linked curse words than profanity or blasphemy, especially in conversations with same-sex others (see Jay 1992, 2000, 2003).

W. Bucci's (1997) multiple code theory (MCT) of emotional information processing links Freudian and **CONNECTIONIST** concepts via the concept of referential activity (RA). RA is an index of the ability to link primary (e.g., emotional, unconscious) and secondary (e.g., verbal, conscious) levels of processing within a connectionist network. Applied in the domain of clinical psychology, MCT has provided explanations for negative psychological states, such as repression, in terms of the nature or quality of connections between these fundamentally linguistic versus emotional levels of processing. Under MCT, people with high versus low RA differ in their ability to express and describe their emotions, in the structure and organization of their narratives, and in their therapeutic success rates.

Resource theories of emotion and attention (e.g., Wells and Matthews 1994) perhaps provide the broadest conceptualization of emotion and cognitive processes. Under resource theories, threatening stimuli attract limited-capacity cognitive resources, thereby reducing resources available for processing and responding to other stimuli, for example, font color in clinical, emotional, and taboo Stroop tasks. This hypothesis readily describes phenomena such as the taboo Stroop effect (longer times for naming the font color of taboo than of neutral words) but cannot describe other phenomena, for example, superior memory for the font color and screen location of taboo than of neutral words (see MacKay et al. 2004).

Two exceptions to the descriptive or post hoc approach that characterizes resource theories are noteworthy. One is arousal theory (e.g., LeDoux 1996) as applied to emotional words (e.g., Kensinger and Corkin 2003). Under arousal theory, low-level sensory aspects of emotional stimuli, such as taboo words, directly engage an emotional reaction system (in the amygdala) independently of other stimulus factors, such as context and presentation rate. The emotional reaction system then triggers enhanced skin conductance and facilitates memory consolidation for the emotional stimuli and their context of occurrence (in the **HIPPOCAMPUS**).

What makes arousal theory attractive is its generality and testability. For example, arousal theory explains flashbulb memories under the hypothesis that arousal tends to induce storage of perceptual images that include both the emotional stimulus and its context of occurrence. However, arousal theory as applied to emotional words has not fared well in recent tests: Contrary to arousal theory, if presented in mixed taboo-neutral lists at relatively slow rates (e.g., 2,000 ms/word) or if presented in pure (all-taboo or all-neutral) lists at rapid rates (e.g., 200 ms/word), taboo words are no better recalled than neutral words equated for familiarity, length, and category coherence (Hadley and MacKay 2006). Also contrary to arousal theory, recent data indicate that taboo words do not trigger imagelike memories (MacKay and Ahmetzanov 2005).

The second notable exception to the summary-description approach is node structure binding theory, or binding theory for short (e.g., Hadley, and MacKay 2006). Under binding theory, emotion-linked stimuli, such as taboo words, engage the emotional reaction system, which delays activation of binding mechanisms (located in the hippocampus) for linking concurrent neutral stimuli to their context of occurrence. As a result, (less important) neutral stimuli only form links to their context of occurrence after links to context for (more important) emotion-linked stimuli have been formed.

These binding theory assumptions have generated counter-intuitive predictions that subsequent experimental tests have verified. For example, unlike other theories, binding theory correctly predicted impaired recall of neutral neighbors before and after a taboo word if and only if mixed (taboo-neutral) word lists are presented *rapidly* (Hadley and MacKay 2006). Binding theory also correctly predicted no difference in recall of taboo versus neutral words in pure (all-taboo or all-neutral) lists presented *rapidly* or *slowly* (Hadley and MacKay 2006). Unlike other theories, binding theory also correctly predicted no difference in lexical decision times (the time to identify a stimulus as a word) for taboo versus neutral words (MacKay et al. 2004).

## Conclusion

Both historical and contemporary research on emotional words reflects a wide variety of theoretical and methodological approaches in fields ranging from neuroscience to psycholinguistics to cognitive and clinical psychology. Further research is required to piece together these multiple domains and to develop a general understanding of emotional words and their relation to other cognitive processes. However, emotional words currently seem poised to resume their central position in the language sciences and related disciplines.

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