To the Graduate Council:

I am submitting herewith a dissertation written by Paul Anthony Crandon entitled "Affective Tonal Value and Perceptions of Risk in Newspaper Readership." I have examined the final copy of the dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree Doctor of Philosophy, with a major in Communications.

Michael Singletary, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:

Associate Vice Chancellor and
Dean of The Graduate School

AFFECTIVE TONAL VALUE AND PERCEPTIONS OF RISK IN NEWSPAPER READERSHIP

A dissertation presented for the
Doctor of Philosophy
Degree
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Paul Anthony Crandon
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To my wife, Christine, for being the greatest partner and friend I could ever hope for.
This would never have been possible without you.

And to my parents, Thomas and Susan Crandon, for your constant love,
support, and encouragement.
Thank you for giving me such fine examples to emulate.
This would not have been possible without you, either.

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ABSTRACT

This study tests the notion that the affective tonal value (positive or negative connotations) of language in news coverage influences perceptions among readers using reactions to news of an environmental issue as a means of evoking differences. Methods involve constructing two different mock news articles, each altered only in tone (not fact), and a post-test survey of perceptions of risk and of overall situation seriousness. Participants (348 undergraduate students) read either one story or the other and then responded to a survey immediately following. Results show significant differences in perceptions of risk toward others, but not among perceptions of risk to self. There was also marginal support for differences in perceptions of overall situation gravity. No evidence was found for an interaction between the language manipulation and any of the demographics. Results show evidence of a main effect of tonal value, and an augmented third-person effect.

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"Choices of words and their organization into news stories are not trivial matters. They hold great power in setting the context for debate, defining issues under consideration, summoning a variety of mental representations, and providing the basic tools to discuss the issues at hand."
– Pan & Kosicki[1]

1 INTRODUCTION

For decades, scholars have investigated how people interact with and respond to language. On the cognitive level, people recognize words as symbols representing objects or concepts they can identify and describe. This is known as the formal level of understanding, or the *denotative* meaning of a word. Its complement, the affective meaning, represents the emotional responses evoked by the word, and is also known as its *connotative* meaning.[2]

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[1] **Z. Pan and G. M. Kosicki**, "Framing analysis: An approach to news discourse," *Political Communication*, 10 (1993): 70.

[2] **B. Goss**, *The Psychology of Human Communication* (Prospect Heights, IL: Waveland Press, Inc., 1989), 55f. See also **C. E. Osgood**, "Studies on the generality of affective meaning systems," *American Psychologist*, 17 (1962): 10-28.

While many words share roughly the same denotative meaning, *e.g.* wallet and billfold, purse and handbag, distribute, dispense, and allocate, no two words convey the exact same affective content; all words evoke emotional responses that are different from all other words. Though there is some variance between respondents – not all people react to a word in the exact same manner – scales have been developed that offer measures of emotional tone, and they have received at least some evidence of external validity. One such measure has been advanced by Whissell in the Dictionary of Affect in Language, which has been used in conjunction with computerized content analysis software to measure the affective tone of copy from a host of sources.[3]

This study investigates the notion that the tonal values used in news coverage influence readers' overall perceptions, using risk issues and perceptions of risk as a means of eliciting these differences in response. It borrows from other approaches to framing and frame theory by identifying the course of news composition and the subtle choices of article wording as part of the framing process. With Whissell's DAL the researcher tests whether reading news stories composed of words scoring differently in tone leads to differences in perception; more precisely in this case, whether less pleasant and more arousing language leads to higher reported perceptions of risk among readers. By having two groups read a different news account altered only in tone and then scoring their resultant perceptions of risk, the effects of tonal values in news coverage on risk perceptions can be examined.

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[3] Discussion of the validity of indices of affective meaning, particularly the work of Whissell, is included later in this paper.

All words carry meaning on functional and emotive levels (denotations and connotations). While some words describe human emotions directly, *e.g.* anger, fear, and love, according to Petrone and Whissell, it has become clear that even words that do not describe emotions per se, *e.g.* money, respect, and treachery, are capable of communicating an affective tone, suggesting that otherwise "ordinary" words carry an emotional component.[4] Although Whissell's is not the first attempt to catalogue the affective element of large numbers of words, the DAL is the most comprehensive and extensively used to date.[5]

Research Problem

The central research problem here is whether the affective tone in language is transferred to a readership – whether readers actually perceive an emotional or affective tonal quality when reading – and more specifically, whether affective tone influences readers' perceptions of risk, situation gravity, and sensationalism in coverage of risk issues. This study uses two mock news articles, each comprised of different emotional content as measured by Whissell's DAL. The question to be answered is whether subjects perceive different amounts of risk as a result of the language manipulation.

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[4] **B. Petrone and C. Whissell**, "The Dictionary of Affect in Language as a tool for the assessment of affective tone in a descriptive task," *Perceptual and Motor Skills*, 67 (1988), 789-790.

[5] **K. Sweeney and C. Whissell**, "A dictionary of affect in language: I. Establishment and preliminary validation," *Perceptual and Motor Skills*, 59 (1984): 695-698. **C. Whissell**, "Pleasure and activation revisited: Dimensions underlying semantic responses to fifty randomly selected 'emotional' words," *Perceptual and Motor Skills*, 53 (1981): 871-874. **C. Whissell and K. Charuk**, "A dictionary of affect in language: II. Word inclusion and additional validation," *Perceptual and Motor Skills*, 61 (1985): 65-66. David Heise also constructed earlier profiles of 1,000 common English words in **D.R. Heise**, "Semantic differential profiles for 1000 most frequent English words," *Psychological Monographs: General and Applied*, 79:8 (1965): 1-31.

If this is shown to be the case, the usefulness of such an instrument should be quite apparent: researchers could use Whissell's dictionary to measure the tone of large quantities of copy instantly, comparing publications alone and to each other, and across time. Studies could use these methods to examine the emotional tone with which a particular issue is portrayed by different media and whether the tone changes over time. Political speeches could be analyzed for changes in emotion from one to the next or from speaker to speaker. One could compare the tone of coverage from local media versus national media, for example, or analyze coverage from a single source over the life of an issue. Studies in public relations could look at the tonal values of an in-house newsletter compared with mainstream media (Are newsletters more pleasant that "real" news?). Advertising scholars and executives could examine trends in the field and study the efficacy of ads using different tonal values. Provocative questions could be probed – How has coverage of AIDS changed in tone from the early 80s to today? Are the news media becoming more arousing in their coverage? Less arousing? Does coverage of the Gulf War differ in tone from coverage of the Kosovo bombings or other military actions?

While the practical applications are abundant, the question still paramount is that of *effects*. Are readers sensitive to the tone of a message? If so, how does it affect the way they perceive what they have read? Before measuring and comparing the tonal values of the different media it is important first to investigate the possible effects affective tone has among a readership. This is the fundamental question being explored here, with the use of risk communication as a vehicle to evoke different responses.

That stated, this study has a secondary objective: to determine whether any further credibility can be advanced to the DAL as a method of measurement. If the emotional or affective tone of a newspaper article (or other message) influences the shaping of reader perceptions, then certainly further investigation into this area seems merited; if these influences can then be attributed to an experimental design using new instrumentation, then at least some credence could be given to that instrumentation.

This is primarily a study of framing because it is the language a reporter uses that makes up the frame or frames incorporated into a news story. Whether to describe a glass as half-empty versus half-full is simply the choice of the writer. This is not a question of fact, for both options are of equal value. But the tonal value of each is different. Similarly, calling something a "scandal" conveys different emotional content than would calling it an "affair." Smith, for example, examined secondary data from public opinion polls and found average public support for "the poor" to be 39 percentage points higher than for "welfare." Likewise, he found that support for the "unemployed" always exceeds support for "welfare." He found only support for foodstamps to be lower.[6] In another study, Schneider demonstrated that consumers respond more favorably to ground beef when its characteristics are framed positively (75% lean) as opposed to negatively (25% fat).[7] Affect in language is an issue of framing.

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[6] **T. W. Smith**, "That which we call welfare by any other name would smell sweeter," *Public Opinion Quarterly,* 51 (1987): 75-83.

[7] **S. L. Schneider**, "Framing and conflict: Aspiration level contingency, the status quo, and current theories of risky choice," *Journal of Experimental Psychology Learning, Memory, and Cognition.* 18 (1992): 1052.

Ghanem describes frames as having a cognitive dimension and an affective dimension, explaining that the cognitive elements encompass what is both included and excluded – the facts and figures – and that the affective element is the emotional content, often exerted "through the narrative structure of the news."[8] In the literal analogy of the picture frame, the frame "not only determines what is included but also sets the tone. An ornate picture frame sets a very different tone for a painting than a simple rustic frame."[9] To date, no other literature explicitly delineates frames into these two dimensions although, based on the examples above from Smith, this distinction seems quite reasonable. The present study suggests that the "tone" of which Ghanem speaks can be found within the emotional content of the words used in the message – be it a news article, an advertisement, or a poem. Clearly, evidence of a distinct component of the news frame – the affective component – and the ability to measure this affective tone instantly by computer would constitute a significant advance in frame theory, as well as in its application and methodology.

This study also includes a brief look into risk communication, particularly where it intersects with framing studies. The two have burgeoned somewhat hand-in-hand, particularly following the well-known Tversky and Kahneman study incorporating the "Asian disease problem."[10] In this study, subjects were given a scenario describing a

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[8] **S. Ghanem**, "Filling in the tapestry: The second level of agenda setting," in *Communication and Democracy: Exploring the Intellectual Frontiers in Agenda-Setting Theory,* eds. M. McCombs, D. L. Shaw, and D. Weaver (New Jersey: Lawrence Earlbaum Associates, 1997), 12f.

[9] Ibid., 10.

[10] **A. Tversky and D. Kahneman**, "The framing of decisions and the rationality of choice," *Science*, 221 (1981) 453-458.

dilemma with four possible outcomes – two framed positively as gains, two framed negatively as losses; subjects were given either one set or the other, from which they would choose the one they believed to be the most sound (Table 1.1).

As can be seen, options A and C are identical in outcome, although one is framed in a positive manner (number of people saved) and the other in a negative (number of deaths). The same is true for options B and D. Notice also that options A and C are stated as sure bets, while B and D are stated as gambles. Tversky and Kahneman wanted to see if these different framing options would influence people's decisions. Remember, subjects saw only the positive options, A and B, or the negative ones, C and D, and were asked to simply choose which one they prefer. They found that when the options given were framed positively, a majority of subjects (72%) chose the sure bets – option A. In

Table 1.1 The Tversky and Kahneman "Asian disease problem"
The same problem framed as gains versus losses[11]

Scenario	Positive Frames	Negative Frames
Imagine that the United States is preparing for the outbreak of an unusual disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:	**Option A** – if adopted, 200 people [of the 600] will be saved.	**Option C** – if adopted, 400 people [of the 600] will die.
	Option B – if adopted, there is a one-third probability that [all] 600 people will be saved, and a two-thirds probability that no people will be saved.	**Option D** – if adopted, there is a one-third probability that nobody will die, and a two-thirds probability that [all of the] 600 people will die.

[11] Table design borrowed from **V. F. Reyna and S. C. Ellis**, "Fuzzy-trace theory and framing effects in children's risky decision making," *Psychological Science*. 5 (1994): 277.

contrast, when the options given were framed negatively, 78% chose the risky gamble – option D.[12]

Clearly, Tversky and Kahneman found extreme framing effects in risk communication when language only, and not the facts, was manipulated. In this case, changing only one or two strategic words was sufficient to substantially influence behavior choice and perceptions of possible outcome. Interestingly, the only manipulation among the options is the substitution of the words "will be saved" for the words "will die." According to the DAL, the word *save* is significantly more pleasant than *die*; when using the words "positive" and "negative" in their discussion, Tversky and Kahneman could have unwittingly been alluding to pleasantness of the wording, rather than simply gains and losses. In addition, grammatically speaking, *all* options are phrased in the positive; there is no negation in any scenario. So "positive" and "negative" could be referring to the emotional values attached to the manipulated variables, rather than the gains or losses.

It seems reasonable that the nature of risk communication and the factors that guide people's perceptions of risk make this an exceptional place to begin looking for effects of language tonal values on reader responses.

The reason this study is different from the Tversky and Kahneman study and others is because instead of a foreign disease, it incorporates a more common risk issue – water quality – and rather than providing hypothetical options, it uses two equally feasible news articles. Each is potentially likely to appear in an ordinary newspaper, with only the

[12] Interestingly, Tversky and Kahneman used physicians as subjects in this study.

subtle differences in tone that might be expected to occur from one journalist to the next. Every effort was made to construct realistic accounts of the issue at hand, rather than creating drastically different articles that might more easily elicit differences in responses; this study more closely approximates a more natural experience for the subjects.

"From the perspective of traditional economic models of decision making, whether the 'glass is half-empty or half-full' should be irrelevant. Yet, in concert with previous framing studies, data from the current experiments show that presenting equivalent information in a positive or negative manner systematically influences the outcome of decision episodes."
– K. J. Dunegan[13]

2 Review of Literature

Affect in Language

Perhaps the most influential scholar in the study of affect in language was Charles Osgood, who spent most of the decade of the 1950s developing his breakthrough method of measuring meaning in language called the semantic differential and using this new tool to measure affective responses to hundreds of words, across age groups, ethnic groups, and political parties. Osgood's concept was that linguistic symbols are themselves tangible and embody a plurality of dimensions – words are more like real objects that take up space – and armed with the coordinates that signify a symbol's boundaries, the researcher can graph the space that symbol occupies. To his credit, the semantic

[13]**K. J. Dunegan**, "Framing, cognitive modes, and image theory: Toward an understanding of a glass half full," *Journal of Applied Psychology*. 78 (1993): 499f.

differential method caught on and the technique remains an anchor in social scientific research methods.

Measuring affect in language

Osgood was enthralled with the power of language to convey emotions and to touch the senses in a near physical fashion; he could almost see and smell and touch the words as they entered his eyes and ears. In the first chapter of his book *Focus on Meaning*, he reminisced about his days as a child playing word games with his grandfather, and of his first thesaurus, given to him by his aunt, Grace Osgood:

> As early as I can remember, he played all kinds of word games with me, teasing out subtle distinctions in meaning, giving me short lists of rare words to memorize, and rewarding me with penny candies when I used them spontaneously and correctly. I was thus one of the first M&M children, although the reinforcers were actually jelly-beans. I also recall my visual representation of the Thesaurus – a vivid image of words as clusters of starlike points in an immense space. I have always been a visualizer, which may explain why I did well in geometry but miserably in algebra. . . .
>
> Why I sub-title this paper "a personal diary" must now be obvious. But why do I title it "exploration" in semantic space? It is not just because I was for many years Director of an Institute of Communications Research organized within a College of Journalism – and "explorations in semantic space" *does* have a certain swing in an age of human exploration of outer space; it is rather because, for me, it *has* been an exploration – in time, in methods, and in geographical space, as well as in the inner, subjective space of meaning.[14]

Thus when Osgood arrived at Wilbur Schramm's Institute of Communications Research at Illinois in 1949, he brought with him a theory of meaning, a measurement

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[14] **C. E. Osgood**, *Focus on Meaning* (The Hague: Mouton & Co., 1976): 1f.

model (the semantic differential), and an image in his head – a conceptualization – of a semantic space.[15] He compares words to colors, with the different dimensions analogous to the brightness, saturation, and hue properties used to define the palette. His semantic space appropriates a neutral point where each word begins, analogous to the neutral gray of the color space. He compares degrees of "meaningfulness" to saturation, and the "quality of meaning" to the brightness and hue dimensions in color.[16]

For Osgood, emotionality has everything to do with the true meaning of a word; when he discusses the "meaning" of a word, he is less concerned with what a person *thinks* it means, and more concerned with what that person *feels* about that word. In his seminal work with George Suci and Percy Tannenbaum, *Measurement of Meaning*, Osgood discusses his approach to the basic functions of language and the communication of meaning:

> Ordinarily, if we want to find out what something *means* to a person, we ask him to tell us. What does a POLITICIAN mean to you? "Well it is someone who campaigns and does or does not get elected. It's usually a hearty, husky, good-natured guy who's always on the 'go' – but also a 'glad-hander' and liable to be untrustworthy, a double-talker. Not as good as a statesman, of course. . . . " What does SOPHISTICATED mean? "Well . . . I know what it means, all right, but it is hard to put into words. It's being clever and wise about people and things – knowing the ropes, so to speak. It's sort of smooth and polished, graceful but not awkward . . . poised, 'savvy,' you know. . . . "
>
> In other words, rather than relying on the spontaneous emission of words relating to a particular sign, we need to play a game of "Twenty Questions" with our subject: SOPHISTICATED – is it *hard* or *soft*? Is it *pleasant* or *unpleasant*? Is it *fast* or *slow*? Just as in "Twenty Questions" the selection of successive alternatives gradually eliminates uncertainty as to the object being thought

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[15] Ibid., 5.

[16] Ibid.

> about, so the selection among successive pairs of common verbal opposites should gradually isolate the "meaning" of the stimulus sign.[17]

This, then, is the essence of the semantic differential: researchers can arrive at an index of "meaning" reported by a subject or subjects about a given linguistic symbol by presenting the subject(s) with a series of paired bipolar adjectival scales, and recording the resultant responses of direction and intensity of association of the symbol to the scaled opposites. Since Osgood had envisioned a multidimensional semantic space, his next task was to locate and label these different dimensions that explain as much variance as possible in responses to what subjects called the meaning of a word.

Why does this fall under the subheading "Affect in Language"? The reason is because in determining what a term means, Osgood concentrates on how a respondent *feels* about it. He does not ask them to provide some definition of the word using any number of other words; he simply asks them to respond, on a seven-point scale between two verbal opposites, where they think the word rates based on the emotions they feel when considering it. To Osgood, these emotion-based responses comprise the true meaning of a word. The or dimensions he will eventually disentangle from the dozens of scales he uses are all components of affect.

Osgood's semantic differential

Osgood's first use of a seven-step scale defined by adjectival opposites appeared in

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[17] **C. E. Osgood, G. J. Suci, and P. H. Tannenbaum,** *Measurement of Meaning* (Urbana: University of Illinois Press, 1957): 18-20.

1939.[18] The early use of the method and the resultant analyses and improvements were admittedly made on a hit-and-miss basis;[19] Osgood himself acknowledged a chasm between theory and practice: " . . . this has been a major gap in our work so far: There has been no explicit statement of the relation between the theoretical conception of meaning as a representational mediation process, and the operations of measurement which constitute the semantic differential technique. The account to be given here is admittedly a highly speculative one – a sort of preliminary architect's sketch of what a bridge between these two levels of discourse might eventually resemble."[20] This does not, however, diminish the significance of these early studies, and history continues to validate the semantic differential as a measure of meaning.

Osgood *et al.* set out to create an index of meaning – a set of questions that could be put to a group of subjects, the answers to which would provide a fairly exhaustive inventory of the manifold feelings and impressions a word evokes within that set of subjects. To Osgood, the meaning of a word occupies an area in a *semantic space*, which lead him and the others to search for multiple dimensions in the responses to their semantic scales. They needed to find sets of responses that were independent, or orthogonal, which meant the presenting of a battery of scales, and then the subsequent

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[18] **C.E. Osgood, C.N. Allen, and H.S. Obert**, "Separation of Appeal and Brand-name in Spot Radio Advertising," *Journal of Applied Psychology* 23 (1939): 60-75.

[19] In **C. E. Osgood, G. J. Suci, and P. H. Tannenbaum**, Osgood calls the method of finding scales "Topsy-like," p. 20.

[20] Ibid., 25.

factor analysis that would produce clusters of semantic scales that measure discrete dimensions of meaning. The following is a brief example of what the subjects saw:

FATHER

happy	____ :	____ :	X :	____ :	____ :	____ :	____	sad
hard	____ :	X :	____ :	____ :	____ :	____ :	____	soft
slow	____ :	____ :	____ :	____ :	X :	____ :	____	fast

Three variables are at work here – the respondent, the semantic scales, and the concept being evaluated. Osgood notes that respondents were typical university undergraduate students, and that to obtain a truly representative sample across the general population would be both difficult and expensive.[21] Instead, more effort was spent selecting descriptive scales like those above. To start with, a list of forty nouns was read in rather quick succession to a group of 200 undergraduate students. The students were instructed to write down after each noun read the first descriptive adjective that occurred to them. These data were analyzed for frequency of occurrence, regardless of the primer word with which they appeared. Using this list and Roget's *Thesaurus*, the researchers found opposites to match each adjective to complete its semantic continuum.

In all, fifty semantic scales of verbal opposites were constructed, along with a list of twenty concepts.[22] Next, a group of one hundred students in an introductory psychology class served as subjects who rated each concept over the fifty scales. Using Thurstone's Centroid Factor Method, the researchers extracted four factors from a 50 x 20 x 100

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[21] **C. E. Osgood, G. J. Suci, and P. H. Tannenbaum**, 32. This account details earlier studies predating this publication.

[22] The 20 words or concepts used were derived fairly randomly, although care was taken to use words as diversified in meaning as possible to augment the total variability in meaning. Here is the list: LADY, BOULDER, SIN, FATHER, LAKE, SYMPHONY, RUSSIAN, FEATHER, ME, FIRE, BABY, FRAUD, GOD, PATRIOT, TORNADO, SWORD, MOTHER, STATUE, COP, and AMERICA.

matrix that accounted for a preponderance of the variance in the responses. The fourth of these factors only accounted for less than two percent of the overall variance and was thus said to be a residual. The remaining three factors were examined and classified (see Appendix A, p. 103).

These early studies with the semantic differential worked as planned, and the scales did indeed fall into highly intercorrelated clusters; these clusters represent the pluralism of meaning in its several dimensions in semantic space. For example, the scales *good-bad, beautiful-ugly, sweet-sour, clean-dirty, tasty-distasteful, valuable-worthless, kind-cruel, pleasant-unpleasant, sweet-bitter, happy-sad, sacred-profane, nice-awful, fragrant-foul, honest-dishonest, and fair-unfair* all "loaded," or were all found to correlate, at .75 or better, meaning that these semantic scales appear to be measuring approximately the same phenomenon – a singular dimension of meaning ascribed to a given word. Later studies would fine tune this dimension with scales that load at .90 or better.[23]

Dimensions of affect

In *Measurement of Meaning*, Osgood's factor analysis isolated and identified three major factors, or dimensions, in the "natural" semantic space: evaluative, potency, and activity. Each of these represents a different portion of the overall affective meaning of a concept, and together they account for most of the variance among responses. The

[23] **R. Stagner and C.E. Osgood**, "Impact of war on a nationalistic frame of reference: I. Changes in general approval and qualitative patterning of certain stereotypes," *Journal of Social Psychology*, 24 (1946): 187-215.

nomenclature given to each dimension were somewhat arbitrary, but are reflective of the content of the scales that loaded together.[24]

Evaluative. This dimension is perhaps the strongest of the three – loadings are the highest within this first factor, and the dimension to which the factor refers is often what one conceives of when considering the connotative meaning of a word. Strictly speaking, the evaluative dimension is the evaluation of the goodness or badness of a concept; thus the *good-bad* semantic scale has the highest loading at .88. Other scales that load high are *nice-awful* (.87), *beautiful-ugly* (.86), *honest-dishonest* (.85), and *fragrant-foul* (.84). Future researchers would equate this dimension with a concept's pleasantness or unpleasantness. Clearly, evaluation is a chief component of any affective response, and in considering the meaning of a word, one can quickly and easily recognize its importance.

Potency. More than directionality (good-bad), potency suggests strength or intensity of meaning. Scales that load high in this second factor include *large-small* (.62), *strong-weak* (.62), *heavy-light* (.62), and *thick-thin* (.44). *Rugged-delicate* also loads high at .60, but notice this scale reflects an evaluative meaning as well (eval. = -.42), suggesting that this scale is not as "pure" a measure of potency as, say, *strong-weak*. Interestingly, the emphasis placed on this dimension would eventually be diminished and another

[24] See also **C. E. Osgood**, *Focus on Meaning*. Descriptions of each dimension are from **C. E. Osgood, G. J. Suci, and P. H. Tannenbaum**, 36.

(activation) would take its place, although the underlying concept of *strength of meaning* remains important to the study of affect in language.

Activity. The third factor Osgood *et al.* extracted appeared to identify a word's level of activity. Scales such as *fast-slow* (.70), *active-passive* (.59), and *hot-cold* (.46) load high in this dimension.[25] Future exploration into this element of meaning led researchers to informally call it the "arousal" dimension since it seemed to be measuring the degree to which subjects became aroused when considering the stimulus concepts. For example, in Osgood's *Atlas of Semantic Differential Profiles*, the word "monkey" was rated as neutral or moderately pleasant (evaluation) and high in arousal (activity), while "cleanliness," although highly pleasant (evaluation), was rated as not very arousing.[26]

These three factors (dimensions) became the first measures of affect in language. Scales were tested and retested, and newer, more sophisticated statistics were employed as they became available, in an attempt to sharpen the semantic differential as a research instrument.[27] By isolating and administering those scales that precisely intercorrelated on each factor, Osgood, along with Suci and Tannenbaum and their successors, could produce multidimensional ratings for any number of words. The methodological underpinnings for a scientific measure of meaning then were in place; soon others would

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[25] **C. E. Osgood, G. J. Suci, and P. H. Tannenbaum**, 36.

[26] **C. E. Osgood**, "Semantic differential technique in the comparative study of cultures," *American Anthropologist* 66 (1964): 171-200, s.v. "monkey."

[27] The most complete chronicle of the development of the SD technique, including cross-cultural studies of validation and critical methodological reviews of the fitness and usefulness of SD is **Snider and Osgood's** *Semantic Differential Technique: A Sourcebook*, a compendium of more than 50 independent SD-related articles.

expand the usefulness of these new methods to create lists of thousands of words accompanied by their dimensional scores.[28]

Potency out – evaluation and activation in. As other scholars sought to advance Osgood's theories and to validate the various dimensions of affect, it became apparent that two factors would consistently emerge as dominant while subsequent dimensions of affect remained dubious.

A benchmark study in the refinement of the early Osgood *et al.* findings came from James Russell in 1978.[29] In it, he argues for the displacement of the less consistent, less powerful dimension of potency. He agrees that the remaining two basic dimensions of affect (a term he defines as "emotion as represented in language") – pleasantness-unpleasantness and degree of activation or arousal – are indeed compelling, but that the other, still labeled potency, is too enigmatic and unstable to retain as a staple, universal factor of affect.[30] He states that " . . . some evidence suggests pleasantness-unpleasantness and degree of arousal as two basic dimensions. Evidence of a third dimension has been less consistent, although some similarity can be seen in the concepts

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[28] The earliest list profiled 360 words in **J. J. Jenkins, W. A. Russell, and G. J. Suci**, "An atlas of semantic differential profiles for 360 words," *American Journal of Psychology*, 71 (1958): 688-699.

[29] **J. A. Russell**, "Evidence of convergent validity on the dimensions of affect," *Journal of Personality and Social Psychology*, 36 (1978): 1152-1168.

[30] Russell suggests that a good deal of residual variance is found not in affective meaning but in cognitive meaning. He does not, however, suggest that other dimensions of affect exist.

of potency, dominance, control, and other labels applied to the third dimension obtained in various studies."[31]

In a follow-up study, Russell again finds strong evidence of two dimensions and weaker indicators of a solid third dimension, reiterating earlier discussion:

> In the [earlier] Russell study, multidimensional scaling of affect terms was used to examine more closely the dimensions of affect beyond pleasure and arousal. Results provided evidence for at least three such dimensions. . . .
>
> . . . Nevertheless, I would argue against the use of more than two orthogonal dimensions in a conceptualization of affect. In the Russell and Mehrabian study,[32] pleasure and arousal accounted for by far the major proportion of variance in affect scales, with [the third dimension] accounting for quite a small amount.[33]

Soon after, Whissell tested the validity of using only these two dimensions, evaluation and activation, in measuring affective tone. Subjects were presented an eleven-scale semantic differential and asked to rate a sample of fifty words selected randomly from a dictionary. Factor analysis revealed three principal factors: a *pleasure* factor – strong, with 69% of the overall variance – an *activity* factor and a distant third factor interpreted as a *personalness* factor. Taken together, the evaluation factor and the activation factor accounted for 86% of the variance of scale means, while the addition of the third factor, personalness, increased the explaining power to 92%. Like those before, Whissell concluded that the dimensions of evaluation and activation are the most

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[31] **J. A. Russell**, "Evidence of convergent validity," 1153.

[32] **J. A. Russell and A. Mehrabian**, "Evidence for a three-factor theory of emotions," *Journal of Research in Personality*, 11 (1977): 237-294.

[33] **J. A. Russell**, "Affective space is bipolar," *Journal of Personality and Social Psychology*, 37 (1979): 354.

powerful indicators of affect in language and that while other dimensions may hold some explanatory power, their inclusion in subsequent analyses may not be cost-effective.[34] Whissell *et al.* later succinctly described the rationale for retaining only the two dimensions of evaluation and activation:

> The Dictionary of Affect reports ratings for two bipolar affective dimensions, evaluation and activation. There is considerable agreement in the literature on the validity of these dimensions and considerable *dis*agreement on the role which any other dimensions may play (Attention, Competence, Locus of Causation, Potency, and Dominance have all been suggested as additional dimensions). The variability in rating or scaling tasks which is explained by these first two dimensions (evaluation and activation) is very large in comparison to that left to be explained by any other dimension. In addition, researchers attempting to identify the third dimension have been obliged to resort to controlling the values of words on the first dimension (evaluation) to highlight variance attributable to other dimensions. evaluation and activation cannot jointly explain all response variance, but these dimensions are capable of explaining up to 80% of response variance, and in view of the fact that the third dimension is not stable (has not been elected with any consensus), and is not powerful (may explain less than 5% of the variance), it cannot be considered in the same class as evaluation and activation. Following this rationale, the Dictionary reports only the dimensions of activation and evaluation.[35]

Although it was not perfect, scholars were beginning to arrive at a parsimonious two-dimensional model of affect. Whissell would eventually apply this model to the measurement of thousands of words. The idea was to create a dictionary that could be used to measure the affective tone of other bodies of text, using the word as the basic unit of analysis.

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[34] **C. M. Whissell** (1981): 874.

[35] **C. M. Whissell, M. Fournier, R. Pelland, D. Weir, and K. Makarec**, "A Dictionary of Affect in Language: IV. Reliability, validity, and applications," *Perceptual and Motor Skills*, 62 (1986): 876.

This discussion of the semantic differential and its subsequent development is essential for a thorough understanding of how meaning is measured, and the notion of the multidimensionality of language provides the necessary theoretic underpinnings to the current study. Not only does a familiarity with the semantic differential technique play an important role in the evaluation of the proposed methods, but it also gives the reader the proper conceptual orientation with which to critically assess the results that will follow.

Compiling the Dictionary of Affect in Language – DAL

Incorporating the semantic differential technique and basing their efforts on previous work in measuring meaning, Sweeney and Whissell employed volunteers to score nearly 4,500 words for their first dictionary. Their goal was to compile a reference list of the affective "meanings" of frequently used words that could later be used to analyze text by computer. Words were chosen for inclusion based on their frequency of use in common spoken and written English. Words with the same root (e.g. wish, wishing, wishful) were thought to carry different connotations and were thus treated as separate entries, as were plurals, conjugations, and changes in tense. In the end, 4,323 words were checked for spelling and included in the list.[36]

Words were scored using the two predominant dimensions: evaluation (pleasantness) and activation (arousal) as measured by eleven different scales (Table 2.1). A group of

[36] **K. Sweeney and C. M. Whissell** (1984): 696.

Table 2.1 The 11-scale Semantic Differential used to isolate dimensions of affect in the Sweeney and Whissell DAL

1.	Blue	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Yellow
2.	Slow	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Fast
3.	Pleasant	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Unpleasant
4.	Friendly	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Unfriendly
5.	Relaxed	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Tense
6.	Comfortable	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Uncomfortable
7.	Enhancing	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Demeaning
8.	Black	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	White
9.	Competent	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Incompetent
10.	Personal	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Impersonal
11.	Tender	: ____ : ____ : ____ : ____ : ____ : ____ : ____ :	Tough

thirty-three students from a second-year course in psychology participated in the rating experiment. Each subject rated 800 words on a seven-point scale for evaluation and 800 words on a similar scale for activation, for a total of 1,600 words in one of two dimensions per subject. Not every subject rated every word; the maximum number of subjects rating a word was eight, with a mean of 4.5 and a mode of five. The mean evaluation ratings had a grand mean of 3.7 and a standard deviation of 1.02, while mean activation ratings yielded a grand mean of 3.98 and a standard deviation of 1.04. Ratings of one were defined as "most unpleasant" or "most unaroused" respectively, and ratings of seven as "most pleasant" or "most aroused."

Even though there is strong evidence to suggest that tonal value is a valid means for analyzing various texts, the potential *effects* of the affective tone on reader perceptions deserves more attention. Whissell and others have used it to measure tone in poetry,

literature, advertising, newspaper headlines, and lyrics to the Beatles' music.[37] In each case, discussed further below, evidence was clearly found to support the use of the DAL as a valid measure of affective tone by consistently rendering results that mirror previous critical, qualitative works.

The DAL is used to measure tonal values

In a stylometric study examining the song lyrics of Paul McCartney and John Lennon, for example, Whissell was able to replicate earlier critical studies whose findings suggest which writer was more happy, cheerful, etc. and which was more sad or depressed. She was also able to show quantitatively how the "mood" of the authors' lyrics changed over time, again, in agreement with other literary and music scholars' previous qualitative or hand-coded works. In addition, the dictionary was able to take a sample of song lyrics and correctly identify which writer composed it based primarily on the tone of the passage.[38] This was an important finding because it lends credibility to Whissell's methods and instrumentation, and offered the DAL as a valid tool for stylometrists.

In another example, Whissell and McCall found differences in the tonal values of advertisements aimed at men and women. The authors compared the copy from print ads

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[37] **C. M. Whissell**, "A computer program for the objective analysis of style and emotional connotation of prose: Hemingway, Galsworthy, and Faulkner compared," *Perceptual and Motor Skills*, 79 (1994): 815-824. **C. M. Whissell**, "Objective analysis of text: A comparison of adventure and romance novels," *Perceptual and Motor Skills*, 79 (1994): 1567-1570. **Whissell, C. and L. McCall**, "Pleasantness, activation, and sex differences in advertising," *Psychological Reports*, 81 (1997): 355-367. **C. Whissell**, "Traditional and emotional stylometric analysis of the songs of Beatles Paul McCartney and John Lennon," *Computers and the Humanities*, 30 (1996): 257-265.

[38] **C. Whissell**, (1996).

in leading men's magazines such as *Gentlemen's Quarterly* and *Popular Mechanics* to those found in women's magazines, such as *Ladies' Home Journal* and *Homemakers*. The study found that ads directed at men were more arousing (higher in activation) and less pleasant (lower in evaluation) than the ads aimed at women.[39] Within this study, a follow-up experiment revealed that women tend to rate ads as more successful in their appeals when words higher in pleasantness are used, while ads using words higher in arousal were rated more effective by both men and women. It seems apparent that people can be receptive to the different connotations of language and can respond differently to the changing tonal values.

In an experiment designed to investigate the emotional tone of newspaper headlines, Fournier *et al.* sought to provide a testable operational definition of "sensationalism" using the Whissell DAL.[40] The researchers obtained newspaper headline copy from three newspapers: the *Toronto Globe and Mail* and the *Wall Street Journal*, and one considered to be sensational, the *Toronto Star*. As an external check, the authors also included a similar sampling of article titles from the academic journal *Psychological Reports*. Results indicate that by using the DAL to analyze copy the researchers were able to identify copy deemed sensational:

> Sensationalism could be defined, in terms of the Dictionary of Affect, in one of two ways: it could involve a high level of activity in language regardless of evaluation in which case *Toronto Star* headlines and *Psychological Reports* titles would both be classified as "sensational". Although readers of the *Toronto Star* might readily agree with this classification, authors of papers in

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[39]**C. Whissell and L. McCall** (1997): 365

[40]**M. Fournier, M. Dewson, and C. Whissell**, "The Dictionary of Affect in Language: VI. 'Sensationalism' defined in terms of affective tone," *Perceptual and Motor Skills*, 63 (1986): 1073-1074.

> *Psychological Reports* would probably be surprised to find their material so described. An alternative definition of sensationalism would require the relatively high usage of active, unpleasant words. By this definition, titles in the *Toronto Star* would still be classified as sensational, but those in *Psychological Reports* would not.[41]

The host of applications of the Dictionary of Affect in Language continues to grow. In at least one experiment, Whissell created a root text, and substituted different words based on DAL scores to create contrasting bodies of text for groups of subjects to evaluate.[42] This is the basic method of the study proposed here – to create two distinct fictitious news articles by choosing words differing in pleasantness and arousal levels based on the DAL, and then comparing the responses of the two groups exposed to either one or the other article. The most current version of Whissell's dictionary incorporates a new three-point scale and includes thousands of new entries. Her most recent projects are in review, so recent changes in methods have yet to be published. However, a study of British Romanticism using the dictionary has recently been accepted for conference presentation.[43]

Media Framing

The last couple of decades have brought vast changes in the field of communication study, and with them a circumspect look at the state of affairs within the discipline.

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[41]Ibid., 1074.

[42]**C. Whissell and Lorna McCall** (1997): 360

[43] **C. Whissell**, "Dimensions of linguistic and emotional style describing the "Big Five" prototypical British romantic poets: Computerized analysis of representative samples" (Halifax, Nova Scotia: North American Society for the Study of Romanticism, August 12-15, 1999).

Some scholars note that much of communication research goes unnoticed by academicians in other fields, causing a lack of status among peer university groups.[44] Entman and others recognize communication studies as multi-disciplinary, bringing together theories from areas such as sociology, psychology, economics, and business.[45] The two strands of research addressed here, framing and risk communication, follow this pattern. Each finds its roots in other fields – primarily in psychology and sociology – but inescapably arrive on the laps of communications scholars because of their logical and inextricable ties to processes of communication. In this case, as in most, a slight bent has been added to the nomenclature, but only to clarify what is actually being studied; here "framing" becomes "media framing," and "risk analysis" becomes "risk communications." Both are the logical and natural progression from purely abstract theory to applied theory and research.

Interestingly, media framing and risk communication seem to be adjacent limbs on the theoretic family tree. Both evolved around the same time period, share common roots in social scientific study, and research surrounding each was published in journals across

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[44] **E. E. Dennis**, "Planning for Curricular Change: A report of the project on the future of journalism and mass communication education," (Eugene: University of Oregon, School of Journalism, 1987) [known as *The Oregon Report*]. **B. Medsger**, *Winds of Change: Challenges Confronting Journalism Education.* (Arlington, VA: The Freedom Forum, 1996). **J. S. Stark**, "Liberal Education and Professional programs: Conflict, coexistence, or compatibility?" *New Directions for Higher Education*, 57 (1987): 91-101. **R. M. Entman** (1993).

[45] **R. M. Entman**, "Framing: Toward a clarification of a fractured paradigm," *Journal of Communication*, 43 (1993): 51-58. **R. M. Entman**, "Educating for the new information profession," *Press/Politics*. 2 (1997): 96-103. **R. O. Blanchard and W. G. Christ**, *Media Education and the Liberal Arts: A Blueprint for the New Professionalism* (Englewood Cliffs, NJ: Lawrence Erlbaum & Associates, 1993). **E. E. Dennis**, 1987.

vastly different academic disciplines.[46] Almost immediately, scholars studying risk began incorporating new ideas emerging in the study of frames and framing, while research in framing generously borrowed from studies of risk perception.[47]

Definitions of media frames

In studying media framing, scholars have debated exactly what constitutes a media "frame." Gamson describes a frame as "a central organizing idea for making sense of relevant events and suggesting what is at issue. . . . Television news brims with metaphors, catch-phrases, and other symbolic devices that provide a shorthand way of suggesting the underlying story line. These devices provide the rhetorical bridge by which discrete bits of information are given a context and relationship to each other."[48] This definition is effects-oriented in that it describes a frame by its functionality on the user end. It suggests that people are given cues about a situation that prompt a particular *frame* or *framework* through which to interpret that situation. Thus when we are confronted with a message or a circumstance, we tend to call upon or "dial up" a frame to

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[46] **Tversky and Kahneman**, the first to posit ideas of framing, published these two articles: "The framing of decisions and the rationality of choice" in *Science* journal, 1981; and "Rational choice and the framing of decisions" in *Journal of Business*, 1986. Other publications from them on the topic appear in *Econometrica* and *American Psychologist* journals. **Paul Slovic**, a leader in the study of risk perceptions, published works on the topic in these journals: *Psychonomic Science, Cognition and Social Behavior, Accident Analysis and Prevention, Environment, Journal of Risk and Insurance, Pharmaceutical Medicine,* and *American Economic Review.* Clearly, early works on these subjects were of interest to a host of disciplines.

[47] See **C. L. Coleman**, "The influence of mass media and interpersonal communication on societal and personal risk judgments," *Communication Research.* 20 (1993): 611-628; **S. L. Schneider** (1992); **H. Chipman et al.**, "Audience responses to a risk communication message in four media formats," *Journal of Nutrition Education* 28:3 (1996): 133-140.

[48] **W. Gamson**, "News as framing," *American Behavioral Scientist* 33 (December 1989): 157f.

use as an interpretive template. Sociologists call these templates or frameworks *scripts* or *schemata.*[49]

When Tversky and Kahneman first tested the notion that people respond to cues about what to think and how to react, especially when making decisions, they found that people's choices of options were influenced solely by how the options were worded, either positively or negatively.[50] Subjects chose one option more often than another, even though the outcomes were the exact same with either alternative, ostensibly for no other reason than that the options were worded slightly differently. This is the essence of framing – that people are influenced by the manner in which a particular issue is presented, or *framed*, by the facts included or excluded, the terms used, and other cues given.

This approach to framing can trace its theoretic roots to agenda setting, a long-standing rubric in communication research. The original founders of agenda-setting theory – McCombs and Shaw – with colleague David Weaver edited a recent compendium discussing framing as the second level or tier of agenda-setting.[51] Early exploration into agenda-setting effects focused only on issue salience; little or no attention was paid to how an issue was covered. Studies simply showed that what issues

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[49] See **R. Abelson**, "Script processing in attitude formation and decision making," in *Cognition and Social Behavior*, eds. J. S. Carroll and J. W. Payne (New Jersey: Lawrence Earlbaum Associates, 1976), 33-45; **D. T. Gilbert and J. G. Hixon** "The trouble thinking: Activation and the application of stereotypic belief," *Journal of Personality and Social Psychology* 60 (1991): 877-889; and **D. E. Rumelhart** "Schemata and the cognitive system," in *Handbook of Social Cognition*, eds. R. W. Wyer and T. K. Swill (New Jersey: Lawrence Earlbaum Associates, 1984), 161-187.

[50] **A. Tversky and D. Kahneman** (1981).

[51] **M. McCombs, D. L. Shaw, and D. Weaver**, eds., *Communication and Democracy: Exploring the Intellectual Frontiers in Agenda-Setting Theory* (New Jersey: Lawrence Earlbaum Associates 1997).

were prominent in the media tended to also be prominent in the public agenda.[52] Framing research, however, takes this notion a step further by looking at *how* issues are portrayed in the media and whether framing effects can be found. Frame theory, then, marks a continuation and advancement of previous agenda-setting research.[53]

This study can potentially add to current approaches to frame analysis by further identifying the affective dimension of the frame discussed by Ghanem, and by suggesting a means for its measurement. Interestingly, Ghanem describes the affective dimension as the "tone" of the frame, but neglects to offer suggestions as to how this tone is manifest; this study suggests that the affective "tone" of the frame can be found in large part by examining the affective values of the words used within the frame.[54]

Despite the progress being made with the different conceptualizations of framing and what constitutes a frame, what develops with each one is more confusion over what framing essentially *is*. The term itself seems easily enough grasped, although this may be a function of its having been a common word in the ordinary vocabulary before being introduced into the social scientific vernacular. When something is said to be *framed* a certain way, there is already an intuitive sense of what is meant by this, with little extra clarification. This can lead to problems, however. For example, the word "frame" can

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[52] **M. E. McCombs and D. L. Shaw**, "The agenda-setting function of the mass media," *Public Opinion Quarterly*, 59 (1972) 176-187; **G. Kozicki** "Problems and opportunities in agenda setting research," *Journal of Communication*, 43 (1993) 100-127.

[53] **T. Takeshita**, "Exploring the media's roles in defining reality: From issue-agenda setting to attribution-agenda setting. *Communication and Democracy: Exploring the Intellectual Frontiers in Agenda-Setting Theory*, eds. M. McCombs, D. L. Shaw, and D. Weaver (New Jersey: Lawrence Earlbaum Associates, 1997), 15-27.

[54] **S. Ghanem**, 10-12.

function as both noun and verb, as in "*the reporter framed the story a certain way*," and "*she studied the various frames the story had occupied.*" Scholars often choose one variety or the other as the basis for study; studies may discuss the emergence or prevalence of particular media frames,[55] or they may discuss ways in which media actively participate in framing of issues.[56] Entman agrees that the current approach to framing is perhaps too fragmented: "Despite its omnipresence across the social sciences and humanities, nowhere is there a general statement of framing theory that shows exactly how frames become embedded within and make themselves manifest in a text, or how framing influences thinking."[57] He goes on to note that the terms *frame*, *framing*, and *framework* are all common outside of scholarship, and that the terms mean roughly the equivalent there as well. The shortcomings of frame terminology are many.

Consider Entman's definition of the verb infinitive, *to frame*: "To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral

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[55]See **B. P. Riechert**, "*Advocacy group and news media framing of public policy issues: Frame mapping the wetlands debate*" (Ph.D. diss., University of Tennessee, 1996); **J. N. Cappella and K. H. Jamieson**, "News frames, political cynicism, and media cynicism," *Annals of the American Academy of Political and Social Science* 546 (1996): 71-84; **N. T. Krogman**, *Framing disputes in wetland policy*. Paper presented at the Rural Sociological Society meeting, Washington, DC (1995); **D. L. Rhode**, "Media images, feminist issues," *Signs* 20 (1995): 685-710; **I. Shanto and A. Simon**, "News Coverage of the Gulf crisis and public opinion: A study of agenda setting, priming, and framing," *Communication Research* 57 (1994): 38-58; and **R. L. Schmitt**, "Enhancing frame analysis: Five laminating functions of language in the 1987 NFL strike," *Sociology of Sport* 10 (1993): 135-147.

[56]See **D. C. Anderson and W. W. Sharrock**, "Biasing the news: Technical issues in media studies," *Sociology* 13 (1979): 367-385; **M. Fishman**, *Manufacturing the news*. (Austin: University of Texas Press, 1980); **S. Iyengar**, *Is anyone responsible? How television frames political issues*. (Chicago: University of Chicago Press, 1991).

[57]**R. M. Entman** (1993): 51.

evaluation, and/or treatment recommendation for the item described."[58] This definition seems to be dubious, however, when one considers the removal of any of these elements. If framing is the *selection* of "some aspects," then without the knowledge, foresight, and implied motives of selecting there would be no frame. If to frame issues is to "make them more salient," then without this effect, it could be argued on the basis of this definition, there would be no frame. If to frame is to "promote a particular problem definition . . . or recommended treatment," then without this promotion there would be no frame. This type of analysis may seem overly meticulous; however, it does stress the need for more precise language.

The impossibility of not framing

Can a news story *not* be framed? Is there a way to construct a news story that contains no cues by which the reader interprets it? Is any word of any news story value-free? Is it productive, then, to assume that every text embodies a frame or frames? To assume that only certain texts contain or evoke frames is to assume that others do not. While there is little or no discussion of this type of approach, but the basis of this study rests on this notion that framing is both continuous and inescapable, asserting that language inherently contains a strong element of emotion and that through this emotional content the writer cannot avoid giving cues as to how the reader should interpret the text. Furthermore, readers are left with a residual emotional disposition that provides an affect on which present and future judgments about the text are based.

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[58] Ibid., 52.

Pan and Kosicki allude to this power of language in political discourse:

> Framing analysis pays close attention to the systematic study of political language, the coin of the realm in political communication that is often ignored or only dealt with in a highly abstract manner. Framing ought to sensitize researchers to examine political language as used at various stages of the political communication process: statements from policymakers, media content, and representations in audiences' minds as well as the operation of the political system. Choices of words and their organization into news stories are not trivial matters. They hold great power in setting the context for debate, defining issues under consideration, summoning a variety of mental representations, and providing the basic tools to discuss the issues at hand.[59]

The evidence is there; Smith reported disparate support for social programs, when only a key word had been changed. He found, for example, that 46% of subjects have a great deal of confidence in colleges, while only 29% have such confidence in professors. Forty-eight percent have a great deal of confidence in the military, while only 21% rank military leaders as high.[60] It is this subtle control over the nuances of language that gives media power to govern, consciously or unconsciously, much of the public's reaction to important social issues.

Entman almost agrees, saying that "the text contains frames, which are manifested by the presence or absence of certain keywords, stock phrases, stereotyped images, sources of information, and sentences that provide thematically reinforcing clusters of facts or judgments."[61] This is a common prerequisite in many conceptualizations of what constitutes a media frame – that until certain specific language is used that evokes

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[59] **Z. Pan and G. M. Kosicki**, 70.

[60] **T. W. Smith**, 76. It should be noted that this study used only secondary data. Smith compared separate public opinion polls whose questions were worded differently.

[61] **R. M. Entman** (1993): 52.

culturally held or iconic imagery, a "media frame" does not exist. Granted, nowhere does Entman suggest that texts without these qualities are without their own biases or leanings, but neither does he indicate that the content of these could be said to contain a frame.

This is where progress can be made concerning the distinction between *framing* and *frames*. *Framing* (verb) should be thought of as both unavoidable and continuous in the act of composing a text, and whose content may or may not "catch on" and perhaps be considered a media "frame" sometime in the future. Analytically, a media *frame* (noun) should be thought of as an identifiable and repeated course of textual presentation, regardless of reporter motive or whether there was a conscious orchestration taking place. And since language is inherently emotion-laden, these frames would naturally carry an element of bias or value; however, this is not the defining characteristic. Many frames identifiable today are said to be attempts to downplay or remove emotion from an otherwise socially hot topic.

Biased or unbiased, conscious or unconscious, the media present stories as news that contain factual information, and that also, perhaps more importantly, do so in a manner that inherently influences audience reaction to that news story. Language has subtle but drastically different meanings from word to word. A politician is a both a statesman and a bureaucrat, an orator and a demagogue. This study will test the idea that subtle differences in the affective tone of language will influence the way readers respond to a given text.

Perceptions of Risk

While this study is primarily a study of media framing and the role of affective tone in reader perception formation, since risk issues are used as the vehicle with which to elicit the differences in responses, some attention should be given to the study of risk perception and risk communication.

Why and how individuals come to perceive something as risky or dangerous has been the topic of much inquiry and a number of theories have evolved that attempt to explain why certain people tend to fear certain things. Wildavsky and Dake discuss the *knowledge*, *personality*, *cultural*, and *political* theories or approaches to risk perception.[62] The knowledge approach suggests that risk perceptions follow knowledge levels. This notion supposes that people perceive technologies and other things as more risky or dangerous the more they know about them. This approach has been shown to be without merit, and in fact the opposite effect has been found.[63]

Personality theory simply ascribes a significant proportion of variance in risk perceptions and propensities between individuals to matters of personal difference: "Some individuals love risk taking so they take many risks, while others are risk aversive and seek to avoid as many risks as they can."[64] A softened version of this approach holds that "stable individual differences among persons are systematically correlated with their

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[62] **A. Wildavsky and K. Dake**, "Theories of risk perceptions: Who fears what and why?" *Daedalus* 119 (1990):54-55.

[63] **M. Morgan** et al., "Powerline frequency electric and magnetic fields: A pilot study of risk perception," *Risk Analysis* 5 (1985): 139-149.

[64] **A. Wildavsky and K. Dake**, 42.

perceptions of danger."[65] This perspective receives mixed support. It is hard to label somebody risk-aversive or risk-seeking across the board; however, personality traits often interact with other risk-behavior factors.[66] Cultural and political approaches, like their counterparts, discuss individual risks on societal levels, meaning that some variance in perceptions of risk can be attributed to cultural biases such as with the fear of dying.

While these theories ignore the role of media in shaping perceptions of risk, the relationship inherent between media framing and risk communication seems readily apparent. The framing of risk-related issues in the media may be a strong source of effects on consumers of the news media. Tversky and Kahneman found framing effects by using a crisis situation involving potentially risky choices for participants.

Dunegan found framing effects when asking students in an upper-level management course to rate the risks involved in certain potentially risky business investments. "From the perspective of traditional, economic models of decision making, whether the 'glass is half-empty or half-full' should be irrelevant. Yet, in concert with previous framing studies, data from the current experiments show that presenting equivalent information in a positive or negative manner systematically influences the outcome of decision episodes."[67] Others followed, finding framing effects in decision-making processes.[68]

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[65] Ibid., 43.

[66] Ibid., 49.

[67] **Dunegan, K. J.** 499f.

[68] **D. F. Schoorman** *et al.*, "Escalation of commitment and the framing effect: An empirical investigation," *Journal of Applied Social Psychology* 24 (1994): 509-528. **D. V. Shah, D. Domke, and D. B. Wackman**, "To thine own self be true: Values, framing, and voter decision-making strategies," *Communication Research* 23 (1996): 509-61.

But more study linking these two paradigms is needed. For example, while Morgan *et al.* found that higher knowledge levels tend to correlate with lower levels of risk perception, Mazur noted that simply by mentioning potential risks, the coverage may make those problems seem more probable.[69] Sandman *et al.* point out other factors that may be prevalent:

> For example, technical detail might make a story more credible, thus heightening the alarm from an alarming story. Education, sex, and risk aversion – all factors beyond the control of the agency or corporate communicator – are more potent still. And all the factors assessed in the research reported here together accounted for relatively small percentages of the variance in behavioral intentions. Clearly, many other factors, as yet unknown, are at work."[70]

Levels of risk perception

Scholars agree the issue of risk perception is complex and multidimensional.[71] Information or coverage about risk-related issues clearly affects different people

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[69] **A. Mazur**, "Media coverage and public opinion on scientific controversies," *Journal of Communication* 31 (1981): 106-115. Interestingly, Mazur's theory is that *any* news coverage will inherently lead to greater perceptions of risk. He maintains that simply discussing an issue tends cast suspicion, even when the discourse is positive on its face or designed to mitigate risk perceptions.

[70] **P. M. Sandman** *et al.*, "Agency communication, community outrage, and perception of risk: Three simulation experiments." *Risk Analysis* 13 (1993): 596.

[71] **C. L. Coleman** (1993). **S. Dunwoody and K. Neuwirth**, "Coming to terms with the impact of communication on scientific and technological risk judgments," in *Risky business: Communicating issues of science, risk, and public policy*, eds. L. Wilkins and P. Paterson (New York: Greenwood, 1991), 11-30. **J. Fessenden-Raden, J. M. Fitchen, and J. S. Heath**, "Providing risk information in communities: Factors influencing what is heard and accepted," *Science Technology & Human Values* 12:3-4, (1987): 94-101. **D. Golding, S. Krimsky, and A. Plough**, "Evaluating risk communication: Narrative vs. technical presentations of information about radon," *Risk Analysis*, 12 (1992): 27-35. **S. Horning**, "Reading risk: Public response to print media accounts of technological risk," *Public Understanding of Science* 2 (1993): 95-109. **P. Slovic** (1992).

differently and on different levels.[72]

Personal and societal risk. Tyler and Cook noted the distinction between the personal level of risk and the societal level, which holds that while people may estimate a degree of personal risk to self, they may also determine a separate and often different assessment of societal risk to others, much like an often cited third-person effect. Many risk issues such as gun control and cigarette smoking might be rated as high risks on the societal level, but tend to score lower on personal levels. There is a tendency for people to admit that something poses a general threat to society, say with handgun ownership or gun-related issues, but then to deny feeling the same risk to the self. While we might believe that too many people own handguns and that more gun control legislation is needed, we also might tend to think we will not be affected personally or be involved in a gun-related tragedy. Similarly, most people admit that cigarette smoking is a dangerous activity. Yet certainly most smokers think that they won't get cancer or otherwise be affected by their habit. Estimations of risk to self and risk to others are two distinct measures, and the latter, given similar situations, is almost without exception higher. When weighing perceptions of risk, it is helpful to keep these two perspectives separate.[73]

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[72] **C. L. Coleman** (1993). **W. J. McGuire**, "The myth of massive media impact: Savagings and Salvagings," in *Public Communication and Behavior,* ed. G. Comstock (Orlando: Academic Press, 1985), 173-257. **Slovic, P.** "Perception of Risk: Reflections on the Psychometric Paradigm," in *Social Theories of Risk,* eds. S. Krimsky and D. Golding (Westport, Conn: Praeger, 1992), 117-152

[73] **T. R. Tyler and F. L. Cook**, "The mass media and judgements of risk: Distinguishing impact on personal and societal level judgements," *Journal of Personality Social Psychology* 47 (1984): 693-708. See also **W. P. Davison**, "The third-person effect in communication," *Public Opinion Quarterly* 47 (1983): 1-15.

Cognitive and affective risk. Slovic, and Dunwoody and Neuwirth examined risk perceptions with the idea that risk is multidimensional, including both cognitive and affective components.[74] The first of these – cognitive – represents overall risk assessment. People make a cognitive estimate, to the best of their ability, of the degree to which danger is present in potentially hazardous situations. A measure of cognitive risk can answer the question "How likely is *Hazard X* to occur?" Slightly different, affective risk represents the degree to which people actually *worry* about the occurrence of an event. Cigarette smoking, again, provides a good example. Smoking can be seen as a high-cognitive risk behavior; people know the health risks involved with smoking. At the same time, it can also be seen as low-affective risk because people tend not to worry about the potential consequences of smoking. Traveling by air is the opposite. Many people fear flying even though they know it to be one of the safest forms of travel. This makes it a low-cognitive, high-affective risk.[75]

It is within these two levels of risk – personal and societal– that this study will look for differences in both cognitive and affective risk assessment, based on changes in textual tone.

Gender. Studies show that generally women tend to perceive issues as more risky across the board. McBeth and Oakes found gender, along with age and knowledge, to be key

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[74] **P. Slovic**, "Perceptions of risk," *Science* 236 (1987):280-285. **S. Dunwoody and K. Neuwirth**, "Coming to terms with the impact of communication on scientific and technological risk judgments," in *Risky business: Communicating issues of science, risk, and public policy* eds. L. Wilkins and P. Paterson (New York: Greenwood 1991).

[75] **P. Slovic** (1992).

variables predicting opposition to the transportation of radiological waste.[76] Barke *et al.* recently found that among men and women scientists, women tended to perceive higher degrees of risk associated with nuclear technologies.[77] Spigner et al. surveyed 1,244 undergraduates to assess the extent of perception of risk associated with drug use and found that women were more likely than men to perceive greater risk with use of alcohol and other drugs.[78]

While these findings lead to a similar expectation in this study, the more provocative question is whether there is an interaction effect between gender and language on perceptions of risk. Is it possible that females are more receptive or open to the emotional cues given in language, which could lead to an augmented effect of risk perception? We could see an overall language effect and an overall gender effect, as well as an interaction between the two. There is no current research suggesting this to be the case, and thus no such hypothesis here, although analysis will include any findings of this nature *post hoc*.

Hypotheses

The research suggests that framing effects can result from wording news accounts in different ways; research also suggests that the affective component of the language used

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[76] **M. McBeth and A. S. Oakes**, "Citizen perceptions of risks associated with moving radiological waste," *Risk Analysis* 163 (1996): 421-427.

[77] **P. R. Barke, H. Jenkins-Smith, and P. Slovic**, "Risk perceptions of men and women scientists," *Social Science Quarterly* 781 (1997): 167-176.

[78] **C. Spigner, W. Hawkins, and W. Loren**, "Gender differences in perception of risk associated with alcohol and drug use among college students," *Women and Health* 20(1993): 87-97.

in news coverage might be a viable component of the affective dimension of a frame. Other presuppositions should be detailed before articulating specific hypotheses.

First, news stories can be scored for affect, regardless of context. The validity of determining the emotional valence in stories from the qualities of individual words within them has received strong support from the evidence presented by Bestgen.[79] He showed that multi-word units or sentences incorporate affective tones that are reliably detected by readers and that these tones can be predicted from the additive affective content of the words in the text. Scoring articles by word appears to be a feasible method of assessing the strength of the manipulation.[80]

Second, people are sensitive to the emotional component of words. When people read an account of a situation, some will respond differently if it is called a *crisis* rather than if it is called a *predicament*. Similarly, saying two parties have "reached a standstill" is different than saying "neither party will budge," and each conveys a different emotional sense. This study tests the notion that readers respond to this lexical emotionality, forming attitudes and perceptions accordingly.

Finally, use of emotion-laden terms in news coverage may affect risk judgments. Risk assessment includes elements of fear, anxiety, worry, and dread – reactions seemingly operating on emotional levels. These reactions can be said to be more closely related to lower levels of pleasantness and higher levels of arousal. Thus it is conjectured

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[79] **Y. Bestgen**, "Can emotional valence in stories be determined from words?" *Cognition and Emotion* 8 (1994): 21-36.

[80] Ibid.

that reading stories with words that are less pleasant and more arousing will elicit *higher* levels of risk perception.

H_1 Subjects shown copy using words lower in pleasantness (evaluation) and higher in activation (arousal) report higher perceived societal cognitive risk.

The first hypothesis suggests that those reading the more "harsh" article (Group 2) will report higher levels of estimated (cognitive) risk on the part of others than will those reading the "softer" article (Group 1). In other words, subjects in group 2 will think that others will estimate higher levels of risk (survey questions 2 and 5, p. 109).

H_2 Subjects shown copy using words lower in pleasantness (evaluation) and higher in activation (arousal) report higher perceived societal affective risk.

The second hypothesis is like the first in that it predicts subjects' estimations of the perceptions of others, although these questions (survey questions 3 and 6, p. 109) ask how much the subjects think others will *worry* (affective risk) about the issue.

H_3 Subjects shown copy using words lower in pleasantness (evaluation) and higher in activation (arousal) report higher perceived personal cognitive risk.

H_4 Subjects shown copy using words lower in pleasantness (evaluation) and higher in activation (arousal) report higher perceived personal affective risk.

The third and fourth hypotheses mirror the first two, except that these predict responses pertaining to the subjects themselves on both the cognitive and affective levels (survey questions 1, 4, 7, and 8, p. 109).

"Evidence based on faith alone is not science; it is not empirical because it is personal. Personal wisdom is not subject to refutation. Scientific data must be open to inspection, and social science wisdom is always subject to challenge"
–Michael Singletary[81]

METHOD 3

Subjects and Design

The subjects for this study included 348 undergraduate students enrolled in beginning sociology, English, and communication courses. The experimental design is exposure–posttest only. These subjects were chosen for their convenience in that introductory courses typically include students from a broad range of academic courses.

Randomness is not a requirement for this experiment since generalization is not the goal; however, equivalence of the experimental groups is important and will be checked in the results section of this study. The experimenter seeks not to generalize the opinions and attitudes to a larger population, but to see whether manipulating the affective content

[81] **M. Singletary**, *Mass Communication Research: Contemporary Methods and Applications* (New York: Longman Publishing Group, 1994), 36.

of a news story will affect subjects' perceptions of risk between samples. Kerlinger notes, "In basic research . . . generalizability is not the first consideration, because the central interest is the relations among variables and why the variables are related as they are."[82] Instead, emphasis is placed on maintaining homogeneity, or similarity, between groups and on controlling extraneous variables.

The merits of randomness have long been touted, and perhaps would arguably be preferable here, if the constraints of time and resources could be removed. On the other hand, little is gained by implementing a national random sample. It can be argued that a national sample, drawn randomly, would only introduce more bias, by importing a host of extraneous independent variables to control. Instead of a relatively homogeneous population such as that which might be found in traditional introductory college courses, there would be respondents from all walks of life – rural, urban, young, old, rich, poor, professional, blue-collar, etc. In trying to control for these differences by breaking results down into these demographics, subgroups become too small to adequately control. When looking for effects, it seems far more preferable to have groups of relatively the same composition.

The chief goal of the experiment is to see whether people respond to changes in the affective tone of a newspaper article by reporting greater or lesser degrees of perceived risk. If this be the case within this sample, then future research might seek to find differences in degree among different social subgroups, for example, more educated subjects versus less educated subjects. While some personal characteristics will be

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[82] **F. N. Kerlinger**, *Foundations of Behavioral Research, 3rd ed.* (Fort Worth, TX: Holt, Rinehart and Winston, Inc., 1986), 299f.

controlled, *e.g.* gender, reading comprehension, and issue involvement, all generalizations will remain confined to the entire group of subjects and not to a larger population.

In a study such as this, with little prior research to indicate whether these effects exist at all, and with no compelling reason to attempt to generalize results to a broader population, isolating a smaller demographic subgroup such as students enrolled in the same course seems to make sense. Not only are time and expense greatly reduced, but the experimenter has tighter control over other variables such as age, income, occupation, and overall life experiences than would be possible using a random sample. To this end, the researcher has checked the homogeneity of group demographics with statistical tests, the results of which are reported in the next chapter.

To explore effects of tonal value on perceptions of risk, different groups were given one of two fictitious news articles dealing with a common risk issue. Both articles contain identical factual information, but the emotional or affective dimension of each one differs from the other. Following this exposure, subjects answered a questionnaire concerning their assessments of various aspects of risk perception. The stories were coded in advance using the DAL. By controlling other variables, any differences in perceptions of risk can be attributed to affective tonal values, or an interaction between tone and other demographics.

Choosing the issue

The rationale for using water quality as the subject over others such as nuclear power, global warming, air travel safety, etc., is manifold:

1. Water is important to everybody to more or less the same degree. We all rely on clean water for drinking and other everyday uses. Few of us, if any, go beyond these general needs.
2. Using water quality, as opposed to other more socially charged issues, makes it easier to eliminate the cultural biases other topics might bring with them. In contrast, using nuclear power, global warming, or another socially charged issue could conjure up too many preconceived ideas about the issue. This would skew results because applying a potential risk of which the subject might already be aware would essentially lead to testing assessments of risk based on these previously held beliefs, rather than based on the tonal values in each story. The idea is to construct the entire risk scenario from scratch and manipulate only the language to elicit effects.
3. Since water is a pervasive issue, stories will more readily appear routine and nondescript while remaining plausible and authentic.

Procedure

Two different mock news stories were constructed for this experiment, using potential risks of bacterial contamination to regional water supply as the storyline. The news takes place in Pikeville, Kentucky, a town north of Knoxville in southeastern Kentucky. Words were selected for manipulation based on the presence of a synonymous

alternative in the DAL that could serve as its counterpart. For example, one sentence contains the clause " . . . to help meet the needs of families in the neighborhood." The words *needs, families,* and *neighborhood* are obviously pleasant word choices, and stand out as a potential candidates for the switch. The less pleasant, more arousing version was then changed to read " . . . to help meet the demands of citizens in the district." The three words changed in this passage and the new versions were these: *needs–demands*, *families–citizens*, and *neighborhood–district*. It should be apparent how the second version is both less pleasant and possibly more arousing (particularly with the *needs–demands* switch). The facts are the same, but the tone of the language used has changed. This was repeated throughout the construction of the mock stories, making changes where possible, substituting more pleasant and less arousing words for their opposites (Table 3.1).[83]

Care was taken in the construction of each article to retain exact uniformity throughout, including aesthetics, number of words, number of paragraphs, photocopy quality, etc. The factual content for both stories is identical, as are sentence structure and syntax. A total of forty-three different words were changed in each article. In an article of 261 words, this constitutes about 16 percent of the total copy. Two words from among these were also chosen for manipulation within the headlines, *discovered* in the "softer" version, and *found* in the more "harsh" article (Figures 3.1 and 3.2).

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[83] These mock news articles were closely patterned after a similar piece by Edythe Jensen of the *Arizona Republic*. "Bacteria Detected in Rural Water; Affects 60 Homes South of Town," 27 August 1997, EV1.

Table 3.1 Words substituted in each story with average Evaluation and Activation Scores

Article I			Article II			Difference
Word	Eval.	Activ.	Word	Eval.	Activ.	
district	1.73	1.34	area	1.63	1.38	.10 / -.04
announcement	2.00	2.00	statement	1.88	2.00	.12 / .00
advise	2.33	1.58	warn	2.00	2.67	.33 / -1.09
undesirable	1.50	1.57	dangerous	1.40	2.61	.10 / -1.04
discovered	2.40	2.09	found	1.60	2.14	.80 / -.05
supply	1.88	1.20	reserve	1.63	1.25	.25 / -.05
existing	2.54	1.71	prevailing	1.90	2.55	.64 / -.84
pollutant	1.12	1.87	bacteria	1.33	1.62	.21 / -.25
revealed	2.18	2.09	found	1.60	2.14	.58 / -.05
after	1.80	1.25	during	1.56	1.56	.24 / -.31
analysis	2.00	2.00	investigation	2.00	2.38	.00 / -.38
twice	2.17	1.60	double	1.89	1.56	.28 / .04
limit	1.50	1.33	limitation	1.25	1.38	.25 / -.05
set	2.00	1.40	fixed	1.67	1.90	.33 / -.50
communities	2.14	1.50	residents	1.57	1.57	.57 / -.07
informed	1.86	1.33	told	1.50	2.20	.36 / -.87
above	2.20	1.25	beyond	1.83	1.63	.37 / -.38
supported	2.57	1.60	adopted	1.71	2.50	.86 / -.90
affected	2.00	1.57	concerned	1.33	1.86	.67 / -.29
households*	2.00	1.30	residences*	1.86	1.71	.14 / -.41
received	2.67	2.00	purchased	2.27	2.45	.40 / -.45
getting	2.00	2.18	purchasing	1.83	2.33	.17 / -.15
needs	1.64	2.18	demands	1.56	2.40	.08 / -.22
families	2.60	1.91	citizens	2.00	2.22	.60 / -.31
neighborhood	2.13	1.63	district	1.73	1.64	.34 / -.01
pure	2.57	1.29	clean	2.25	1.88	.32 / -.59
community	2.29	1.50	municipal	1.80	1.80	.49 / -.30
reservoirs*	2.25	1.38	lakes*	1.86	1.91	.39 / -.53
bear	2.00	2.00	bring	1.80	2.18	.20 / -.18
chance	2.00	1.67	probability	1.58	1.92	.42 / -.25
commonly	1.89	1.40	usually	1.67	1.80	.22 / -.40
refuse	1.40	1.83	waste	1.00	2.20	.40 / -.37
livestock	1.88	1.55	cattle	1.89	1.89	-.01 / -.34
pasture	1.89	1.22	field	1.83	1.69	.06 / -.47
care	2.43	1.50	worry	1.14	2.17	1.29 / -.67
effort	2.33	2.44	push	1.33	2.71	1.00 / -.27
unusual	1.75	1.71	abnormal	1.00	2.00	.75 / -.29
found	1.60	2.14	detected	1.38	2.22	.22 / -.08
attributes	1.75	1.75	blames	1.00	2.38	.75 / -.63
matters	1.50	1.43	problems	1.13	2.00	.37 / -.57
to	1.78	1.57	on	1.38	2.25	.40 / -.68
increasing	2.00	2.27	expanding	1.67	2.71	.33 / -.44
inadequate	1.33	1.00	crude	1.29	1.50	.04 / -.50
Totals	85.85	71.13		69.53	86.86	16.32/-15.73
				Ave. per word diff.		.379/-.366

* These words were made plural although the scores used are of the same words in the singular.

Local water company discovers bacteria

PIKEVILLE, Ky. (UPI) Residents of a rural district south of Pikeville, Ky., will receive an announcement in the mail this week to advise them of potentially undesirable coliform bacteria discovered in their local water supply.

Pikeville Utilities Director William Burke said that existing levels of the bacteria, revealed after a recent analysis are more than twice the limit set by the Environmental Protection Agency.

The Department of Environmental Quality requires that communities be informed when impurities go above state supported levels.

The affected area includes close to 80 households near Chloe, Ky., and Shelbiana, Ky., that once received water from Millstone Water Co.

The city of Pikeville took over the Millstone system last year and began getting water from Carr Creek Water Co. to help meet the needs of families in the neighborhood.

While water drawn from underground sources remains relatively pure, much of the water supplied by community providers still comes from surface water.

Sources such as rivers and reservoirs bear a greater chance of contamination from bacteria and parasites - commonly the result of refuse from livestock and pasture runoff.

Still, the underground aquifers are not always care-free when it comes to the effort for clean water. "It's not unusual for these bacteria to be found in the upper levels of the shallow aquifers we have in this part of the country," Burke said.

He also attributes matters to water systems' increasing reliance on aging pipes and inadequate treatment equipment to make the water safe to drink.

This year marks the 25th anniversary of the passing of the Safe Drinking Water Act.

FIGURE 3.1 – Article 1 substitutes words both higher in evaluation and lower in activation (Group 1).

Local water company finds bacteria

PIKEVILLE, Ky. (UPI) Residents of a rural area south of Pikeville, Ky., will receive a statement in the mail this week to warn them of potentially dangerous coliform bacteria found in their local water reserve.

Pikeville Utilities Director William Burke said that prevailing levels of the polutant, found during a recent investigation are more than double the limitation fixed by the Environmental Protection Agency.

The Department of Environmental Quality requires that residents be told when impurities go beyond state adopted levels.

The concerned area includes close to 80 residences near Chloe, Ky., and Shelbiana, Ky., that once purchased water from Tankard Utilities, Inc.

The city of Pikeville took over the Tankard system last year and began purchasing water from Carr Creek Water Co. to help meet the demands of citizens in the district.

While water drawn from underground sources remains relatively clean, much of the water supplied by municipal providers still comes from surface water.

Sources such as rivers and lakes bring a greater probability of contamination from bacteria and parasites - usually the result of waste from cattle and field runoff.

Still, the underground aquifers are not always worry-free when it comes to the push for clean water. "It's not abnormal for these bacteria to be detected in the upper levels of the shallow aquifers we have in this part of the country," Burke said.

He also blames problems on water systems' expanding reliance on aging pipes and crude treatment equipment to make the water safe to drink.

This year marks the 25th anniversary of the passing of the Safe Drinking Water Act.

FIGURE 3.2 – Article 2 substitutes words both lower in evaluation and higher in activation (Group 2)

When administering the treatment, the researcher gave each class only one story rather than giving part of the group the other version; should students have noticed others in the class reading a different story, they might have begun to guess at the purpose of the study and fabricate answers. In all, a total of nineteen classes were visited, nine of which were given one story, and the remaining ten the other.

A brief questionnaire was stapled beneath the news article and together they were passed out face-down among the students. The researcher asked that the students leave them face-down while a disclaimer was read (see Appendix B, p. 105). Students were then instructed to turn their packets over without skipping ahead, and the instructions were read aloud by the researcher.

Question map

Psychographics

QUESTION 1	Overall cognitive risk assessment
QUESTION 2	$Societal_2$/cognitive risk assessment
QUESTION 3	$Societal_2$/affective risk assessment
QUESTION 4	Overall cognitive risk assessment
QUESTION 5	$Societal_1$/cognitive risk assessment
QUESTION 6	$Societal_1$/affective risk assessment
QUESTION 7	Personal/affective risk assessment
QUESTION 8	Personal/cognitive risk assessment
QUESTION 9	Situation gravity
QUESTION 10	Coverage evaluation (sensationalism)

Demographics

QUESTIONS 11-15	Reading comprehension/retention
QUESTION 16	Concern (involvement index) – Subjects who are more involved with the issue may report higher levels of perceived risk in all categories.
QUESTION 17	Environmentalism (involvement index) – Subjects who actively engage in dialogue
QUESTION 18	Political ideology
QUESTION 19	Environmentalism (involvement index) – Issue education levels
QUESTION 20	Environmentalism (involvement index) – Subjects who drink bottled or filtered water may report higher levels of perceived risk in all categories.
QUESTION 21	Gender – women tend to perceive higher levels of risk.
QUESTIONS 22, 23	Age and academic major

In all, a battery of eight questions pertaining to perceptions of risk were asked, four questions of overall or personal risk, and four of societal risk. Below are two sample questions taken directly from the instrument. The first is an example of personal risk, the second, societal or other-oriented risk perception:

Q: Overall, how safe do you think your water is to drink?

Perfectly safe _____ : _____ : _____ : _____ : _____ : _____ : _____ Not at all safe

Q: If others in Knoxville read this story, how much more worried do you think they will become about the water they drink?

Not at all more worried _____ : _____ : _____ : _____ : _____ : _____ : _____ Very much more worried

Responses were structured in traditional seven-point semantic differential style, with two response extremes placed opposite one another and seven spaces (response options) in-between. In addition, subjects were asked how serious they perceived the issue to be overall, and how sensational they thought the article was.

Six demographics included gender, age, academic major, a five-question test of reading comprehension/retention, a four-question index of overall subject environmentalism, and political ideology (liberal to conservative).

Analysis

These questions represent a three-way perspective of risk: Risk to the self, to proximate others (Knoxville – $societal_1$), and to more distant others (Pikeville – $societal_2$).

The power of affective tone in language to influence perceptions of risk may occur with different strengths at different levels. For example, people may sense the stronger language used but not report higher levels of risk perception to the self; instead they might suppose that others around them will perceive more risk if they read the same passage. Similarly, while they themselves may not worry about the risk issue at hand, they may suppose that others will worry more based on the more arousing reading. The rationale behind each test for effects – what is being looked for and why – should be discussed before proceeding to the results section of this study.

Searching for main effects. A general linear model (GLM) multivariate procedure was used to test for evidence of an overall effect of the language manipulation between groups on responses to the battery of risk-perception measures. The multivariate test (commonly called the Multivariate Analysis of Variance, or MANOVA) provides analysis of variance for multiple dependent variables (the eight perceptions of risk) by one or more independent variables, or covariates. These independent variables divide the overall subject pool into different groups, such as the two experiment groups (Group 1 and Group 2), males and females, issue involvement levels, etc.

Using this general linear model procedure, the null hypotheses of the effects of independent variables (the "Group" effect) on the means of the dependent variables (perceptions of risk) can be tested. In addition, interactions between independent variables, as well as the effects of each of these individually, can be investigated.

This is the most effective test since the data represent responses among different groups and are ordinal in nature. Having only two experimental groups may suggest using a simple t-test over each measurement. However, the MANOVA is a superior method of analysis over individual t-tests because with the latter, Type-I error, the possibility of falsely rejecting a null hypothesis of "no effects," is compounded with each run. The MANOVA tests for overall effects while still controlling Type-I error. If differences are found across all dependent variables (in this case, all eight measures of risk), a subsequent one-way analysis of variance (ANOVA) can be run on each individual question. Results of these tests are reported in the next chapter.

An independent samples t-test was used to compare the mean responses between the two groups to questions of situation gravity (seriousness) and sensationalism. The t-test compares the means of two groups to determine whether the differences between them are simply the result of random chance.

Searching for interaction effects. The multivariate tests were repeated using the demographics as independent variables: age, gender, issue involvement, reading comprehension, and academic major. However, since the purpose of the study is to examine the role of language tone in forming perceptions, main effects from demographic variables are of little importance; the bigger question with these variables is whether there appears to be an *interaction* effect with the language manipulation. For example, finding a main gender effect would be consistent with previous research, but an interaction effect between gender and language could suggest that women are more receptive and open to

the lingual cues and, coupled with a higher risk-perception propensity, experience an even greater effect from the treatment. Finding a main effect of gender would add little to the understanding of how people process and interpret language.

Consider issue involvement in another hypothetical. Respondents who are already highly involved with the issue (those who are environmentally concerned, drink a lot of bottled water, etc.) could potentially be more heavily influenced by the language manipulation than those who are not. Perhaps those already emotionally charged by issues of water quality will show no effects from the language cues; these people might report perceived risk at or near the upper threshold regardless of which version is presented. They may also believe that others are not as concerned about the environment as they are and conclude that they will experience less worry. Similarly, those who are less involved or less concerned with environmental issues might be more open to interpret the text with fewer and less extreme prior attitudes.

Finally, reading comprehension and attention to detail might influence the way subjects process and interact with the affective tonal differences. On one hand, those who read the passage carefully and who retain most or all of the information might be more receptive to the manipulation. On the other hand, those who study the article for content might miss the subtle emotional cues given in the exposure. The logic can work in either direction and thus any results found here or among the other demographics will be considered exploratory and treated as findings *post hoc*.

Results like these would appear as interaction effects. The absence of an interaction effect simply means that language likely processed no differently by people across that particular demographic.

Validity and reliability

Even with sufficient care taken, some bias may eventually creep into the data. A number of methodological choices have the potential to influence the results of this experiment:

Instrument bias – Much of the decision making involved with this study was predicated on the validity of a single instrument: Whissell's DAL. Indeed, this is as much a study of methodology and the efficacy of using the dictionary to analyze various texts as it is a study of emotionality in language. As a result, any shortcomings of the DAL can directly affect the validity of this study, and possibly exponentially. Low numbers of coders and a modest three-point scale were used in the creation of the dictionary, which may have rendered fallacious or at least inconclusive results. An inaccurate list of affective tonal values could mean that the language manipulation in the current experiment is negligible or insignificant. Evidence of effects found in this study is only as good as the instrument it is based on, however, given the previous "successes" of the instrument by its creator, there seems to be merit in testing it again in a different manner, as this study does.

Questionnaire bias – A trial run of an earlier version of the questionnaire, followed by a thorough discussion of its contents, revealed that subjects were, in fact, influenced by a perception of an agenda. When asked whether they would have responded differently if "dummy" questions had been asked, overwhelmingly the answer was "yes." One student added that he thought the study was intended to aid in the sales of bottled water or water purifiers. Some suggested making the first few questions pertain to local water companies, such as "Do you know anyone who works for a local water company?" Another suggestion was to ask if they had become ill in the past as a result of bacteria-contaminated water. Many said that they would be more likely to report much lower levels of perceived risk had the notion of a hidden agenda been set on a different course. Indeed, most remarked with astonishment how malleable they truly are when it comes to answering these questions. The problems of question effects are as old as the oldest survey or questionnaire.

Administrator bias – Another source of bias from a perceived hidden agenda may stem from the appearance of the administrator. If subjects perceive the administrator as being sympathetic to environmental causes based on appearance, they may be more likely to report higher levels of risk and greater concern for environmental issues. Similarly, if subjects perceived the administrator as being more sympathetic toward business, economic development, or overall conservative politics, they may be more likely to report lower levels of risk perception and less concern for environmental issues. For this reason, no one other than the author was permitted to administer the survey. Though this does

not guarantee neutrality, it does keep consistent the experiment conditions for all subjects in both groups.

Subject bias – Some of the subjects arrived to class carrying containers of bottled water. After reading the news article and then being asked to report on their opinions, many of these may have felt additional pressure to report higher levels of risk than they normally might, along with higher levels of concern for the environment. Even though their answers are anonymous, having displayed such an outward testimony of their views on the subject, many of these subjects might have exaggerated the answers they might otherwise have given. By this same rationale, there may be a continuum of appearance-oriented factors that might introduce some form of bias into the study. Students who happened to wear tie-dyed shirts, beads, or other clothing that might identify them as environmentally conscious might to some degree have the same effect.

"Some things I really get nostalgic about now . . . the interminable and exciting debates about our work, over data tables, over coffee tables, and even over cocktail glasses . . . and getting so tired that everything became incredibly funny; and George Suci's spending six months growling over a desk calculator computing our first factor analysis, while we tried to figure out mathematical shortcuts."
–Charles Osgood[84]

4 RESULTS

The fundamental purpose of this study is to determine whether the affective tonal value of a text influences a readership as manifest in its perceptions of risk. To investigate this, two groups were given a news article altered only in tone, not factual content, and were then asked questions about how safe they felt after the reading. The goal of this chapter is to present the findings of that experiment in a way that will clearly answer the basic research questions and provide evidence with which to evaluate the hypotheses.

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[84] **J. G. Snider and C. E. Osgood**, eds., *Semantic Differential Technique: A Sourcebook* (Chicago: Adline Publishing Co., 1969), ix (Introduction by Osgood).

It begins with a summary of the data – a description of the overall experiment sample – then looks at the composition of the two groups separately, statistically comparing them side-by-side to make sure they are similar enough to compare to one another.[85] Finally, statistical tests determine whether there is evidence of differences in perceptions of risk, situation gravity, and sensationalism between the two experiment groups based on the experimental treatment.

Summary of Data

Demographics

Age and Gender. Three hundred forty-eight subjects participated in this study, ranging in age from eighteen to forty-three years old. The mean subject age was just under twenty-two years. One hundred-sixty respondents (46%) were males, 183 (53%) were females, and five subjects did not respond to the questions of age and gender.

Major. The sample of college students participating in this study was drawn from freshman and sophomore introductory courses in English, communication, and sociology. The result was a group that represented a broad range of academic disciplines. Table 4.1 shows the responses chosen from the given list of majors. The largest group of majors came from the social and behavioral sciences, which represented about one-fourth of the

[85] Ascertaining group homogeneity is critical in order to be able to say with any certainty that any differences found are attributable to the experiment control (the language manipulation) and not to other extraneous variables.

Table 4.1 Major

Major	Freq.	Percent	Valid %	Cum. %
Natural Science	5	1.4	1.5	1.5
Biological Science	19	5.5	5.6	7.0
Social/Behavioral Science	89	25.6	26.0	33.0
Engineering	27	7.8	7.9	40.9
Humanities	22	6.3	6.4	47.4
Professions	54	15.5	15.8	63.2
Education	23	6.6	6.7	69.9
Business	56	16.1	16.4	86.3
Other/Undecided	47	13.5	13.7	100.0
Total	342	98.3	100.0	
Missing	6	1.7		
Total	348	100.0		

overall sample. Other groups appear to be fairly generally distributed with the exception of the natural sciences, which comprise less than two percent of the subject pool.

Reading comprehension/retention. To test whether students understood and remembered most of what they read, five questions were asked dealing with certain facts contained in the story (survey questions 11-15, p. 110). For example, one of the more difficult questions asked if they remembered how long it has been since the passing of the Safe Drinking Water Act, which was mentioned at the end of the article (it has been 25 years). On average, subjects were able to answer most of the reading comprehension/retention questions correctly, with 151 respondents (43.4%) answering all five questions correctly, and 103 (29.6%) missing only one question. Only ninety-four respondents (27%) missed two or more questions; two of these missed four questions and none missed all five.

Since these data did not provide much variability, they were collapsed into categories. Those who correctly answered all five questions were considered to have high reading comprehension/retention. Those who missed only one question were considered moderate, and the rest were considered low in reading comprehension/ retention. Table 4.2 shows the new categories.

Political ideology. The distribution of political ideology among both groups was relatively even. Most respondents were neither very liberal nor very conservative; the mean response to this question fell just below the fulcrum, tipping the scales only slightly to the liberal side, at 3.92 on a seven-point scale. The sample seems a bit more moderate than would be expected; nearly sixty-three percent of responses fell between three and five. Still, enough responses appeared toward the ends of the scale to represent all viewpoints (Table 4.3). Figure 4.1 shows the dispersion compared to a normal bell curve.

Table 4.2 Reading Comprehension/Retention

		Freq.	Percent	Valid %	Cum. %
Valid	Low retention	94	27.0	27.0	27.0
	Moderate retention	103	29.6	29.6	56.6
	High retention	151	43.4	43.4	100.0
	Total	348	100.0	100.0	

Table 4.3 Political Ideology

Political Ideology	Freq.	Percent	Valid %	Cum. %
1 - Very Liberal	26	7.5	7.7	7.7
2	35	10.1	10.3	18.0
3	61	17.5	18.0	36.0
4	106	30.5	31.3	67.3
5	55	15.8	16.2	83.5
6	41	11.8	12.1	95.6
7 - Very Conservative	15	4.3	4.4	100.0
Total	339	97.4	100.0	
Missing	9	2.6		
Total	348	100.0		

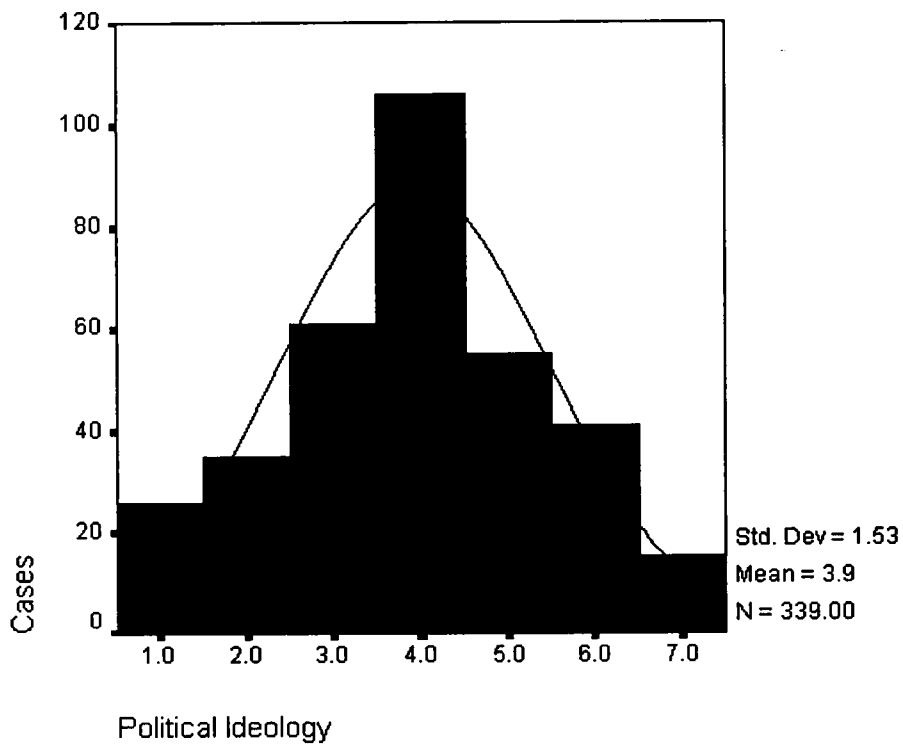


Fig. 4.1 Histogram – Political Ideology

Issue involvement. Four questions dealt specifically with issue involvement: environmental concern, amount of discussion of the issue with friends, amount of water consumed that is bottled or filtered, and level of knowledge of the issue (survey questions 16, 17, 19, and 20, p. 111). Overall reported concern for the environment ranged from one (not at all concerned) to seven (highly concerned), but most responses, 86.6 percent, were four or greater. The mean response was 4.85.

Though overall environmental concern appeared to be high, ratings for how often subjects talked to friends about environmental issues were lower. The mean response for this measure was 3.60, with 67.2 percent responding four or less on a scale from one to seven.

Subjects were then asked to rate how much of the water they drink is either bottled or filtered. On the same scale, roughly 7 percent responded one (none) and 23 percent responded seven (all). Nearly 77 percent of the responses were four or greater, and the mean response was 4.91 (Table 4.4).

Subjects also rated how educated about water quality issues they believe themselves to be, using the same seven-point scale. Overall ratings were lower with this measure, with 78 percent of responses falling at four or less, and a mean of 3.11 (Table 4.4).

These four measures were then factor analyzed producing a one-component extraction, confirming the appropriateness of combining them into an overall index of issue involvement. Since there were four questions pertaining to issue involvement with scales ranging from one to seven, the possible range of overall involvement was from

Table 4.4 Measures of Issue Involvement

	Mean	Std. Dev.
How concerned about the environment	4.85	1.40
How often you talk to friends	3.60	1.72
How much water you drink is bottled	4.91	1.90
How educated about water quality issues	3.11	1.55

Table 4.5 Index of Issue Involvement

	Freq.	Percent	Valid %	Cum. %
Low	126	36.2	36.2	36.2
Moderate	111	31.9	31.9	68.1
High	111	31.9	31.9	100.0
Total	348	100.0	100.0	

four to twenty-eight. These scores were then collapsed into groups of low, moderate, or high involvement, with parameters for each category set to divide the sample into thirds as evenly as possible (Table 4.5).

Perceptions

Perceptions of risk, situation gravity, and sensationalism. The mean responses to the eight measures of risk perception ranged from 3.27 to 5.76 on a seven-point scale, most of which fell above the midway point of four (Table 4.6). The two measures receiving the lowest scores were for questions of personal risk perceptions, ones that directly pertain to the individual respondent. The personal/affective measure gauges how much

the subject himself or herself might worry about the issue. This score is in response to the question, "Having read this news article, how much more worried are you about the water you drink?" and is the lowest of all eight measures of risk (mean = 3.27). The personal/cognitive measure is a cognitive estimation of the safety of the water they drink. This score is in response to the question, "Overall, how safe do you think your water is to drink?" and was the second-lowest scoring measure of risk (mean = 3.39).

The mean response to the measure of perceived overall situation gravity was 5.10, suggesting that subjects overall seem to have considered the issue to be fairly serious. The mean rating of article sensationalism was much lower at 3.79 (Table 4.7).

Table 4.6 Mean Responses to Measures of Risk Perception

Measure of risk perception	Mean	Std. Dev.
Overall – How safe in Pikeville	5.23	1.34
Overall – How safe in Knoxville	4.49	1.46
Personal/Cognitive	3.39	1.52
Personal/Affective	3.27	1.75
Societal (Knoxville)/Cognitive	4.56	1.50
Societal (Knoxville)Affective	4.32	1.53
Societal (Pikeville)Cognitive	5.61	1.45
Societal (Pikeville)Affective	5.76	1.30

Table 4.7 Mean Responses to Measures of Situation Gravity and Sensationalism

	N	Mean	Std. Dev.
Overall, how SERIOUS do you think the situation is?	347	5.10	1.25
How SENSATIONAL do you think this story is?	347	3.79	1.63
Missing variable	1		

In summary, the experimental groups appear to be composed of mostly traditional-aged college students from a variety of academic majors. Most are either very thorough readers or they tended to "study" the article before answering the questionnaire. They are for the most part politically moderate. The trend is to be somewhat highly concerned about the environment and to talk somewhat often about environmental issues with their friends. The better part of the water they drink is either bottled or filtered. They feel a moderate amount of risk associated with water quality, but tend to think that other people feel even more at risk and worry about it more than they themselves do.

The next step is to compare these groups to determine whether there are significant differences among these demographics. If, for example, one group drinks bottled water almost exclusively and the other almost never, any effects that may be discovered might be a function of their involvement, rather than from the language exposure. Before differences in perceptions between groups can be attributed to distinctions in the article they read, the groups must be checked for homogeneity.

Homogeneity of Groups

The best way to isolate and measure any main language effects is to control or eliminate other variables. It is therefore necessary to test the overall demographics of the two groups for significant differences. A chi-square test was used to check categorical demographics and no significant differences were found: gender ($p = .276$), reading

comprehension/retention (p = .636), involvement index (p = .984), and major[86] (p = .108) (Table 4.8).

Separate t-tests were used to compare mean ages and political ideology scores of the two groups. Before testing for age differences, one outlier was first removed – a 43-year-old instructor who voluntarily participated. Results (t = 1.59, df = 341, p = .177) show no significant differences in ages between the two exposure groups (Table 4.9). Similar results were found regarding ideology (t = 1.35, df = 337, p = .180) (Table 4.10).

Table 4.8 Chi-square Test of Demographics between Groups

Demographic	Chi-square	df	Sig. (2-sided)
Gender	1.188	1	.276
Major	11.794	7	.108
Reading Comprehension/retention	.906	2	.636
Issue Involvement	.03	2	.984
N of Valid Cases			343

Table 4.9 T-test for Equality of Variances – Age

Age	N	Mean	Std. Dev.	df	t	Sig. (2-tailed)
Group 1 - Less Arousing/More Pleasant	165	22.13	3.93	341	1.590	.113
Group 2 - More Arousing/Less Pleasant	178	21.46	3.83			

[86] Responses of Undecided/Other were not calculated.

Table 4.10 T-test for Equality of Variances – Political Ideology

Political Ideology	N	Mean	Std. Dev.	df	t	Sig. (2-tailed)
Group 1 - Less Arousing/More Pleasant	165	4.19	1.42	337	1.345	.180
Group 2 - More Arousing/Less Pleasant	178	3.97	1.61			

To conclude, the two groups appear to be similar in terms of demographics, making them suitable to compare for differences in responses to the measures of risk perception. Should differences be found, they are more likely attributable to factors other than demographics.

Tests for Effects

The tests for effects are basically divided into two parts: main effects from the language treatment on dependent variables (perceptions of risk, situation gravity, and sensationalism), and interaction effects of the language and demographics (gender, age, major, etc.) on dependent variables.

Testing for main effects

The primary goal of this study was to test whether the language manipulation for the groups – either the less pleasant/more arousing group or the more pleasant/less arousing group – influenced subjects' perceptions of risk. A main effect found here would indicate that the affective tone of the language used in the treatment of the two groups contributes to the formation of perceptions.

Situation gravity. An independent samples t-test found marginal evidence of a main group effect on perceived situation gravity ($t = -1.767$, $df = 345$, $p = .078$). Group 1 (those who read the more pleasant, less arousing article) reported a mean response of 4.98 to the question, "Overall, how serious do you think the situation in Pikeville is?" The mean for Group 2 (less pleasant, more arousing) was slightly higher at 5.21. This suggests that there may have been some mild effects from the differences in the wording of the two articles, although this is inconclusive (Table 4.11).

Article sensationalism. No evidence was found for differences between the two groups with regard to how sensational they thought their article was (Table 4.12).

Table 4.11 T-test for Equality of Variances – Issue Seriousness

Issue Seriousness	N	Mean	Std. Dev.	df	t	Sig. (2-tailed)
Group 1 - Less Arousing/More Pleasant	169	4.98	1.25	345	-1.767	.078
Group 2 - More Arousing/Less Pleasant	178	5.21	1.24			

Table 4.12 T-test for Equality of Variances – Article Sensationalism

Article Sensationalism	N	Mean	Std. Dev.	df	t	Sig. (2-tailed)
Group 1 - Less Arousing/More Pleasant	169	3.75	1.66	345	-.457	.648
Group 2 - More Arousing/Less Pleasant	178	3.83	1.60			

Perceptions of risk. Since the primary effects are expected to be found in subjects' assessment and perceptions of risk, it is helpful to summarize the means of the two groups and compare them side by side. Table 4.13 simply lists the mean responses of the two groups to the eight questions of risk. As a whole, some potential differences can be seen between the means of Group 1 and Group 2. Perceived risk on the societal levels appears to shift in a direction consistent with the proposition of this study, although measures of personal and overall risk perceptions show little differences.

To first determine whether these potential language effects are significant, a multivariate test (MANOVA) was used to test for significant differences between the two experiment groups across all eight measures of risk perception. An F-value (8, 339) of 2.29 revealed a main language (group) effect, with overall significant differences between the two groups ($p = .021$) (Table 4.14). Using the MANOVA to first look at the overall differences, as opposed to testing each question individually, is statistically superior since

Table 4.13 Comparison of Risk Perceptions between Groups

	Group 1		Group 2	
	Mean	Std. Dev.	Mean	Std. Dev.
Overall - How safe in Pikeville?	5.28	1.41	5.19	1.26
Overall - How safe in Knoxville?	4.56	1.51	4.41	1.40
Personal cognitive risk	3.34	1.56	3.43	1.49
Personal affective risk	3.15	1.75	3.38	1.75
Societal - Knoxville cognitve	4.41	1.49	4.70	1.50
Societal - Knoxville affective	4.12	1.55	4.52	1.49
Societal - Pikeville cognitive	5.41	1.54	5.80	1.34
Societal - Pikeville affective	5.52	1.46	5.99	1.10

running them all separately increases Type-I error and the risk of falsely rejecting the null hypothesis of no effects.

Because significant differences were found between groups on risk perceptions overall, a subsequent one-way analysis of variance (ANOVA) was used to test each of the eight measures of risk perception separately to determine which ones show differences attributable to the language or group treatment. These measures will either support or fail to support the research hypotheses.

Results in Table 4.15 show evidence of a significant main effect from the language exposure with three of the four risk perception measures dealing with societal risk (risk involving others), and marginal support for effects with a similar fourth measure. Significant and marginal differences were found between groups in response to the two measures of perceived societal cognitive risk ($p = .013$; $p = .065$), in at least partial support of research hypothesis 1, that subjects shown copy using words lower in pleasantness and higher in arousal would report higher perceived societal cognitive risk.

Table 4.14 MANOVA – Measures of Risk by Group

Variable	Wilks' Lambda	F	df	Error df	Sig.
Group (across all risk measures)	.949	2.298	8	339	.021

Table 4.15 One-way ANOVA for each Measure of Risk by Group

	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
GROUP	Overall – How safe in Pikeville	.635	1	.635	.355	.552
	Overall – How safe in Knoxville	1.780	1	1.780	.833	.362
	Personal/Cognitive	.640	1	.640	.276	.600
	Personal/Affective	4.342	1	4.342	1.415	.235
	Societal (Knoxville)/Cognitive	7.637	1	7.637	3.422	.065
	Societal (Knoxville)/Affective	13.858	1	13.858	6.023	.015
	Societal (Pikeville)/Cognitive	12.955	1	12.955	6.244	.013
	Societal (Pikeville)/Affective	19.278	1	19.278	11.673	.001

This means that the affective tone of the article appears to have influenced subject responses in terms of how risky they think *others* will estimate the situation to be.

Stronger evidence was found for differences in response to the two measures of societal affective risk ($p < .001$; $p = .015$), in support of research hypothesis 2, that subjects shown copy using words lower in pleasantness and higher in arousal would report higher perceived societal affective risk. This suggests that the affective tone of the article tended to influence the degree to which subjects thought others will *worry* about the situation.

No evidence was found of a main effect from the language exposure in measures of personal risk (risk to self) or overall risk (safety in general), leading to the rejection of research hypotheses 3 and 4, that subjects shown copy using words lower in pleasantness and higher in activation would report higher levels of perceived personal cognitive and affective risk. Simply stated, there were no apparent differences between groups in terms

of how much at risk they perceived themselves to be, or in how much worry they feel about the issue.

Together these findings mean that in general, respondents in Group 2 (less pleasant/ more arousing) tended to report higher degrees of risk perception when estimating the risk of others, or in how much others might worry about these issues. However, they also show that in general, respondents exhibit no significant differences in perceptions of risk to themselves or in how much they might worry about these issues.

Testing for interaction effects

Although there were no *a priori* hypotheses suggesting whether any interaction should occur between the demographic variables and the affect in the language, some exploratory work would be valuable. To this end, the same multivariate test was used to test the null of no interaction effects on all dependent variables across demographics. Whether there is evidence of main effects from demographics is of little concern; only evidence of differences of how different demographics might interact with the language manipulation is of interest.

With the exception of age, all independent variables thus far have been grouped into categories. Most of the subjects participating in this study were traditional-aged students, but a number of respondents had apparently returned to school or otherwise fell beyond the range considered common. It makes sense to collapse these into groups before testing to see whether there are differences between younger college students and older nontraditional ones. Thus the age variable was recoded into groups as follows: Twenty-

one and younger, twenty-two to twenty-five, and older than twenty-five. Again, tests reveal no significant differences between group 1 and group 2 with regard to age.

Situation Gravity. There was no evidence of an interaction effect between the experiment groups and any of the demographic (independent) variables. Interestingly, though, there appeared to be differences between genders in how serious they thought the situation in Pikeville was ($p = .006$). The mean response for females for this question was 5.28 while the mean response for males was 4.89. Subsequent conjecture that females were responding more to the lingual cues proved fallacious; the significance of the multivariate tests of a gender/language interaction left no doubt ($p = .808$). Similar results occurred when testing issue involvement: main effects ($p = .001$) but no interaction ($p = .590$). No other demographics displayed a main effect.

Article sensationalism. There was no evidence of any differences between demographics with regard to how sensational they thought their article was, nor was there any evidence of an interaction between them and the wording of the article.

Perceptions of risk. Results show very little evidence of any main or interaction effects between the demographics and the language manipulation. There was no evidence of main or interaction effects among the two groups with regard to age, gender, or reading comprehension/retention (Tables 4.16, 4.17, and 4.18). Not surprisingly, strong support

Table 4.16 MANOVA – Group by Age

Variables	Wilks' Lambda	F	df	Error df	Sig.
Age	.959	.883	16	660	.589
Group by Age (interaction)	.944	1.217	16	660	.249

Table 4.17 MANOVA – Group by Gender

Variables	Wilks' Lambda	F	df	Error df	Sig.
Gender	.965	1.495	8	332	.158
Group by Gender (interaction)	.986	.581	8	332	.793

Table 4.18 MANOVA – Group by Reading Comprehension

Variables	Wilks' Lambda	F	df	Error df	Sig.
Reading Comprehension	.950	1.085	16	670	.365
Group by Reading Comp. (interaction)	.950	1.098	16	670	.352

($p = .001$) for main effects was found with the issue involvement index, although there was no evidence of an interaction effect[87] (Table 4.19).

Finally, there was no evidence of either a main effect or an interaction (with the language variable) with respect to political ideology, suggesting that respondent politics, whether liberal or conservative, was not a function of how subjects processed and responded to the language manipulation in the treatment articles (Table 4.20).

[87] Main effects for environmentalism will not be explored since they are outside the scope of this study.

Table 4.19 MANOVA – Group by Issue Involvement

Variables	Wilks' Lambda	F	df	Error df	Sig.
Issue Involvement	.878	2.809	16	670	.001
Group by Involvement (interaction)	.944	1.235	16	670	.235

Table 4.20 MANOVA – Group by Political Ideology

Variables	Wilks' Lambda	F	df	Error df	Sig.
Political Ideology	.939	1.310	16	652	.184
Group by Ideology (interaction)	.072	1.462	16	650	.108

"Bearing in mind that the news communicates much more than facts, this examines the affective aspect of the news. The affective dimension deals with the public's emotional response that may result from media coverage. One of the ways that the media exert this affective response is through the narrative structure of the news"
–Salma Ghanem[88]

5 CONCLUSIONS

In all, 348 undergraduate students participated in the study, comprising two relatively homogeneous subject groups. Participants were given either the more pleasant, less arousing version of the article, or the less pleasant, more arousing version, and were asked to give their impressions based on the reading.

Results show a main effect from the language manipulation on subjects' perceptions of risk involving others, but not on perceptions of risk to self. Risk perception levels – mean responses to questions of risk – involving others were significantly higher in the group who read the more arousing and less pleasant article. Subjects who read this article

[88] **S. Ghanem**, 12.

estimated more risk to other people, and they predicted that other people who read the article would see themselves as being at more risk than did the other group. They also thought that others who might read this article would experience more worry about the issue than did subjects who read the "softer" article. Four of the eight measures of risk received strong to marginal support for the presence of a language effect. All four of them dealt specifically with how the subjects thought *others* would respond to the article they read.

One might be tempted to cite Davison's "third-person effect" as the major finding of this study.[89] The third-person effect presumes that people tend to overestimate the effects of media messages on others. The typical rationale for this line of thinking is that people tend to see themselves as more educated, more astute, less vulnerable, etc., and that others who lack this valuable experience and expertise (ostensibly everyone else) are more susceptible to manipulation, deception, etc. Indeed, there is consistently a gap or disparity between answers when people are asked how much they are influenced by the media and how much they believe others are influenced.

This reasoning might not be an adequate interpretation by itself, however, because it ignores the effect the language manipulation had on readers, which was the primary reason for this study. Both groups appear to show a discrepancy in risk perception between the self and others. Indeed, this was expected and is supported by previous research. While a third-person effect was found, this is an inadequate explanation because we would *normally* expect a third person effect, especially in the realm of risk

[89] **W. P. Davison** (1983).

perceptions, where people do, in fact, tend to rate others' perceptions of risk to be higher. If the risk perception levels had remained constant across both groups, with only an equal gap between personal and societal risks *across both groups*, then a traditional third-person effect would be present. Instead, the personal risk measure remained steady across groups, but the societal risks increased from Group 1 to Group 2. Since other variables were controlled, this difference can be attributable to the effects of the affective tone in language used in reporting the issue. There is a third-person effect, but the effect is greater where language is more arousing and less pleasant; that the groups estimated risk in accordance to which article they read is significant.

It should not be surprising that subjects overall show no differences in terms of estimated risks to self. Many people even tend to see themselves as impervious to most risks in general. They live in flood plains and on faultlines. They believe people should wear seatbelts but seldom do themselves. They smoke cigarettes. They drive fast and own handguns. Why, then would we assume that their perceptions of risk to self are so malleable as to be altered by the subtle tones of the reporter language?

It is also interesting that while no effects were found for gender on risk, either main or interaction, females did tend to perceive the situation as more serious, regardless of which article they read. Any attempts to explain this from these data would be speculative, although it was suspected (not hypothesized) that women might somehow be more attuned to the emotional content of a story, perhaps tempting some to expect an interaction effect between gender and language, particularly when dealing with risk. There was entirely no support for this line of thinking.

There were no differences across the board with regard to how sensational they thought the article was. One possible explanation for this might be the relative nature of the term. To read a lone newspaper article and then decide whether it is sensational is difficult. It is likely that had the subjects seen both articles, they could more reasonably assess how sensational one was in comparison with the other.

The only demographic that appeared to be a function of actual risk perception was the index of issue involvement, although no interaction effect was discovered. The main effect of involvement is not surprising; asking how much of the water they drink is bottled and how often they talk to friends about environmental issues is very close to asking them how at risk they feel about environmental issues, especially water quality issues. The fact that issue involvement as an independent variable appears to influence risk perceptions makes sense. What was more central to the study was whether those more involved displayed a different interaction with the language used in the article. It was wondered, for example, whether those more involved would experience less influence from the linguistic cues, the reasoning being that those highly involved or highly concerned would probably sound the alarm no matter how "soft" the language. Again, there was no support for an interaction effect.

Interestingly, no effects for reading comprehension/retention were found. The rationale for expecting results here went both ways. On one hand, it was thought that perhaps those who only "skimmed" the article might concern themselves less with the actual facts of the story and, consequently, perhaps be more responsive to the emotional content. On the other hand, it could be argued that those who read and studied every

detail of the story attended to the message more fully, which could result in a greater effect from the treatment. Conjecture either way sounded at least plausible as an interaction effect, although neither received any statistical support.

In summary, the results of this study show an exclusive main effect of tonal values on societal-level perceptions of risk across all demographics. The absence of interaction effects suggests that most subjects, regardless of age, gender, political ideology, issue involvement, etc., tended to respond to the language in much the same way. Liberal subjects, for example, displayed no significantly different response to the language than did conservative subjects. Further, while subjects in both experiment groups tended to have similar perceptions of risk to the self, those in the more arousing/less pleasant group (Group 2) tended to project somewhat higher levels of risk and more worry when considering the views others might have.

Perspective

This experiment represents a more pragmatic approach to finding effects from tone because it incorporates realistic news articles differing only in the subtle ways one would expect two articles (from different perspectives) to differ. Rather than changing only one or two key words that would drastically change the complexion of a news article (as Tversky and Kahneman did using "will be saved" and "will die"), this study substituted words that are more or less synonymous but which carry slightly different tonal values. This procedure makes this study unique, and one that suggests that readers perceive and respond to the tone of language used within a news story.

Using a risk issue was only one way of eliciting differences between two readerships. Other arenas of public opinion can and should be studied for effects – coverage could involve the approval for public funding, for example: stories could be altered in tone and then subsequent approval rates between groups explored. Other studies could use political candidate support, issue agreement or disagreement, or special event assessment instead of risk issues.

The rationale for this study started out as an armchair theory about two years ago. The author and a fellow graduate student were working on a study of framing involving another environmental issue, dioxin. One of the phases of the investigation consisted of counting word frequencies of issue coverage, comparing one time-frame with another. During the analysis, words appearing more frequently in one file over the other percolated to the top of the list. The differences in "frames" between these temporal groupings were telling in ways not addressed in that particular study, but which continued to inspire and provide motivation for this exploration.

The results of that first study were provocative. Words appearing more frequently in one time period had a different "feel" or tone to them than did the ones in another time period. What was once a skin "rash" or "condition" later became a skin "disease" (at times even a *violent* skin disease). What was once a suspected carcinogen later "caused cancer" or was "potentially deadly." Words like *waste*, *toxic*, *contaminate*, and *dumping* appeared more frequently during this later time period and coverage was found to be

more inflammatory.[90]

It became somewhat of a speculation then that readers might be responding to these more "harsh" words as much as they were to the actual information content of the coverage. Could it be that reporters introduce their own biases merely by the choices they make over which words to use? Do reporters approach the story with a certain posture, a certain disposition, toward the people and the issues about which they are writing, and further, is that attitude manifest in the copy they write by the positive or negative words they choose to include? And perhaps more importantly, are readers sensitive to the tone of language a writer uses? Are the resultant attitudes formed by readers influenced by these positive or negative emotion-laden cues? These were the questions that needed to be tested, and they form the research questions for the present study almost verbatim.

The impetus for this study was in place. It was not long before I discovered the work of Cynthia Whissell, though almost exclusively in psychology journals. It was encouraging to find a scholar who not only studies the affective tonal values of text, but who also had compiled a list of thousands of words, each with scores indicating their "connotative" meanings. Whissell had devised an instrument that with the help of a computer could render a measure of the overall tone of a document.

The principal goal of this paper was to attempt to apply Whissell's linguistic work to communication studies, particularly as it might elucidate research on issue framing. To

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[90] **G. Wilson and P. Crandon**, "News framing of dioxin as an environmental risk: When the New York *Times* downplayed the threat," Paper presented before the Newspaper Division, AEJMC Southeast Colloquium, New Orleans, March 14, 1998.

this end, I wondered whether reader perceptions could be influenced by providing them texts of different affective tones. If a study demonstrated this effect, it would offer some support for the methodological value of Whissell's Dictionary of Affect in Language. Responses surrounding a particular risk issue seemed to be a sensible place to begin looking for language effects.

Theoretic Implications

To understand the media's role in shaping public perceptions is to understand only a small piece of the public opinion puzzle. Most scholars recognize that the process of public opinion formation is multidimensional and involves a number of agencies. Mayer points to four major players in the process: political leaders, political parties, interest groups, and the mass media.[91] This grouping of public opinion shapers shows how the media are but one agency among several with the power to impact how people respond to the myriad issues that face them. He points out, however, that most Americans have little direct experience with politicians, for example, or with political parties, or interest groups; few people know first-hand about government spending or the personal lives of presidents, and few have been to the former Soviet Union. Beyond our own first-hand experiences, we must rely on the media to help us interpret our own realities.[92] "Once we have ruled out personal experience," Mayer states, "all of our knowledge of external

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[91] **W. G. Mayer**, *The Changing American Mind*, (Ann Arbor: University of Michigan Press, 1992) 281.

[92] Mayer concedes that much of the information we receive from the media comes indirectly through interaction with others. This is known as the "two-step flow" of mass communication.

events necessarily comes from the media. Any change in public opinion caused by such knowledge can therefore be labeled as 'a media effect.'"[93]

This is an awesome responsibility heaped on the shoulders of the media. Even if the American mass media system were perfect, and reporters and editors became merely passive conductors of unbiased, accurate information, the "media effects" of this system and its noble task of disseminating critical information would still be immense. Mayer calls this kind of media effect "informational effects."[94]

Another less admirable type of media effects is what Mayer calls "packaging effects."[95] These effects are what result after the media do what they do: package news for mass consumption. In this process, issues get overplayed or underplayed. A snippet of video runs over and over. A buzzword gets picked up by the papers or networks and becomes an over-simplified label, the use of which can lead to over-simplified conclusions. Reporting the *whole* truth is an impossibility; media are forced to present only an abridgment – abstractions of the truth. Not only do imperfect people decide what news content to include or exclude, they also decide how to deliver it. Mayer points out that it is the editors who decide what to lead with or which stories get front page treatment; they decide which sources to use and whether to treat them as credible.[96]

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[93] Ibid., 286.

[94] Ibid.

[95] Ibid., 287.

[96] Ibid., 283.

Even the everyday journalist contributes to the "packaging effects" of the media, for this person is the one who actually composes the news, choosing the content to include or exclude, and making scores of micro-decisions over each word, each sentence, each frame of video. And not all of these decisions rest on sound, responsible journalistic practices. A documentary called "Trial by Television" ran on a cable network that discussed how the media cover courtroom drama. Beyond the usual dialog about media abuses and the inability to render a fair trial because of overblown media coverage came an interesting observation from a judge. He complained that he could run a solid courtroom for eight hours in a day, showing perfect form in jurisprudence, but that the moment he reached to scratch his nose, he could count on seeing himself on the six o'clock news that evening with a shot of him picking his nose.[97]

The point is that this is what journalists do best: they not so much convey the news as *package* it. And the common newswriter, whether in print or broadcasting, inherently shares in that power to shape public opinion by the sheer fact that he or she composes the news. Theirs is an art that is full of subjective human judgment calls. No composition is value-free or without bias, in part because it is an abstraction of the matter it covers (not everything is included), in part because it is mediated (seeing something on television or in the papers is inherently different than experiencing it first-hand), and also in part because the language used within the story is neither value-free nor without bias. In fact, in discussing how the media influence public opinion, Mayer includes "word choice" and

[97] *Trial by Television*, Arts and Entertainment Television, 1997.

"tone" as factors, and names "personal ideologies and prejudices of the journalists" as sources of this bias.[98]

Those in the news business cannot not frame; framing the news is inescapable. It is a continuous and unavoidable part of the process of generating news. Understanding how the affective tonal values of the language used in news coverage influence public perceptions helps us arrive at a clearer understanding of the power of the media and helps provide more lucid answers to the questions of overall media effects. This study hopes to provide one of the crucial first steps toward this end.

On a theoretic level, a chief objective of this study was to elaborate on the presence of an affective dimension within the media frame. Ghanem wrote of the cognitive and affective dimensions of frames using the analogy of the picture frame. The cognitive elements include what is held within that frame, and the affective elements comprise the frame itself: "An ornate picture frame sets a very different tone for a painting than a simple rustic frame."[99] This study attempts to provide a more complete description and understanding of this affective dimension of media frames. It advances the state of frame theory by depicting language tone as an affective component of the overall media frame, by describing news composition as an integral part of the framing process, and by further developing the concept of an "affective frame," which is the complement of the cognitive frame described by Ghanem.

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[98] **W. G. Mayer**, 283.

[99] **S. Ghanem**, 10.

This research gives some credence to the supposition that an affective frame can be identified and measured within a news text, and that this frame is conveyed to and influences the perceptions of a readership. It addresses the different aspects of frames and the framing process, and the impossibility of value-free reporting. It also discusses further the process of news consumption and how readers interact with news coverage.

Practical Implications

Part of the reason for undertaking this project was to test the efficacy of using Whissell's DAL to measure the affective elements of a news story. Whissell's dictionary represents years of research, numerous hours of test administration and coding, and a host of studies in search of cross-validation and internal methodological rigor. These efforts have produced a list nearly 10,000 words long, each with a score for two dimensions – evaluation and activation – and represent the continuation of the work started by Osgood and others a half century ago. There is corroborating evidence that seems to validate the instrument; it was repeatedly able to replicate by computer results that were previous found critically or by hand. Stylistic matters relating to tone and to word and sentence length can distinguish one author from another. Differences in advertising copy were found using the DAL that made good sense intuitively (that advertising aimed at men tends to be more arousing and less pleasant).

However, one drawback to Whissell's work is perhaps the lack of attention it has received outside its own niche; few if any scholars outside Whissell's group have tested the efficacy of the DAL. Certainly it is beneficial to have scholars from other areas and

backgrounds such as communication and sociology investigate these new measures and techniques independently. This study is one attempt to begin the process of assimilation of this work from one discipline into another.

One way others might pay more attention is if additional studies place more emphasis on addressing the question of effects: Does the affective tonal value of a text influence reader responses? And further, can Whissell's DAL be shown to be an accurate measure of affective tonal values? At least part of what remained to be tested before future researchers could begin to embrace this methodology was whether readers are in fact able to perceive these subtle differences in tone, and whether they have any effects on reader perceptions. These were the primary questions this study set out to answer.

The support received for at least half of the hypotheses suggests two things: First, that readers do pick up on an emotional element of the language used in a news article. Second, since the manipulation was based solely on the DAL, and at least some of the differences noticed between responses are consistent with the hypotheses, then at least some validity of the measures of tonal value comprising the DAL can be inferred. While further study is still needed, we are perhaps a bit closer not only to trusting the validity of the instrument, but also to recognizing the importance of any results we may find using it.

The potential applications of the dictionary are abundant. Scholars can use it to measure the affective tonal value of a text. Coverage from a source can be examined over time or compared to news from another source. Measures of sensationalism can be developed with the help of such instrumentation. Studies in persuasion can include affective tone when measuring the effectiveness of a message or campaign. Public

relations and advertising professionals can begin to measure the tone of the language they use in their communications, and can even consult the dictionary to measure the tone of a message before its dissemination.

Limitations and Suggestions for Further Research

Ironically, the chief limitation of this study is the use of the dictionary itself. Many of the words that were substituted in the two articles are only marginally different in tone. The instrument reports only means and not the variances between those subjects who rated each of its entries. It is not possible to discern whether one word, with a rating of say, 2.21, is significantly different from another word with a rating of 1.98. Therefore, the words used in the two articles in this study might well be very similar in affective tone. If the variance between subjects who rated the words in the DAL were provided, standardized ratings (z-scores) for each word could be found. This would greatly enhance the precision of the current study; as it is, any number of the forty-three words in the manipulation could in actuality be virtually synonymous in terms of their affective tone. What if half or more of the words used in the two articles add nothing to the manipulation? Then there would be twenty words or more that contribute nothing to the results. Perhaps the differences found in this investigation are due to the effects of only a handful of words. It would be better to be able to say that ten words alone evoked differences than it is to say that some of the forty-three might have.

Another criticism of the DAL that should be mentioned is its use of very low numbers of coders who rated each of the thousands of words. The maximum number of

coders for any one word was eight, and they all were undergraduate psychology students. Even if there were dozens of subjects to rate each word, a strong argument can be made against it if only undergraduate students at a regional university in Canada are used. Does the word "healthy" convey the approximate same affective tone to older citizens as it does to those who are college-aged? Does the word "employment" mean the same thing affectively to people from different socioeconomic backgrounds? Though attempts have been taken by its creator to demonstrate instrument validity, low numbers of word raters might be a source of bias for the DAL. In fairness, however, it should also be pointed out that the present study also incorporates undergraduate students, in this case from a Southern university and thus any sensitivity to the affective content of a news story cannot be assumed to exist within different populations.

A further limitation of this study might be its use of risk perceptions as a means of testing the effects of language tonal values. It seemed to be a good place to start, although it might not have been the best place to search for effects. For example, it was known ahead of time that people tend to estimate their own risk as much lower than they do others' risk. It seems reasonable that people's assessment of potentially hazardous situations might be relatively resistant to non-immediate factors such as the tone of language used to communicate about that situation. Perhaps the next study could look at coverage of a local political issue, such as a sales tax increase, and look for differences in approval rates. Or possibly the tone of coverage of a local special event could be

manipulated and then subsequent perceptions of event magnitude and event success be compared.[100] Virtually any form of public opinion can serve as a testing mechanism.

Another limitation inherent in survey research is that of question effects. Respondents will tend to answer questions how they suspect the researcher might *want* them to answer. In a classroom environment, using a stapled questionnaire with instructions at the top, with items including questions of reading retention, it is hard for the student to completely shed the test-taking disposition. Students have been conditioned to try to give the "right" answers. They also feel pressure to make their responses internally consistent. A high rating on the first question can set them in motion rating *every* item as high. A simple rearranging of the question order might have yielded different results.

Even so, every attempt was made in the course of this study to create questions that are succinct, direct, and unambiguous. Each student was subjected to the same conditions. While controlling for these extraneous variables, the study was reasonably able to accomplish what it set out to do: isolate and measure the effects of affective tonal values on risk perceptions within a newspaper readership.

Future studies should replicate results using different issues. A major goal of any future studies should be to measure the effects of tonal values on readers. It may be found that effects are consistent but relatively weak in strength. Or perhaps results will

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[100] The media are often accused of being what is called a "booster press." Events that take place downtown are often covered only positively by local papers and TV stations. Events are always a huge success and crowds are always big. Does affective tone play a part in this? Possible questions for subjects in this study include, How successful do you think this event was? and How happy with the turnout do you think the event coordinators are? See **T. Koch**, *The News as Myth*, (New York: Greenwood Press, 1990).

vary greatly from none at all to wild perceptual changes. These questions should be addressed before any generalizations about tonal qualities can be made.

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APPENDICES

Appendix A – Factor Analysis

Initial Factor Analysis of Osgood's 50 Semantic Scales

Semantic scale	Evaluation	Potency	Activity	Residual
1. good-bad	.88	.05	.09	.09
2. large-small	.06	.62	.34	.04
3. beautiful-ugly	.86	.09	.01	.26
4. yellow-blue	-.33	-.14	.12	.17
5. hard-soft	-.48	.55	.16	.21
6. sweet-sour	.83	-.14	-.09	.02
7. strong-weak	.19	.62	.20	-.03
8. clean-dirty	.82	-.05	.03	.02
9. high-low	.59	.21	.08	.04
10. calm-agitated	.61	.00	-.36	-.05
11. tasty-distasteful	.77	.05	-.11	.00
12. valuable-worthless	.79	.04	.13	.00
13. red-green	-.33	-.08	.35	.22
14. young-old	.31	-.30	.32	.01
15. kind-cruel	.82	-.10	-.18	.13
16. loud-soft	-.39	.44	.23	.22
17. deep-shallow	.27	.46	.14	-.25
18. pleasant-unpleasant	.82	-.05	.28	-.12
19. black-white	-.64	.31	.01	-.03
20. bitter-sweet	-.80	.11	.20	.03
21. happy-sad	.76	-.11	.00	.03
22. sharp-dull	.23	.07	.52	-.10
23. empty-full	-.57	-.26	-.03	.18
24. ferocious-peaceful	-.69	.17	.41	.02
25. heavy-light	-.36	.62	-.11	.06
26. wet-dry	.08	.07	-.03	-.14
27. sacred-profane	.81	.02	-.10	.01
28. relaxed-tense	.55	.12	-.37	-.11
29. brave-cowardly	.66	.44	.12	.03
30. long-short	.20	.34	.13	-.23
31. rich-poor	.60	.10	.00	-.18
32. clear-hazy	.59	.03	.10	-.16
33. hot-cold	-.04	-.06	.46	.07
34. thick-thin	-.06	.44	-.06	-.11
35. nice-awful	.87	-.08	.19	.15
36. bright-dark	.69	-.13	.26	.00
37. bass-treble	-.33	.47	-.06	.02
38. angular-rounded	-.17	.08	.43	.12
39. fragrant-foul	.84	-.04	-.11	.05
40. honest-dishonest	.85	.07	.02	.16
41. active-passive	.14	.04	.59	-.02
42. rough-smooth	-.46	.36	.29	.10
43. fresh-stale	.68	.01	.22	-.11
44. fast-slow	.01	.00	.70	-.12
45. fair-unfair	.83	.08	-.07	.11
46. rugged-delicate	-.42	.60	.26	.27
47. near-far	.41	.13	.11	-.05
48. pungent-bland	-.30	.12	.26	.05
49. healthy-sick	.69	.17	.09	.02
50. wide-narrow	.26	.41	-.07	-.11
Percent of Total Variance	33.78	7.62	6.24	1.52
Percent of Common Variance	68.55	15.46	12.66	3.08

Appendix B – Instrument

(Read aloud – no copy furnished to the participants)

Pass out packets – FACE DOWN.

READ AFTER PACKETS ARE PASSED OUT BUT BEFORE BEGINNING.

Dear Participants:

We hope you will agree to take a few minutes of your classroom time to participate in the research project involving newswriting.

The activity will involve reading a newspaper article and then commenting on your opinions about what was read.

You are not required to participate and you will not be penalized for not participating. At the same time, we believe the information you can contribute will be helpful to understanding the topic being studied.

Please be open and candid with your responses, and remember, no one's responses will be singled out. Your answers can't be traced back to you – they are anonymous.

And finally, I want to remind you that we represent none of the parties mentioned in the article.

*********SKIP TO INSTRUCTIONS********

Remind them to relax. This is not a test.

READ AFTER PACKETS ARE COLLECTED.

We thank you very much for your participation in this study. Since other students will be participating in this study, a full debriefing of disclosure of the nature of this project is not appropriate at this time.

However, in about 1 week your instructor will be given full details that can then be read to the class or otherwise be made available for your inspection.

Remember, the results of the study will remain anonymous. And again we thank you very much for your time in participating in this worthwhile study.

*********CONCLUDES THE STUDY********

Instructions *– Below is a newspaper article and stapled to it a questionnaire. Please read the article at your own pace and then go ahead and flip to the next page and begin answering the questionnaire. Do not refer to the article again while completing the survey.*

In answering the questions, please base your judgments on the news article you are about to read. Your opinions are important, and remember, there are no right or wrong answers. Some of the questions may seem repetitive; ***please read them carefully*** *so you can sense the subtle differences in each. Questions should be answered in sequence – please do not skip around.*

Local water company discovers bacteria

PIKEVILLE, Ky. (UPI) Residents of a rural district south of Pikeville, Ky., will receive an announcement in the mail this week to advise them of potentially undesirable coliform bacteria discovered in their local water supply.

Pikeville Utilities Director William Burke said that existing levels of the bacteria, revealed after a recent analysis are more than twice the limit set by the Environmental Protection Agency.

The Department of Environmental Quality requires that communities be informed when impurities go above state supported levels.

The affected area includes close to 80 households near Chloe, Ky., and Shelbiana, Ky., that once received water from Millstone Water Co.

The city of Pikeville took over the Millstone system last year and began getting water from Carr Creek Water Co. to help meet the needs of families in the neighborhood.

While water drawn from underground sources remains relatively pure, much of the water supplied by community providers still comes from surface water.

Sources such as rivers and reservoirs bear a greater chance of contamination from bacteria and parasites - commonly the result of refuse from livestock and pasture runoff.

Still, the underground aquifers are not always care-free when it comes to the effort for clean water. "It's not unusual for these bacteria to be found in the upper levels of the shallow aquifers we have in this part of the country," Burke said.

He also attributes matters to water systems' increasing reliance on aging pipes and inadequate treatment equipment to make the water safe to drink.

This year marks the 25th anniversary of the passing of the Safe Drinking Water Act.

Instructions *– Below is a newspaper article and stapled to it a questionnaire. Please read the article at your own pace and then go ahead and flip to the next page and begin answering the questionnaire. Do not refer to the article again while completing the survey.*

In answering the questions, please base your judgments on the news article you are about to read. Your opinions are important, and remember, there are no right or wrong answers. Some of the questions may seem repetitive; ***please read them carefully*** *so you can sense the subtle differences in each. Questions should be answered in sequence – please do not skip around.*

Local water company finds bacteria

PIKEVILLE, Ky. (UPI) Residents of a rural area south of Pikeville, Ky., will receive a statement in the mail this week to warn them of potentially dangerous coliform bacteria found in their local water reserve.

Pikeville Utilities Director William Burke said that prevailing levels of the polutant, found during a recent investigation are more than double the limitation fixed by the Environmental Protection Agency.

The Department of Environmental Quality requires that residents be told when impurities go beyond state adopted levels.

The concerned area includes close to 80 residences near Chloe, Ky., and Shelbiana, Ky., that once purchased water from Tankard Utilities, Inc.

The city of Pikeville took over the Tankard system last year and began purchasing water from Carr Creek Water Co. to help meet the demands of citizens in the district.

While water drawn from underground sources remains relatively clean, much of the water supplied by municipal providers still comes from surface water.

Sources such as rivers and lakes bring a greater probability of contamination from bacteria and parasites - usually the result of waste from cattle and field runoff.

Still, the underground aquifers are not always worry-free when it comes to the push for clean water. "It's not abnormal for these bacteria to be detected in the upper levels of the shallow aquifers we have in this part of the country," Burke said.

He also blames problems on water systems' expanding reliance on aging pipes and crude treatment equipment to make the water safe to drink.

This year marks the 25th anniversary of the passing of the Safe Drinking Water Act.

QUESTIONNAIRE

1 Please estimate how safe to drink you think the tap water in the Pikeville area is as a result of the events reported in the news article?

Perfectly safe _____ : _____ : _____ : _____ : _____ : _____ : _____ Not at all safe

2 People in Pikeville will make their own estimation. How safe will they estimate their water to be as a result of the events reported in the news article?

Perfectly safe _____ : _____ : _____ : _____ : _____ : _____ : _____ Not at all safe

3 Whether people in Pikeville think the water is safe to drink or not, how worried do you think they will become about the water after reading this article?

Not at all worried _____ : _____ : _____ : _____ : _____ : _____ : _____ Extremely worried

4 How likely is it that a situation like the one in Pikeville will also occur in Knoxville?

Not at all likely _____ : _____ : _____ : _____ : _____ : _____ : _____ Highly likely

5 If others in Knoxville read this story, how much more likely are they to think their water might also become unsafe to drink in the future?

Not at all more likely _____ : _____ : _____ : _____ : _____ : _____ : _____ Very much more likely

6 If others in Knoxville read this story, how much more worried do you think they will become about the water they drink?

Not at all more worried _____ : _____ : _____ : _____ : _____ : _____ : _____ Very much more worried

7 Having read this news article, how much more worried are you about the water you drink?

I'm not at all more worried _____ : _____ : _____ : _____ : _____ : _____ : _____ I'm very much more worried

8 Overall, how safe do you think your water is to drink?

Perfectly safe _____ : _____ : _____ : _____ : _____ : _____ : _____ Not at all safe

9 Overall, how serious do you think the situation in Pikeville is?

Not at all serious _____ : _____ : _____ : _____ : _____ : _____ : _____ Extremely serious

10 How sensational do you think this news story is?

Not at all sensational _____ : _____ : _____ : _____ : _____ : _____ : _____ Very sensational

11 Do you remember what was found in the local water supply?
- a. Waste products
- b. Bacteria
- c. Viruses
- d. Carcinogens

12 How much over the limit were the detected levels?
- a. Twice the limit
- b. Three times the limit
- c. Five times the limit
- d. Ten times the limit

13 According to the article, how many families might be affected?
- a. Close to 20
- b. Close to 40
- c. Close to 60
- d. Close to 80

14 In addition to treatment equipment, what did the article say was a factor?
- a. Old pipes
- b. Limestone
- c. Faulty valves
- d. Global warming

15 How long has it been since the passing of the Safe Drinking Water Act?
- a. 20 years
- b. 25 years
- c. 30 years
- d. 50 years

16 How concerned about the environment do you consider yourself to be?

Not at all concerned _____ : _____ : _____ : _____ : _____ : _____ : _____ Highly concerned

17 How often do you talk to your friends about environmental issues?

Never _____ : _____ : _____ : _____ : _____ : _____ : _____ Very often

18 In terms of political ideology, how would you identify yourself?

Very liberal _____ : _____ : _____ : _____ : _____ : _____ : _____ Very conservative

19 How educated would you say you are about water quality issues?

Not at all educated _____ : _____ : _____ : _____ : _____ : _____ : _____ Very educated

20 Of the water you drink, how much of it is bottled or filtered?

None _____ : _____ : _____ : _____ : _____ : _____ : _____ All

21 What is your gender?

❒ Male ❒ Female

22 How old are you? _____

23 What is your major? (choose the one that **best** fits)

a. Natural Science
b. Biological Science
c. Social/Behavioral Science (Sociology, Psychology, Anthropology, etc.)
d. Engineering
e. Humanities (English, Foreign language, Philosophy, etc.)
f. Professions (Communications, Law, Social work, etc.)
g. Education
h. Business
i. Other/Undecided

VITA

VITA

Paul Crandon was born in Huntsville, Alabama, on December 28, 1966. He spent most of his childhood in Derby, Kansas, attending grade school and high school there, and graduating from Derby High School in 1985. He attended Pittsburg State University where he studied public relations and business, earning a Bachelor of Arts degree in 1989 and a Master of Arts degree in 1991. He worked in public relations and later college admissions until his entrance into the doctoral program at the University of Tennessee in the fall of 1995. He has enthusiastically accepted a position at Northwest Missouri State University where he will teach communication and public relations courses.