Abstract

In this paper, I consider the satellite-framed language English, and how a network of Manner components conflated in the verb roots correlate in the Speaking event. I model a radial network of the components that have been judged as pertinent by native respondents. It becomes evident that the Effect on the Hearer is constrained by the Speaker’s Intention and the Speaker’s Attitude, but how do the other Manner components behave? The further objective of this study is to verify how the semantic-pragmatic and physical-auditory verb component Manner information interfaces to reveal the category structure. To understand this, I selected two groups of verbs belonging to opponent Manner of Speaking verb attitudes: “friendly” and “critical”. Each group consists in eleven verbs. I evaluate the verb assessment of ten respondents for the set of verbs and correlate the various distinguishing aspects that emerge through the application of GraphColl.

Key words: Categorization, Manner of Speaking, Radial network, GraphColl, English Satellite-framed language, Negativity bias

1. Introduction - Manner in a Satellite-framed language

Studies confirm typological differences between languages and the characteristic patterns in which the conceptual structure of an event is mapped onto syntactic structure (Talmy 1985, 2000a, b; 2008). In this paper, I consider the satellite-framed language English, and the elaboration of Manner1 in the Speaking event. It is well known that as a satellite-framed language English characteristically expresses Manner components conflated in the verb root, whereas the Path of the event is generally expressed by a Prep-Sat2. Recent studies of Manner have carried over from Manner of Motion

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1 All of the components of the Speaking event are presented with the initial capitalized to separate them from concepts in small caps, specifications of the components are between quotation marks, and examples are in italics.

2 Though I recognize the relevant difference between a preposition and a satellite (Talmy 2008: 389–390), I prefer to use the abbreviation Prep-Sats to group both prepositions and/or satellites, as confirmed by Leonard Talmy in a personal communication at the 13th International Cognitive Linguistics Conference (ICLC-13), Northumbria University, Newcastle (UK), 2015 (see also Sandford et al. 2016:4).
(MoM) to Manner of Speaking (MoS). These studies have helped distinguish the typological differences between satellite-framed vs. verb-framed languages and the continuum between the two types. Verb-framed languages, contrary to satellite-framed, favor constructions in which Path is conflated in the verb root and Manner is expressed in an adverbial or a gerundive adjunct construction. Talmy’s original work identifies this two-category typology on the basis of the typical pattern in which the conceptual structure of a Motion event is mapped onto syntactic structure.

Manner has been discussed in by numerous linguists who identify specific perspectives, see for example Jackendoff (1983: 53); Evans & Green (2006: 63); Flaux & Moline (2009: 3). Manner has been studied in different languages with a general focus on its syntactic realization. One main approach is Talmy’s, and the other principal approach is lexical semantic, see for example Levin & Rappaport Hover 1992, 1998, 1999; Levin 1993; Levin, Beavers, & Tham 2009. This study endorses Talmy’s semantic cognitive-typological approach (1985, 2000b, 2007). In this approach, Manner is one of the six conceptual components for the description of a Motion event. They include: MOTION, FIGURE, GROUND, PATH, MANNER, and CAUSE; see example 1 (Sandford 2016: 83). Manner is considered a secondary action or state that an Agent (or a Patient) manifests simultaneously with its main action or state. In this case the traditional ‘motion’ action is substituted by the ‘speak’ action.

(1) Clark shouted his wish down into the well.

AGENT/SOURCE SPEAK + MANNER FIGURE PATH GROUND

The aim of this paper is to see how English Manner of Speaking (MoS) verb components expressed in the verb root correlate according to respondent judgement. The specific objective is to see if I can construct a radial network to visualize and measure the relationship between the Manner components of a specific set of English MoS verbs with the use of GraphColl. I develop the model by using a series of responses to online questionnaires that asked respondents which of ten Manner components they felt were indicative of a specific MoS verb. To illustrate if this was possible I selected two groups of opponent-attitude verbs — “friendly” e.g. chat, schmooze, and “critical” e.g. badger, gripe. I uploaded the respondent responses to the collocation software GraphColl (Brezina et al. 2015), and then verified which of the judged components correlated most in Mutual Information.

As expected the Manner component Effect on the Hearer is constrained by the Speaker’s Intention and the Speaker’s Attitude. The other Manner components behave in various ways that duly reveal a radial network with some of the Manner components being core to “friendly” MoS verbs and others to “critical” MoS verbs. The relation between the sets of verbs fanned out to disclose the more central members of the category and the more peripheral members. These results illustrate how the Manner components serve to diversify MoS lexicon, thus giving the speaker possibility to express subtleties when identifying how people say things.
1.1 The MoS verbs

The MoS verbs taken into consideration in this investigation have been extracted from an original set of 186 verb entries. Previous research distinguished the MoS verbs (176 verbs for 186 verb entries) (Vergaro et al. 2013). Using this same original set of MoS verb entries our research group has investigated: fictive path (Vergaro et al. 2014), semantics-syntax interface measures of Attraction and Reliance between the verbs and the Prep-Sats (Sandford et al. 2016), respondent agreement on Manner components and psychological reality (Sandford 2016), and cross-linguistic Italian-English comparison of MoS verbs in translation (Mastrofini 2013).

To put together the verb data set, we first collected a series of MoS verbs and then worked at identifying the distinguishing Manner components. First, we gathered MoS verbs from lists found in previous research (see note See Zwicky 1971a, 1971b; Mufwene 1978; Snell-Hornby 1983; Lehrer 1988; Faber & Sánchez 1990; Levin 1993; De Mauro 1994; Rojo & Valenzuela 2001; Urban & Ruppenhofer 2001; Ruppenhofer et al. 2010). We then documented the verbs and considered up to three different senses of each. After having added all of the synonyms found in Dictionary.com to the list, we double-checked and expanded it by looking up each verb in Wordreference.com and crosschecked each in Merriam-Webster.com. The verb definitions were considered in the following dictionaries: Oxford English Dictionary, Cobuild Dictionary, Longman Language Activator, New Oxford American English Dictionary. We thus set the inclusion criterion for the verb set as: The definition of the verb has to include Manner either as a physical description of the sound and/or as a semantic-pragmatic specification. This eliminated all those verbs whose definition did not specify Manner, or those that referred only to sound and not to speaking. This process left us with 176 MoS verbs, for a total of 186 verb entries; to deal with the verbs that had multiple senses we used separate numbered entries (e.g. jaw (1), jaw (2)).

Through the analysis ten descriptive Manner components emerged that we divided into two superordinate categories: physical-auditory and semantic-pragmatic. The physical-auditory included: Pitch, Volume, Speed, and Rhythm; and the semantic-pragmatic include: Directionality, Persistence, Formality, Speaker’s Attitude, Speaker’s Intention, and Effect on the Hearer. We then put together a chart that listed the verbs, identified the specific Manner components for each verb entry, and highlighted the characterizing aspects of each verb, for example see Table 1.

The psychological reality of these Manner components has been confirmed through a series of online surveys developed to verify the 10 components distinguished for each of the 186 verb entries (see §2.2 and Sandford 2016). The results from these surveys were extracted for each of the “friendly” and “critical” attitude verbs examined in the present study.

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3 The research group included Carla Vergaro, Roberta Mastrofini, Yhara Formisano, and myself. Marco Bagli also assisted with the analysis of corpus occurrences.

4 I realize that this set cannot be totally exhaustive, others that have not been included in the list have come to our attention in the meantime. Nonetheless, I have stayed with the original data set to be able to maintain comparative results as we study different MoS aspects.
1.2 The structure of the paper

The paper is structured in the following way. After having introduced the aim of the paper and the background of Manner research, §2 discusses categorization, the concept of radial network, and the relation between the verbs selected for the model. I also explain the components of Manner of the MoS verbs that are used to model the correlation between the verbs. §3 discusses GraphColl software and how it is used to construct the model. §4 illustrates the results and shows the quantitative model of the qualitative questionnaire input. §5 gives the conclusions and suggests a predominance of a Negativity bias.

2. Categorization of verb components

Categorization is one of the most fundamental cognitive processes that living beings use to make sense of the world and interaction. It is the act of grouping similar things or actions together to facilitate learning, planning, communication, and cognitive economy. It is known that the cognitive process of categorization allows us to create groupings that may vary according to the circumstance and to the specific associations at hand (Croft and Cruse 2004: 74-105). For this reason, it is considered a dynamic process that is both conventional and creative. In this study, I consider the category as a container of a radial network that in turn forms a series of sub-categories. The aim here is to verify how the specific members of the MoS verb category are organized; what members are central and which are peripheral. I hypothesize that subcategories are attached to components of the basic member according to a metonymic and image schematic relation of general to more specific; there is a sort of category network or chaining that fans out from the center components. This type of relation is formed by a gestalt that allows for an MoS radial category.

Next, I discuss the concept of radial network, gestalt, and the relation between the verbs selected for the model. I then explain the components of Manner of the MoS verbs that are used to model the correlation between the verbs.

2.1 Radial networks

A radial network is a model used to describe the relation between members in a category that presupposes a composite prototype at the center. As Evans describes:

> The members of the radial category are not generated. Rather, they are extended by convention and therefore must be learned. A composite prototype determines the possibilities of the extension, together with the possible relations between the variants and the central prototype (2007: 177).

A radial structure is seen as having a central case where the subcategories are understood as deviations from that case (Lakoff 1990: 83). Lakoff too stresses
that the variation of the central cases is conventionalized and cannot be predicted, but must be learned. He also remarks how radial structures are an extremely common cognitively economic structuring of world knowledge. A central case, or good gestalt, may also be considered a “cognitive reference point” for the members of the category.

Good gestalts are cognitively simple, easy to learn, easy to remember, and easy to use:

\[
\text{if } A \text{ is a good gestalt, and } B \text{ is a minimal variation of } A \text{, then } B \text{ is almost as good a gestalt as } A.
\]

In other words, there is a very good reason why cognitive structure is organized in terms of good gestals and minimal variations on them: it maximizes cognitive efficiency. Thus, we can see why there should be so many radially structured categories. If a cognitive model is a good gestalt, then minimal variations on it will be easy to learn, remember, and use. When there are many minimal variations on a cognitive model, the result is a radially structured category (Lakoff 1990: 538).

By Gestalt I refer to the combination of aspects that allow for the conceptualization of the very structure of the object, property, relation and of its characteristic elements such as: proximity, similarity, smallness, symmetry, good continuity, good closure, and surroundedness. These Gestalt principles define a type of default conceptualization mechanism applied to interpretation. Gestalt theory of mind and brain posits that the operational principles of the brain are holistic, parallel, and analog, and that our interpretation of sensory input follows these self-organizing tendencies. It is the most basic level of constitution of experience (cf. from Gestalt psychologists Koffka 1935, and Wertheimer 1923; see for example Lakoff 1990; Lakoff & Johnson 1999; Johnson 1990, 2008; Talmy 2000).

### 2.2 Manner components and variables

The corpus of 22 verb entries that are taken into consideration here were extracted from our original corpus. The responses that are used for the MoS verb model are from Online surveys conducted through Survey Monkey to verify the psychological reality of these verbs for native English speakers. This study reports the results that have been extracted from nineteen surveys of the entire original data set that was administered to verify the Manner components.

Each of the surveys dealt with ten verbs each; for a total of 114 questions: ten multiple-choice questions — one for each component — per ten verbs; one multiple-choice question regarding the respondent’s knowledge of each verb, and four generic questions (regarding native English speaker status, age, sex, and profession). I randomized the grouping of the verbs for each survey. The order of the queries was important to facilitate the respondent in the arduous task of completing the survey. Hence, the first section presented the generic question pages, the second section consisted in ten separate pages — one per each component type — that were presented randomly. Each component was defined at the top of the window, which was constantly visible to the
respondent while she/he answered the same question for the ten different verbs. The third section regarded the semantic-pragmatic components: Speaker’s Attitude, Speaker’s Intention, and Effect on the Hearer. These pages appeared in a fixed order to make comprehension of the verbs under analysis less complex. The respondent could go back at any time to change an answer during the survey until she/he closed it by hitting the done button at the end. The ten-survey-verbs were also randomized and repeated within each page regarding the single component. Again, this was done to minimize order bias and to facilitate the process of identifying the pertinent component in each verb. A progress bar illustrated the number of required answers and the percentage of answers given as the participant proceeded through the survey.

The responses were collected through survey links sent out through word of mouth, emails, and Facebook. The access settings controlled that respondents could take the survey only once, and that only the completed surveys be included in the final analysis (quite a few respondents stopped part way through the surveys).

The 10 components may be defined as follows. There are four physical-auditory components. 1. *Pitch* is a description of the tone used in speaking. 2. *Volume* is a description of the loudness of voice. 3. *Speed* is a description of the rate of words per minute. 4. *Rhythm* is a description of the patterned recurrence of a beat, accent, or the like; that is, whether the flow of speech has a broken quality to it or not. There are six semantic-pragmatic components. 1. *Directionality* is a description of the course of the words. It distinguishes verbs that are bidirectional by definition; they denote a mutual communicative exchange or not. 2. *Persistence* is a description of the length or constancy of the speech. 3. *Formality* is a quality of the word itself – and not its use – as found in the dictionary definitions. 4. *Speaker’s Attitude* is described by an adjective such as: “friendly” or “critical”. 5. *Speaker’s Intention* is described by verbs such as: “persuade”, “complain”, “gossip”. In the cases in which almost any kind of intention is possible we used the concept of more intention, no intention, or more/less intention. 6. *Effect on the Hearer* is a description of how what is said has a consequence on the person who hears it (for further explanation of the component meaning and how they were indicated in the original data set see Sandford 2016: 84-87, Sandford et al. 2016: 146-149).

### 2.3 “Critical” and “Friendly” Attitude MoS verb and responses

As mentioned above, the corpus of “critical” and “friendly” MoS verbs were selected from the original data set; eleven verbs per attitude. Table 1 shows the set and the hypothesized Manner components. This coincidental balance of number of verbs lent itself for comparison between the two different attitudes: one negative and one positive. The verbs are: “critical”: *badger, bleat, carp (2), decry, gripe, hoot (1), kvetch, moan, mock, mutter, nag;* “friendly”: *chat, chatter, chipper, chitchat, confabulate, gab, jaw (1), natter, rap (1), schmooze, twitter.*
Table 1. “Critical” and “Friendly” verb components from original hypothesis

<table>
<thead>
<tr>
<th>“Critical” verb set</th>
<th>MoS verb</th>
<th>P</th>
<th>V</th>
<th>S</th>
<th>R</th>
<th>D</th>
<th>Per</th>
<th>F</th>
<th>S’s Attitude</th>
<th>S’s Intention</th>
<th>Effect on H</th>
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<tbody>
<tr>
<td>Badger</td>
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<td>→</td>
<td>↑</td>
<td>critical, assertive</td>
<td>persuade</td>
<td>↓</td>
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<td>Bleat</td>
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<td>→</td>
<td>•</td>
<td>critical</td>
<td>complain</td>
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<td>Carp (2)</td>
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<td>→</td>
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<td>critical</td>
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<td>Decry</td>
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<td>→</td>
<td>•</td>
<td>critical</td>
<td>denounce</td>
<td>↓</td>
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<td>Gripe</td>
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<td>→</td>
<td>↑</td>
<td>critical</td>
<td>complain</td>
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<td>Hoot (1)</td>
<td>↑ ↑ • •</td>
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<td>→</td>
<td>•</td>
<td>critical</td>
<td>deride / reprimand</td>
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<td>Kvetch</td>
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<td>→</td>
<td>↑</td>
<td>critical</td>
<td>complain</td>
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<td>Moan</td>
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<td>→</td>
<td>↑</td>
<td>critical</td>
<td>complain</td>
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<tr>
<td>Mock</td>
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<td>→</td>
<td>*</td>
<td>critical</td>
<td>deride</td>
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<tr>
<td>Mutter</td>
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<td></td>
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<td>→</td>
<td>↑</td>
<td>critical / dissatisfied</td>
<td>complain</td>
<td>↓</td>
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<tr>
<td>Nag</td>
<td>• • • •</td>
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<td></td>
<td></td>
<td>→</td>
<td>↑</td>
<td>critical / dissatisfied</td>
<td>persuade / complain</td>
<td>↓</td>
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<tr>
<td>“Friendly” verb set</td>
<td>Chat</td>
<td>• • • •</td>
<td>↔</td>
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<td></td>
<td></td>
<td>→</td>
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<td>friendly</td>
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<td></td>
<td>Chatter</td>
<td>• • ↑ •</td>
<td>↔</td>
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<td>→</td>
<td>•</td>
<td>friendly</td>
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<td></td>
<td>Chipper</td>
<td>• • ↑ •</td>
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<td>→</td>
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<td>friendly</td>
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<td>Chitchat</td>
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<td>→</td>
<td>•</td>
<td>friendly</td>
<td>gossip</td>
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<td></td>
<td>Confabulate</td>
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<td>→</td>
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<td>friendly</td>
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<td>Gab</td>
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<td>→</td>
<td>•</td>
<td>friendly</td>
<td>gossip</td>
<td>↑ / ↓</td>
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<td></td>
<td>Jaw (1)</td>
<td>• • • •</td>
<td>↔</td>
<td>↑</td>
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<td>→</td>
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<td>friendly</td>
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<td>Natter</td>
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<td>→</td>
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<td>friendly</td>
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<td>↑</td>
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<td>Rap (1)</td>
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<td>→</td>
<td>•</td>
<td>friendly</td>
<td>gossip</td>
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<td>Schmooze</td>
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<td></td>
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<td>→</td>
<td>•</td>
<td>friendly</td>
<td>gossip / manipulate</td>
<td>↑</td>
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<td></td>
<td>Twitter</td>
<td>↑ ↓ ↑ •</td>
<td>↔</td>
<td>↑</td>
<td></td>
<td></td>
<td>→</td>
<td>•</td>
<td>friendly / nervous</td>
<td>gossip</td>
<td>↑ / ↓</td>
</tr>
</tbody>
</table>

| Table 1. “Critical” and “Friendly” verb components from original hypothesis |

Legend: The component may be more/high/positive indicated with arrow up (↑), or less/low/negative arrow down (↓), or not applicable dot (•), the direction of the MoS verb is arrow two directions (↔) or arrow one direction (→). Grey background indicates the central defining component(s). (P)itch, (V)olume, (S)peed, (R)hythm, (D)irection, (Per)sistance, (F)ormality, (S’s) speaker’s, (H)earer.

A ten respondent sub-corpus per verb was then selected from the general survey responses considering both age and gender (mean: female 60% age 52;
male 40% age 55) to maintain close similarity between the two groups. Each response was a token in the sub-corpus. This resulted in a total of 1320 tokens per attitude, or 2640 tokens. Of these tokens, there were a total of 52 types possible for the “critical” verbs and 49 types for the “friendly” verbs. By ‘token’ I mean: any single, particular instance of an individual word in a text or corpus; and by ‘type’: a single particular word form — any difference of form (e.g. spelling) makes a word a different type. All tokens comprising the same characters are considered to be examples of the same type (CASS Glossary 2013: 9).

As discussed in Sandford 2016, examination of the first series of surveys revealed a general agreement across respondents of 80-63% with the hypothesized verb component set: that is 80% on the central most “critical” verb components, and 63% accordance if we exclude the ‘n/a’ combinations. Respondents tended to assign a component where hypothetically none was identified in the original definition of the MoS verb.

Moreover, the respondents generally agreed on which components they assigned to each verb;

though there is a wide variation on the specific responses to each verb and component possibility, the respondents identify the same components; the initial results of a general 73% agreement demonstrate that Manner in the Speaking event is psychologically real. Native speakers agree more than disagree on the specific components for the specific verbs (Sandford 2016: 98).

These results serve as a solid foundation for the present model, that reveals the second step in understanding how the Manner components serve to diversify MoS lexicon, thus giving the speaker space to distinguish the numerous aspects of communication.

### 3. Technique to make radial network

To build a sort of radial network of the “friendly” and “critical” verbs I referred specifically to Brezina, McEnery, & Wattam (2015), who introduce GraphColl, a free multi-platform tool for the analysis of collocation networks. The software was developed at the ESRC Centre for Corpus approaches to Social Science, at Lancaster University. It allows you to upload a txt. corpus and to analyze the relation or “collocations” between the tokens and types.

In this case, I did not use a classical corpus of texts, but I used the verb sets and the respondent files for each verb. This meant that I uploaded ten files per verb — one for each respondent — listing the 10 components according to the survey responses, I also included the response to the familiarity with the verb, and the verb being analyzed. This means that each file had 12 responses. Each

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5 The occupations were divided as follows: Student 21%; Education, Training, and Library Occupations 25%; Life, Physical, and Social Science Occupations 2%; Community and Social Service Occupations 1%; Legal Occupations 1%; Architecture and Engineering Occupations 0; Arts, Design, Entertainment, Sports, and Media Occupations 18%; Healthcare Support Occupations 2%; Administrative Occupations 13%; Other 17%. 
response was coded as one word to be able to differentiate tokens and types, e.g. (↑) Persistent is mpersistent, (↑/↓) Effect is p/neffect, or (→) direction is odirection. As mentioned, these files became the corpus used by GraphColl.

3.1 Variables for corpus files

Each component tested had a set of variables consisting in the multiple-choice answers for each question. Speaker’s Attitude and Speaker’s Intention had 3 choices; Effect on the Hearer had 4 choices. The other components, Directionality, Formality, Persistence, Volume, Speed, and Rhythm, all had 3 choices; Pitch had 5 choices. Plus, the last question about the respondent’s familiarity with the verb, with 3 choices. This means that there was a minimum of 35 total possible verb Manner variables per verb. The variables consisted in the following:

*Pitch*: high, low, level, nasal, n.a.
*Volume*: high, low, n.a.
*Speed*: high, low, n.a.
*Rhythm*: more, less, n.a

*Attitude*: (very critical/friendly, critical/friendly, not critical/friendly)
*Intention*: more, less, more or less; or specific (e.g. to persuade strongly, to persuade, not to persuade)
*Effect on Hearer*: positive, negative, positive or negative
*Direction*: one direction, two directions, one or two directions
*Persistent*: more, less, non-applicable (n.a.)
*Formal*: more, less, n.a.

*Know the verb*: yes, kind of but I’d never use it, no

In final analysis, the total variables possible for the set of “critical” verbs was 55 (44 + 11 verb types) and for the set of “friendly” verbs was 49 (38 + the 11 verb types)\(^6\). Whereas, the variables that the respondents selected as part of the verb definition were fewer: 52 for “critical” and 47 for “friendly”.

To be able to construct the model of MoS variable collocations two parameters were set. One to read the collocation of the variables and establish the distance, i.e., the span, set at 0L to 12R to include all of the components in the respondent list. The next parameter is the desired statistic measurement, in this case I applied — Mutual information (MI) MI=3 to establish exclusivity. MI is the measure of collocational strength.

The higher the MI score, the stronger the link between two items. MI score of 3.0 or higher is to be taken as evidence that two items are collocates. The

\(^6\) The difference in variables per set is because the “critical” verb set had four different possible intentions: persuade, complain, deride, denounce; each with the three different degrees: very, yes, and no — so twelve variables for intention. The “friendly” verb set had only 2 possible intentions: generic intention or gossip; each with the three different degrees — so six variables.
closer to 0 the MI score gets, the more likely it is that the two items co-occur by chance. A negative MI score indicates that the two items tend to shun each other.

Mutual information is one of many quantities that measures how much one random variable tells us about another. It is a dimensionless quantity with (generally) units of bits, and can be thought of as the reduction in uncertainty about one random variable given knowledge of another. High mutual information indicates a large reduction in uncertainty; low mutual information indicates a small reduction; and zero mutual information between two random variables means the variables are independent (Latham & Roudi 2009: 1658).

Here the graphs show only above MI 3 score. The software allows us to highlight the single types and view the single MI scores for each collocate.

4. Results and network model

The type-token ratio as another measure of vocabulary diversity in a corpus, which is equal to the total number of types divided by the total number of tokens. The closer the ratio is to 1 (or 100%), the more varied the vocabulary is (CASS 2014: 9). The selected variable types in relation to tokens thus show: “critical” variables: 52/1320 = 3.94%, and “friendly” variables: 47/1320 = 3.56%. In this case the variable types in relation to the tokens reveal that “critical” verb Manner components are more variable according to the respondents (and in our hypothesis) than “friendly” verb Manner components.

4.1 GraphColl diagram results

In reporting the results of the network model, I first show the visualization of the combination of both verb groups and then each single group according to the MI score. The red dots indicate the verbs that were digitized into the software search window, and the purple dots show the Manner components that collocate with each verb.

Figure 1 of the combined verb sets, illustrates how they group separately to the left and right, with the principle components friendly, gossip, positive effect, two directional, on the left, and the critical, complain, denounce, deride, persuade, negative effect, one directional on the right, thus drawing the verbs in those opposite directions. It is pertinent to note that more rhythm, less formal, yes (familiar), more persistent listed across the top are shared components by both verb groups as are no pitch, no speed, no volume, low volume across the bottom. Though high speed, lower-left, is shared by both types of verbs, it tends towards the “friendly” verbs; where high volume,

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7 Furthermore, the Collocation Parameter Notation (CPN) for Figures 1, 2 and 3 is: 04-MI1(3), Lo-R12, C5-NC1; verbs added. Figure 4 is an example instead of frequency with CPN 01-Freq(5), Lo-R12, C5-NC; verbs added.
upper-right, is also shared by both groups, but it tends toward “critical” verbs. Other components are floating across the center, some closer to “friendly” (no persistent, less persistent, more/less intention, and kind of) and others closer to “critical” (more formal, less speed, and high pitch).

**Figure 1.** “Critical” and “Friendly” verb components; Span 0<>12, Types 58/73, Tokens 2640; Stat MI3.

Figure 2 illustrates the “critical” verb components with MI collocation separately. Again, most of the main components stretch out in line, this time across the bottom, with the verbs fanned out in the middle, and the more specific components across the top (with the exception of the generic negative effect which is also at the top). It seems that the other components shared by fewer verbs appear in a vertical line up the middle. It is possible to pull the dots into convenient order or placing for viewing, but I left the patterns that sorted out according to the statistics without manipulating them.

This freeze image of the “critical” verbs has mock, moan, and badger grouping to one side — even though mutter, badger and hoot share more rhythm, hoot is in the center and mutter towards the other side. This is because mutter and gripe (with moan) share low volume; badger, hoot, and bleat share high volume and line up, but so does decry. It is pushed to the outside though, being more formal and having a specific intention — to very denounce. Badger, bleat, and decry also share high speed; moan and mutter share low volume, low speed, and low pitch — the main difference between the two verbs being more and less rhythm.

As one would expect according to definition, nag and gripe are the more persistent complaining verbs, with kvetch, and are grouped to one side. More persistent is a statistically significant collocate component for eight of the eleven “critical” verbs. It appears that nag and then gripe are the two more basic “critical” verbs; they are differentiated with gripe being low volume and less rhythm and nag being no volume and no rhythm; kvetch, like gripe, is used to complain, but it is characterized by no pitch, no volume, and no speed. Nag is defined by fewer specific active components, and is used to persuade. Last of all are the two close together high volume and high pitch verbs: bleat and hoot; they differentiate in rhythm, less for bleat and more for hoot. Decry and mock are the two more formal verbs.
Figure 2. "Critical" verb components; Span 0<>12, Types 38/52, Tokens 1320; Stat M13.

Figure 3 shows the "friendly" verbs with MI collocation components separately. Again, most of the main components stretch out below left and above right with the verbs fanned out in the middle. The more specific components tend to be above the verb group. This diagram is a freeze image without manipulation. The main components with 10 to 8 verbs per component are in the left corner: friendly attitude, positive effect, two direction, yes (familiar), more rhythm, and less formal. Rap, twitter, gab, and chitchat are the first group from the left, collecting around the intention to gossip. Twitter, chatter, chipper, natter, and are all high speed, as the phono tactics of the verbs would suggest, along with gab and chitchat, but they are slightly spread, since chitchat is less persistent, whereas rap, gab, and chatter are very friendly. Gab is the only positive/negative effect, and chatter is the only high volume. Chipper is also the only "friendly" verb that is one directional. Schmooze is in the middle near chitchat, both being low volume and no pitch — chat, jaw, natter, and confabulate are also characterized by no pitch (6 "friendly" verbs). Natter, chatter, twitter, with gab, jaw, confabulate, and schmooze are also more persistent. Confabulate, jaw, and chat are at the bottom with no speed and no volume also in common. The most basic "friendly" verb appears to be chat, which similarly to "critical"
nag is distinguished by no pitch, no speed, no volume. However, chat like chitchat is also defined by low volume (though chitchat is also high speed). Jaw is the most similar to chat, but is defined also by more persistent, while chat is more rhythm and generically more/less intention. In the “friendly” group, like the “critical” group, there is a formal verb with a Latin root — confabulate. Interestingly in each group there is also a very specific MoS verb with a Yiddish root: i.e. “friendly” schmooze and “critical” kvetch.

Figure 3. “Friendly” verb components; Span o<>12, Types 37/47, Tokens 1320; Stat MI3.

4.2 MI results

Both the “critical” verbs and the “friendly” verb central components had statistically significant MI scores, yet the scores are not as high as the finer distinguishing components since they are more frequent. “Critical” MI had mean value of 3.70 — very critical, yes critical, negative effect, one direction, and yes (familiar) — and “friendly” MI had mean value of 3.76— very friendly, yes friendly, positive effect, two direction, and yes (familiar). More specifically, according to the MI scores, the following has been verified. “critical” verbs are one directional and have a negative effect on the hearer and “friendly” verbs are generically two directional, have a positive effect on the hearer. While verbs with “critical” attitude collocated more often with specific intentions, high pitch, high or no volume, low speed, or low rhythm, and are more formal; verbs with “friendly” attitude collocated more often with both the intention to gossip and generic intention; no pitch; high or no speed; more rhythm and more persistence.
“Critical” verb  4 highest MI score components: excluding common “critical” attitude, neg effect, one direction, yes

<table>
<thead>
<tr>
<th>verb</th>
<th>component 1</th>
<th>component 2</th>
<th>component 3</th>
<th>component 4</th>
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<tr>
<td>badger</td>
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<td>h speed 4.54</td>
<td>m persistent 4.34</td>
<td>m rhythm 4.28</td>
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<tr>
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<td>l rhythm 4.55</td>
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<td>n speed 4.20</td>
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<td>h pitch 4.34</td>
</tr>
<tr>
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<td>l volume 4.54</td>
<td>l rhythm 4.14</td>
<td>l formal 3.64</td>
</tr>
<tr>
<td>hoot</td>
<td>h volume 4.97</td>
<td>h pitch 4.76</td>
<td>m rhythm 4.28</td>
<td>l formal 4.16</td>
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<tr>
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<td>n pitch 4.81</td>
<td>n volume 4.54</td>
<td>n speed 4.20</td>
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<tr>
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<td>m rhythm 4.76</td>
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<td>n volume 4.54</td>
<td>n rhythm 4.41</td>
<td>m persistent 4.34</td>
</tr>
</tbody>
</table>

Table 2. “Critical” verb components with high MI Score
*carp: the respondents only “kind of” knew it. Legend: m = more, l = less or low, h = high, n = no [n/a], y = yes, v = very.

“Friendly” verb  4 highest MI score components: excluding common “friendly” attitude, positive effect, two direction, yes

<table>
<thead>
<tr>
<th>verb</th>
<th>component 1</th>
<th>component 2</th>
<th>component 3</th>
<th>component 4</th>
</tr>
</thead>
<tbody>
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<td>l volume 4.04</td>
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<td>m/l intention 4.77</td>
<td>h speed 4.43</td>
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<tr>
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<td>l volume 4.31</td>
<td>n pitch 3.99</td>
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<tr>
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<td>m intention 5.24</td>
<td>n speed 4.96</td>
<td>n volume 4.40</td>
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<tr>
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<td>m persistent 4.15</td>
<td>l formal 3.97</td>
<td>h speed 3.75</td>
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<tr>
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<td>n pitch 4.19</td>
<td>n volume 3.99</td>
<td>m persistent 3.56</td>
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<tr>
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<td>m/l intention 4.77</td>
<td>m persistent 4.30</td>
<td>h speed 4.24</td>
<td>l volume 4.04</td>
</tr>
<tr>
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<td>y gossip 4.90</td>
<td>l persistent 4.84</td>
<td>l formal 3.97</td>
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<td>m persistent 3.56</td>
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<td>h pitch 5.40</td>
<td>y gossip 4.90</td>
<td>h speed 4.43</td>
<td>m rhythm 4.04</td>
</tr>
</tbody>
</table>


Table 3. “Friendly” verb components with high MI Score

*chipper: the respondents identified it as being “o direction” and only “kind of” knew it. **gab was identified as being “p/n effect”. Legend: m = more; l = less or low; h = high; n = no [n/a], y = yes; v = very.

The outlier verbs were: carp for “critical” and chipper for “friendly” that were only kind of used or understood; chipper was also deemed as the only one directional “friendly” verb; and another “friendly” verb, gab, had positive/negative effect on the hearer. Table 2 and 3 list the first four distinguishing components for each group, excluding the common components, e.g. attitude “critical” or “friendly”, negative or positive effect, one or two direction, and yes (familiar). The MI scores highlight the strongest component for each verb that makes its meaning distinguishable from the others.

Though space does not allow for a detailed account, it was interesting to see how applying the statistic of frequency to the corpus changed the shape of the diagrams showing the verbs forming almost a circle around the more frequent collocate components, with a shape that recalled more strictly a radial type network, see Figure 4. Nonetheless, whatever the shape, the network relations become clearly visible using the collocation software to analyze the respondent responses to multiple choice survey questions.

5. Conclusions

A robust majority of the 186 MoS verb entries (almost 86%) have a negative effect on the hearer (Vergaro et al. 2014). This would seem to be in keeping with our need to pay close attention to possible negative outcomes, or what is known as the negativity bias (Jing-Schmidt 2007, Orians 2014, Sandford 2017). This paper confirms that Effect on the Hearer is one of the basic semantic-pragmatic components of the verb that collocates with the physical-auditory components, or lack thereof, and must interface with the Speaker’s Intention and the Speaker’s Attitude. This model of survey results shows which specific Manner components each verb has, thus allowing us to confirm both through the statistic measure MI, and through the visualization of GraphColl, exactly how the MoS verbs with a “critical” and “friendly” attitude group into a network of senses and distinguishing components.

In keeping with the initial hypothesis Attitude meshes with Intention, Directionality, and Effect on the Hearer — semantic-pragmatic components — to distinguish the central Manner components. Furthermore, the more specific physical-auditory components then collocate with them to establish a network of Manner component differentiation. It appears that the fewer marked Manner components the more basic the network member. The most basic “friendly” verb chat and the most basic “critical” nag are distinguished by less formality, no pitch, no speed, no volume (excluding the constants Speaker’s Attitude, Speaker’s Intention, Effect on the Hearer, and Direction); which leaves the components of persistence (characteristic of nag) and rhythm (characteristic of chat) as core discriminating components. The possible combinations of the variables as modelled here with GraphColl reveal the subtleties in meaning of the verb group members. This fits with the
assumption that the number of specifications conflated in the verb root make it a more generic or a more peculiar MoS verb (Sandford 2016:99).

Figure 4. “Friendly” verb components; Span 0<>12, Types 37/47, Tokens 1320; Stat Freq >5.

The detailed MoS components acquired via online surveys rely on native speaker’s linguistic introspection. Seen as a central methodology in the development of cognitive linguistics, Talmy defines linguistic introspection as:

conscious attention directed by a language user to particular aspects of language as manifest in her own cognition. More specifically, certain aspects of language spontaneously or through evocation can appear in a language user’s consciousness — what can here be termed ‘first-level consciousness’. In the same language user, a second level of consciousness can also occur and has as its object the contents of the first level of consciousness. This second-level consciousness — or attention — can be volitionally evoked and directed at a chosen linguistic target. […] The
accessibility of an aspect of language to directed conscious attention depends at least on the following five factors: cognitive organization in general, particulars of an individual's cognition, the current situation, conditions of attending, and the categorial object of attention”. [...] As a second factor, though, due to individual differences in cognition — whether these result from innate differences or from training or practice — particular aspects of language can be above or below average in their accessibility to consciousness in a language user, thus able to diverge within limits from their usual ranking (Talmy 2007a: XII).

This network of MoS verbs and the Manner components are a direct result of speaker linguistic introspection at second-level consciousness. The request for such detailed introspection on specific word meaning actually made it quite difficult to find respondents who would complete the survey questions, note the high mean age of the respondents. Nonetheless, the data acquired has allowed me to develop a narrow corpus of files that I could then upload to the collocation software, and in a novel procedure model the relations between the verbs and the components. These three network models, the combined “critical” and “friendly” and the two single attitude models, visually elaborate the relation between the Manner components that are part of the MoS verb root, and reveal the centrality or specificity of the single verbs. Moreover, they represent the complexity of the network elements where no two verbs have the same components, informing us of Manner component distribution.

It is my belief that this type of tool and methodology lends itself for investigation of dynamic semantic networks both in research and in pedagogy, creating interest in language as a complex network of categories and revealing how word senses are related.

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