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Attitude and Involvement in Language Processing

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by

Natalia L. Blackwell

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Table of Contents

List of Tables and Figures

Abstract

Natalia L. Blackwell

Attitude and Involvement in Language Processing

The Context Model of language processing describes the effect of context on the interpretation of linguistic input. This series of experiments builds on that model, shedding light on how social context, specifically attitude, affects language processing. Listener attitude affected attention to content (Experiment 1), but this effect itself depended on how attitude was induced (Experiment 2), and was found to affect the way the story was recalled, in both a verbal and written format (Experiment 3). In Experiment 1, the more a listener liked a speaker, the more they attended to the content of the speaker's narrative. In Experiment 2, the more similar or more different to the speaker a listener believed themselves to be, the more they attended to what was said. In Experiment 3, the more a listener liked a speaker, the more affective words they used. Overall, it was found that attitude affected language processing in terms of attention, comprehension, and reproduction.

Keywords: Attitudes, Comprehension, Production, Attention, Memory

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Context and Language Processing

Context affects linguistic processing from the very beginning (Altmann &

Steedman, 1988; Marslen-Wilson & Tyler, 1987; Spivey-Knowlton,

Trueswell, & Tanenhaus, 1993), and this influence is captured in models of

language comprehension, such as the Interactive Model (McClelland &

Elman, 1986). Higher levels modify lower levels in a 'top-down' process,

where contextual knowledge exerts an effect on more basic levels such as

phonetic perception and syntax. The overarching idea of these models is that

limitations in memory, attention, and processing capacity are overcome by the

constraint of other relevant, but peripheral, information. Social cognition is an

example of a higher-level factor, and serves to filter input and speed up

response. Such top-down effects are influenced by attitudes and motivational

states of the perceiver, and subsequently affect other processes, such as

attention (Bruner, 1957).

While the general influence of social context information has been

taken account in the models of language comprehension, the specific details of

the way social information is incorporated into language comprehension is

still unknown. According to traditional modular accounts, the interpretation of

information that is conveyed in a social situation occurs in two, or possibly

more, stages. One of the stages is automatic and uses low-level concepts and

information that is readily available. The other is driven by an executive

system that performs higher-order, goal directed, cognitive activities (Bargh, 1984; Wyer & Srull, 1989). In such models, the executive system kicks in only after the lower level incoming linguistic information has been processed. Recent research, however, suggests that the social comprehension may not exert its influence at separate stages. Instead, interactive models of language comprehension put forward the idea that pragmatic information immediately limits the way the information is interpreted (e.g., MacDonald, 1994; Tanenhaus & Trueswell, 1995). The pragmatic aspects of the interaction, such as the speaker's characteristics, provide constraints that are integrated by the listener simultaneously with other lexical, structural, and discourse-based factors.

These effects of social cognition have been found to affect language processing at a variety of levels. Listeners not only take in the propositional content of the information conveyed by a person speaking, they also attend to social information, such as the speaker's ethnicity, age, and gender. At the phonetic level, for example, interpretations of *t*/*d* ambiguity were different when listeners believed they were hearing an African American than a Caucasian speaker (Staum Casasanto, 2008). At the prosodic level, listeners understood uptalk and elongations differently depending on what they believed about the speaker's knowledge states (Tomlinson & Fox Tree, 2011). In this study, when told they were hearing a discussion about

politicians by a speaker majoring in political science, listeners were slower in processing language after an elongated utterance with a rising pitch than those who believed the speaker to be a non-expert. Beliefs about a speaker also influence how disfluencies are interpreted. Listeners in a study investigating reference comprehension used social information to interpret *ums* and elongations differently if they believed the speaker was suffering from object agnosia or not (Arnold, Hudson Cam, & Tanenhaus, 2007). At a semantic level, there is a slower processing and response when information conflicts with the given the social context. In a study where participants heard the sentence "Every evening I drink some wine before I go to sleep", produced by what sounded like a young child, the socially-incongruent processing resulted in correspondingly larger ERP effects, suggesting greater effort in semantic processing (Van den Brink et al., 2012).

A language processing model that attempts to show how context affects comprehension is the Context Model (van Dijk, 2009). In this model, context is assumed in have an indirect influence on language processing, and it is the subjective interpretation of the context that constrains the production and comprehension of language. The model also describes which aspects of the context are used at any time. There is an overwhelming amount of social information available to the listener, so it is necessary to be selective in what is attended to, remembered, or inferred in any situation. Thus, an important aspect of this model is that only relevant properties of the context are used. Internal cognitive structures called schemata, frames, or scripts (Minsky, 1975; Rumelhart, 1980; Schank and Abelson, 1978) are used to organize and simplify knowledge about the world, about the self, and about others. They are dynamically constructed by the listener, and serve to filter out irrelevant information. According to this model, then, the relevant contextual information that serves to limit processing is based on the listener's own subjective world-view. Listeners will interpret information about a speaker according to their own mental structures, and attitude may serve as a filter that affects the listener's uptake and processing of the information given by that speaker.

Although the Context Model takes into account the impact of context on attention and comprehension, it does not specify in any detail the process by which this occurs. There is no explanation of how attention is influenced, for example, whether it is a global inattention, or a specific inattention to particular classes of words. There is also no elucidation of how context influences later stages of the process, such as retrieval. This study attempts to fill in the gaps, showing how attitude specifically affects attention, comprehension, and recall.

Attitude and Social Evaluation

Attitudes are the application of an attribute, such as *likable* or *knowledgeable*, to the evaluation of something, such as a person or object (Ajzen & Fishbein, 2000; Eagly & Chaiken, 1993, Petty et al., 1997). Likability, in turn, can be defined as a pleasant and enjoyable experience (Ahearne, Gruen, and Jarvis 1999), or as the ability to induce positive emotions in others (Sanders, 2006). Two important factors that influence likability are similarity and familiarity (Moreland, & Zajonc, 1980; Kenrick, Neuberg, and Cialdini, 2002). Similarity produces this effect by mirroring a person's own beliefs, interests, and experiences, and thereby positively influencing attitude through validation. Familiarity increases likability by providing grounding, with interlocutors sharing a mutual awareness of the other's experiences and knowledge about the subject being discussed (Clark & Brennan, 1991). This allows for an efficient coordination of information, with the benefit of eliminating the need for excess detail and lengthy explanations. This common ground gives insight into the

other's expectations and allows interlocutors to more successfully meet those expectations. Strangers, on the other hand, have less grounding, and their interaction may suffer.

Models of attribute generation hold that the formation of beliefs about the object triggers a spontaneous and automatic evaluation of it (Ajzen & Fishbein, 2000). According to the model of impression formation (Srull & Wyer, 1989), attributing particular personality traits to a stranger triggers an evaluation of that person, and an attitude is formed. Given a number of evaluative characteristics, it has been found that likability emerges as a central, coherent evaluative dimension (Srull & Wyer, 1989). This attitude is then used to categorize the target's behaviors, and serves as a basis for subsequent evaluations, so is typically resistant to modification based on later information. Once the evaluation is formed, it is stored in long-term memory, and ready to be retrieved at a relevant cue (Petty & Cacioppo, 1987). There is a functional usefulness in maintaining a set evaluation of an object or class of objects, as it allows an accordant rapid response when in contact with other, similar strangers (Katz, 1960). Therefore, some attitudes are quite stable and resistant to change, regardless of the value and relevance of newer information (Brown, 1970).

Although strangers have less reliable knowledge about each other, past experience can provide information that improves communication. When facing a relatively unknown speaker, social schemas built on general social knowledge allow

for the generation of expectancies about how the person will behave, filling in whatever information is missing (e.g., Fiske & Neuberg, 1992; Fiske & Taylor, 1992; Olson, Roese, & Zanna, 1996). Being able to predict what a person will say and do, based on what is known about them, or what the listener *thinks* is known about them, can speed up the processes of interpretation. Thus, attitudes that are formed even when the speaker and listener are strangers, and do not share much common ground, may still serve to influence language processing.

Research investigating the influence of the relationship between listener and speaker have typically focused on the way that this social context influences the speaker. Audience design refers to the way speakers alter their speech depending on their addressee, with influencing factors such as the knowledge and characteristics of the addressee that are assumed to be part of common ground (Metzing & Brennan, 2003; Clark, 1996; Clark & Marshall, 1981; Isaacs & Clark; Nadig & Sedivy, 2002). For example, participants in an interactive communication game spent more time interacting with an addressee when they believed they were speaking to a child than when speaking to an adult addressee (Newman-Norlund, Noordzij, Newman-Norlund, Volman, Ruiter, Hagoort, & Toni, 2009). Research focusing on interlocutor relationships and speech have revealed some differences in the language produced. A study examining speaker-listener solidarity and speaking style found an effect of speaker familiarity on number of words per pause (Markel, 1990). Friends were more likely to employ many words per pause, and strangers few. It has also been found that

the relationship between interlocutors also affects overlaps in speech, with married speakers typically producing speech that contained more overlaps than between two strangers (Bortfeld, Leon, Bloom, Schober, Brennan, 2001).

However, there is little research on the influence of the social relationship from the perspective of the listener. Studies in persuasion, for example, have shown the effect of endorser attractiveness on opinion change, where participants viewing attractive celebrities were more likely to purchasing the item endorsed than those viewing an unattractive celebrity (Kahle & Homer, 1985). Although such studies have shown the effect of attitude on message uptake, shedding light on language processing on a global level, no existing studies have investigated the specific effect of attitude on a listener's language comprehension.

Attitude and Attention

Attitudes are traditionally viewed as being generally relatively stable and enduring. However, given the limitations in cognitive capacity, it is not practical to have an infinite number of stored attitudes toward an infinite number of objects (Schwarz & Bohner, 2000; Zanna, 1990), and more recent research has put the traditional rigid view into question. It has been found that not all evaluations are stable, and depend on factors such as current thoughts, situations, and the accessibility of the attitude. For example, participants probed on their views of the two politicians' performances in the Reagan versus Mondale race in the 1984

presidential elections were found to show a positive correlation between attitude accessibility, attitude strength, and attitude congruence. The more a listener liked one of the two candidates, the faster they were at providing an evaluation of the candidate's performance, and the better they believed the candidate performed (Fazio & Williams, 1986).

Although the rapid generation of evaluations and attitudes is often necessary, the resulting judgment, and subsequent reaction, may not be felicitous. The multi-component view of attitude formation holds that evaluations are an integration of cognition and affect experienced in relation to the person or object (Eagly & Chaiken, 1993; van der Pligt. 1996). Thus, the extent to which cognition or affect influences an evaluation depends on the situation. According to the heuristic model of persuasion (Eagly & Chaiken, 1984), in some cases, not much cognitive effort is exerted in judging the validity of a message. Instead, listeners may agree with the message based on superficial cues, such as speaker likability. The driving mechanism behind this message evaluation may be based on a basic rule, such as *people agree with people they like* (Chaiken, 1997). Evaluation based more heavily on affect than cognition may lead to inappropriately biased judgements. For instance, when presented with character descriptions, participants who disliked a character were more likely to predict future immoral behavior, despite the lack of relevance of certain trait descriptions to the predicted behavior (Lupfer, Weeks, & Dupuis, 2000).

The reliance on such a heuristic may also have a negative effect on linguistic processing. For example, though listeners may agree with the message of a liked speaker, their attitude may interfere with attention to specific words. This may cause an inverse relationship between likability and memory for message specifics. One factor that may be critical to anticipating differences in speaker characteristics changes is attention. Research suggests that when attention is directed away from speech, the ability to detect information is reduced. For example, word recognition accuracy is reduced when attention was directed away from the speech stream (Sinnett, Costa & Soto-Faraco, 2006). Furthermore, differences in *what* is attended to can affect what is heard. In any given social context, listeners need some way to determine which situational elements are more worthy of attention than others. The complexity of a situation typically exceeds attentional capacity, so it is necessary to focus on information that may be the most valuable to the listener. Information that might confirm or disconfirm an existing schema or expectancy may be the most important (Bower, Black, & Turner, 1979), and so it may be most advantageous to focus on those individuals about whom existing information is known. This attentional bias is supported by a study investigating the effect of prior expectations, where participants allocated more attention to an actor about whom they had expectancies than to those about which they had no information (Enquist, Newtson, and LaCrosse, 1979). When presented with a character description in terms of traits, then, listeners should form a cognitive model of the speaker. This in turn should affect

what is attended to, which items are recalled better than others, and how the overall message is comprehended. However, given existing research, it is difficult to predict in which direction the effect will fall. It can be worse, as discussed earlier in this section, or possibly better if listeners respond to the speaker in the same way as those in the study of known/unknown actors discussed above.

When listening to speech, there is a trade-off between attending to function or to form. It has been shown that people can either pay attention to content, or pay attention to style, but not simultaneously to both (Christenfeld, 1995). While participants in this study were explicitly told to either focus on content or to form, it may be possible to implicitly manipulate the scope of attention. For example, it has been found that positive affect increases the breadth of attentional selection, widening semantic access in a semantic search task, whereas negative affects narrows it (Rowe, Hirsh, & Anderson, 2007). This widening has been shown to support the processing of global perceptual information, with interpretation and recall based on heuristics (Gasper & Clore, 2002), while the narrowing effect facilitates analytical and systematic processing (Pham, 2007). Mood has also been found to affect overall processing, where those participants induced to feel happy were less deliberate in their judgment and decision making than those who were sad (Bless & Igou, 2005; Bodenhausen, Mussweiler, Gabriel, & Moreno, 2001).

These studies, then, open up the question as to the effect of evaluations and attitude on language processing. Given a description of positive or negative

characteristics, it is possible that listeners will be affected by their attitude, and only attend to certain aspects of the speech, and thus have varying degrees to which they remember details of the story. The first hypothesis tested follows:

Hypothesis 1: The attitude of a listener toward a speaker will affect attention to the speaker's message. When presented with a likable speaker, listeners will pay more attention than those presented with an unlikable speaker.

Individual Differences

Although it is expected that there will be overall significant differences between those who are primed with a positive character description versus those with a negative description, as the Context Model predicts, listeners will have their own interpretation of the information. While evaluations are spontaneous and automatic, individual differences in forming evaluative responses exist, and a 16-item scale has been developed to measure this variability. Those who scored higher on the evaluation scale were found to be more likely to hold attitudes towards social and political issues, and to have more evaluative thoughts about a typical day (Jarvis & Petty, 1996). In addition, when evaluations *are* formed, there are individual differences in the tendency to base them on cognition or affect (Haddock & Zanna, 2000). Listeners have been found to differ in their tendency to rely on thoughts or feelings, with the attitudes of individuals identified as *thinkers* strongly depended on

their beliefs about the attitude objects, not by their feelings, and the reverse for individuals identified as *feelers*.

Existing studies have shown that there are in fact individual differences in what degree such social information is incorporated into the linguistic processing. An ERP study, for example, has shown that listeners who are more empathetic reacted more to information that conflicted with stereotypical expectations than those who were were less empathetic (van den Brink, Van Berkum, Bastiaansen, Tesink, Kos, Buitelaar, and Hagoort, 2010). This was taken to indicate that those who were better at empathizing were also better at integrating information about the speaker with the message being produced. Thus the primes may not have the same effect for all participants, and subsequent comprehension may not be affected to the same degree. The second hypothesis follows:

Hypothesis 2: There will be individual differences to how much the social information will affect a listener's attitude, and this will in turn affect the degree to which attitude affects comprehension. The more a listener likes a speaker, regardless of whether the speaker is presented positively or negatively, the more the listener will attend to the speaker's words.

Involvement and Language Processing

The development of an attitude can arise from information derived from a variety of sources, such as from personal experience with the person or object, or from information given by others. Although intuitively, direct experience should have a stronger influence on the overall evaluation of an object than indirect information, the order in which information about the object is received is important. For example, in a marketing study, participants rated a product much more positively or negatively after first reading a strongly positive or negative review then experiencing a neutral interaction with it, than if they experienced an neural interaction with the product first, and then read a positive or negative review about it (Reed, Wooten, & Bolton, 2002). The amount of exposure to external information also matters. In a study looking at the effect of attitude accessibility and repeated exposure to information about an advertisement, reading a description four times had a stronger influence on attitude and evaluations about the advertisement than direct exposure to it (Berger, & Mitchell, 1989).

Similarly, heuristics such as readily agreeing with a likable person can evolve from previous experience with others, or from a rule based on a habitual association between the concepts of liking and interpersonal similarity (Stotland & Canon, 1972). Thus, evaluative processing can also be triggered through listener comparison of self to the speaker, without directly experiencing any positive or negative speaker behaviours. How individuals define themselves influences how they think, feel, and

interact with others, and his type of comparison of interpersonal similarity can have have consequences for the listener. For example, in an early study investigating language comprehension of speakers from three levels of social status, lower, middle, and upper class, listeners' comprehension was highest when the listeners held the same status as the speaker (Harms, 1961).

Involvement, in contrast to detachment, refers to the relationship of speaker with the hearer, and the relationship of the listener with the subject matter (Chafe, 1985, p. 116). Involvement can be manipulated, and this change can effect the depth of message processing, and consequently, the message's influence by affecting the depth of message processing, (e.g. Andrews & Shimp, 1990). As was previously discussed, feelings of similarity significantly influence liking, and the comparison of self to another may increase involvement with the subject matter. This feeling of similarity is not restricted to interlocutors who are familiar with each other. When strangers are engaged in an cooperative task, assumed similarity can also lead to an improved performance (Krivonos, Byrne, & Friedrich, 1976; Orbell & Dawes). Thus, if listeners are asked to compare themselves to the speaker, and to think about their similarities, comprehension of the speech may be affected. And this comparison may be based on a variety of factors which may have different effects on involvement. According to the multidimensional approach to person impression formation, an analysis of 60 personality traits, such as *cold*, *persistent*, or *sentimental*, can be broken down into two positive and negative dimensions: social desirability, and

intellectual desirability (Rosenberg, Nelson, & Vivekananthan, 1968). The second hypothesis follows:

Hypothesis 3: When asked to compare themselves to the speaker in term of social and   intellectual capabilities, listeners will generate automatic evaluations of the speaker, and that the   processes involved in this generation will affect language comprehension.

Although research in the last decade has shown that individuals tend to organize social judgements largely along the dimensions of competence and sociability (e.g., Judd, James-Hawkins, Yzerbyt, & Kashima, 2005), recent evidence indicates that a fundamental dimension on which groups are evaluated is morality (Leach, Ellemers, & Barreto, 2007). In accordance with in-group and out-group research, priming participants to generate evaluations based on morality may have an even stronger effect on involvement (Aquino & Reed, 2002). Part of this increase may be due to the higher levels of emotion associated with moral reasoning. For example, when evaluating moral sentences such as 'You should break the law when necessary' and factual sentences such as 'stones are made of water', the factual judgments were found to have different cognitive effects. For such judgments, areas of the brain associated with emotional response were active, whereas for factual judgements, no such activity was found (Moll, de Oliveira-Souza, & Eslinger, 2003).

It is also possible there there is an interaction effect between moral comparison and the feelings of the speaker being different. Typically, negative information has a stronger affect on cognitive processing than positive (Baumeister, Bratslavsky, Finkenawer, & Vohs, 2001), and in particular, it has been found that more attention is focused on negative moral information (Pratto & John, 1991), and is a stronger influence on impression formation than positive moral information (e.g. Reeder & Coovert, 1986; Ybarra, 2002).

The third hypothesis follows:

Hypothesis 4: A comparison in terms of morality will increase the emotional response by the listener, leading to greater engagement and deeper processing for both liked and disliked speakers, as compared to a simple character description.

Thus, asking listeners to compare themselves in terms of social/intellectual abilities and morality may lead to greater cognitive processing of the message, which may result in differences in attention and memory, compared to when given basic descriptions of the speaker.

Likability and Story Retelling

The effect of liking on language processing may exert its influence on immediate processing of language. Attitude toward a speaker may also influence later stages of processing, such as the way the message is recalled. Recall is not just just

the verbatim replication of a a linguistic input. Rather, it is an interpretative process, and it is a reconstruction from a specific viewpoint, a speaker's particular schema. This schema then provides a framework for the retelling process, (Chafe, 1977; Tannen, 1987). Thus, a speaker's feelings toward a speaker may interfere with the construction of the retelling. For example, in a study investigating attitudes and informational recollection, when recalling a story to a peer, participants talked more about their evaluations of the story, included more comments linking the story to a larger knowledge frame (Hyman, 1994). They were also more likely to use remembered details to support their positions (Hyman, 1994). When recalling a story to an experimenter, on the other hand, participants included more story details and interpretations (Hyman, 1994). Similarly, in a study of stereotype maintenance, positive in-group descriptions were abstract and vague, while positive out-group descriptions were specific and verifiable (Whitley & Kite, 2010).

Research in the field of implicit attitudes has proposed that linguistic markers can be used to measure attitudes that are less overt. A speaker's evaluation of a person, for example, can manifest in the manner of their communication, but not in the content (e.g. Franco & Maass, 1996; von Hippel, Sekaquaptewa, & Vargas, 1997). Speakers appear to be unconscious of their linguistic style, so linguistic markers can be used in the implicit measurement of attitudes (Semin, 2006). In repeating the story of a liked or disliked person, the retelling involves both memory of the original story. In addition to the attention the listener gives to the incoming linguistic information,

there is a selection of parts of the story the listener chooses to retell, and a determination of how it is retold. Attitude toward the speaker has been found in the level of language abstraction, where more abstract language is used with in-group speakers, and more concrete language with out-group speakers, *the linguistic intergroup bias* (Maass, Salvi, Arcuri, & Semin). According to the model of this bias, the level of abstraction is defined in terms of the way the actions are described (Semin & Fielder, 1988). The model distinguishes between four levels from concrete language to increasing abstractness. Generally, concrete language involves the use of descriptive actions, and these actions are usually neutral, are observable, and verifiable. In contrast, abstract language involves an interpretation of actions, and refers to mental or emotional states.

An abstract description covertly suggests that the behavior is due to a personality trait, rather than a being product of the situation, while a concrete description gives the impression that the behavior is merely due to the context (Wigboldus, Semin & Spears, 2000). The *stereotype consistency bias* describes the higher rate of stereotype-consistent information than inconsistent information in a message (Kashima, Klein, & Clark, 2007). Research has shown that stereotype consistency bias has two functions of communication- to share information and to regulate relationships (Kashima, Klein, & Clark, 2007). In this way, biased language propagates and maintains existing stereotypes and attitudes. It is expected that this difference for abstract versus concrete descriptions will be seen for liked and disliked

speakers, where the attitude toward the original speaker will be transmitted in the retelling of their narrative implicitly through the use of specific types of words. The fifth hypothesis follows:

Hypothesis 5: When reporting the story of a liked speaker, compared to someone disliked, there will be a greater reference to emotions, a higher rate of tentative words, fewer certainty words, and a higher rate of words related to cognitive mechanisms.

It is predicted that retellings of liked speaker will be more abstract, involving more emotions, and a greater use of tentative words more frequently referring to cognitive mechanisms, words reflecting an interpretation of the the original speaker's mental state. In contrast, it is expected that a negative opinion of the speaker would have an inverse effect on the language production- a lower rate of affect and tentative words, and a higher rate of certainty words.

In addition, the retellings were compared to the original story, measuring how well the reproductions matched the narrative produced by the liked or disliked speakers. Studies of affiliation and verbal and non-verbal behaviour matching have found a positive relationship between mimicry and liking, with more mimicry of liked speech partners, and also a greater liking of the speaker, the more speaker mimicked (Bernieri, 1988; Scheflen, 1964). Studies have found a mimicry of interlocutors on a variety of levels, such as adopting the other's speech rate, and utterance duration

(Capella & Planalp, 1981; Giles & Powesland, 1975). Matching has also been found

at the level of linguistic style. A study measuring the synchrony of verbal behavior

found the level of matching between interlocutors to be significantly related to the

social dynamics between speakers, where verbal mimicry was a reflection of

speakers' cohesiveness in a collaborative task (Gonzales, Hancock, & Pennebaker,

2010). The final hypothesis follows:

Hypothesis 6: When reporting the story of a liked speaker, compared to

someone disliked, there will be a closer match to the original speaker's in terms of

type of word.

It is expected that attitude would affect mimicry, where those who liked the speaker would more closely match the rate of the abstract words, those relating to affect and tentativeness, and deviate more in their rate of the concrete words, those words relating to certainty.

The purpose of the following set of studies is to develop and extend the Context Model, and to determine the effect of a particular social evaluation, *attitude*, on the processing of language. A special focus is placed on the subjective interpretation of contextual information, the way the interpretation affects a listener's perception of a speaker, and the way that this in turn affects language processing. Because people pick up multiple cues from the context, and because listener attitude is a personalized variable, there are individual differences in the degree to which social information is incorporated into the linguistic processing. Studies investigating social cognition and language processing support this idea. For example, listeners who were more empathic reacted more to information that conflicted with stereotypical expectations than those who were less empathic, suggesting that those who were more skilled at empathizing were better at integrating information about the speaker with the message being produced (van den Brink, Van Berkum, Bastiaansen, Tesink, Kos, Buitelaar, and Hagoort, 2010).

Furthermore, listeners may use various contextual cues to form their evaluation of the speaker. The narrative may influence attitude, where shared experiences, for example, may heighten likability; the speaker's prosody or voice may

decrease it. Thus, it is expected that the difference in language processing in all the hypotheses is better explained by the attitude of the listener toward the speaker than by what listeners are told about the speaker. So rather than simply receiving a positive or negative description, or being similar or different to the speaker, and generating an attitude accordingly, the level of liking and subsequent difference in language processing depends on the individual.

Overview of Studies

The first two experiments focused on determining whether such a relationship exists, and whether the type of liking made a difference. In Experiment 1, participants were given overtly positive or negative descriptions of the narrator, and then their comprehension was assessed. In Experiment 2a and 2b, participants first judged their own competence in social and intellectual skills, or on morality, and then were told they were matched with a speaker who was either very similar or very different in these dimensions. The relationship between similarity and liking was assessed, and then the relationship between comprehension, similarity, and liking was investigated. In Experiment 3, participants were again primed with either a positive or negative back-story, and then the effect of this on their retelling of the story was measured through an automated language processor, LIWC, and linguistic style matching (LSM) analysis.

Experiment 1

The purpose of Experiment 1 was to investigate the relationship between attitude and language comprehension. The effect of a listener's liking or disliking on the processing of the speaker's narrative was assessed. Participants were primed with a set of character traits and behaviors, and told they would be listening to students who would be narrating a short story about a memorable event that had recently happened to them. Comprehension was assessed through a short set of multiple-choice questions, and the level of liking, the perceived narrative skills, and how interesting the story was were also measured, all on a scale of 1(not at all) to 7 (very much).

Method

Participants

112 (29 males) native English-speaking University of California students participated in exchange for course credit.

Materials and Procedure

Two compelling, spontaneously-produced personal narratives by a female speaker was selected form a corpus of undergraduate UCSC speakers, and each participant heard one of these two stories. One story was about an injury she sustained while on a trip with her family (Story 1), the other about a music concert

(Story 2). Story 1 was 4 minutes 56 seconds long, and Story 2 was 4 minutes 06 seconds long.

Two back-stories describing the speaker's character were used, one positive and one negative, and two accompanying pictures were selected. These backstories and pictures had been previously normed to ensure each was significantly rated as either strongly positive or strongly negative.The negative backstory described the speaker as outspoken, arrogant, and intimidating, and without many close friends. Also as having a reputation of being a bully, especially towards younger kids, and was suspended in high school for taking pictures of a classmate in a locker room and posting them on Facebook. In the positive backstory, the speaker was characterized as kind, energetic and fun to be around, working as a camp counselor and described by co-workers as motivating and a good role model for kids. Twelve questions were created. The first three questions asked participants to rate how much they liked the speaker, how interesting the story was, and how good of storyteller the speaker was, all on a scale of 1 (not at all) to 7 (very much). The remaining nine questions were based on the content of each story, and were multiple choice, with five options given for each question.

Using SuperLab, participants were first shown the backstory and the accompanying picture, and were told that they would hear this speaker retell a memorable vacation, and that they would then answer some short questions about what they had just heard. Participants then heard one of the memorable event stories,

and were then given the set of impression questions first, in order to encourage

participants to maintain an evaluation when they were answering the content

questions, which they answered next.

Results

A MANOVA analysis was performed to determine the effect of between-

subject factors condition (positive, negative), and story version (Story 1, Story 2) on

accuracy on the story content questions and the three participant ratings (level of

liking, level of competence of the speaker, level of interest in the story). Table 1

summarizes the descriptive results.

Table 1
Resulting mean liking (on a scale of 1 not at all, to 7 very much), story-telling competence (1, not at all good, to 7 excellent) and mean accuracy (percentage, out of 9 questions) for comprehension questions

| | Story 1 | | Story 2 | |
	negative	positive	negative	positive
mean liking	4.07 (1.73)	4.63 (1.21)	3.59 (1.42)	4.40 (1.10)
story-telling ability	4.10 (0.99)	4.37 (1.54)	3.96 (1.09)	4.63 (1.18)
story interest	3.96 (1.37)	3.62 (1.37)	4.03 (1.48)	4.50 (1.19)
mean accuracy	72.2% (25.7%)	83.3% (26.7%)	68.5 % (25.7%)	80.1% (6.82%)

A significant effect of condition was found for all four dependent variables, $F(4,$

$105) = 3.41$, $p = .011$, $\eta_p^2 = .12$, but no effect of story, $F(4, 105) = 0.89$, $p = .50$, η_p^2

$= .03$. There were no significant interaction effects between prime and story version

for accuracy, level of liking, storytelling competence or story interest, $F(4, 105) =$ 0.86, $p = .49$, $\eta_p^2 = .03$.

Univariate ANOVA analyses then tested the effects of condition on each of the three dependent variable, using Bonferroni adjusted levels of .013 per test (.05/4). Results indicated that the level of liking was normally distributed within each condition, but overall, there was significantly higher liking for those in the positive condition, $F(1, 112) = 7.44$, $p = .008$, $\eta_p^2 = .03$. The mean ratings of storytelling ability was significantly higher for those in the positive condition, $F(1, 112) = 4.08$, $p = .01$, $\eta_p^2 = .05$, while the mean difference for how interesting the story was was not significant, $F(1, 112) = 3.65$, $p = .059$, $\eta_p^2 = .00$. Accuracy on the content questions was calculated as a percentage of correctly answered out of the nine questions in total. The mean accuracy for the positive conditions was significantly higher, $F(1,112) = 12.53$, $p = .001$, $\eta_p^2 = .10$.

Since there was no significant difference between the two stories for accuracy or mean liking, data from both were combined in subsequent analyses. There was a significant positive relationship between liking and story-telling competence, $r(112) = .45$, p < .001, and between liking and interest in the story, $r(112) = .27$, $p < .001$. A significant moderate positive correlation between liking and accuracy was found, r$(112) = .48$, $p < .001$, as shown in Figure 1.
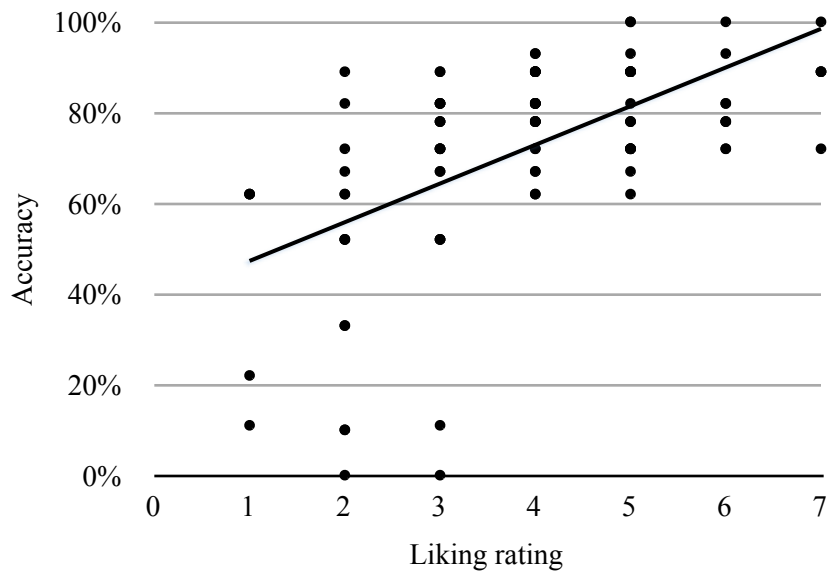
Figure 1. Level of liking versus accuracy on comprehension questions for participants.

There was also a significant correlation between accuracy and storytelling competence, although this relationship was weaker, $r(112) = .25, p = .008$. There was no significant relationship between accuracy and story interest was found, $r(112) = .10, p = .29$.

Finally, a hierarchical regression analysis was performed to determine whether the level of liking, the priming (positive or negative), and the rating of story-telling ability and story interest predicted participants' accuracy on the comprehension questions. Four hierarchical models were tested, and a summary of the statistical results are shown in Table 2. First, a model using condition was compared to one using level of liking as the only predictor. Although both models were significant, the model using the level of liking accounted for 23.2% of the variability, compared to

the 10.0% explained by condition by itself. Next, the combination of level of liking, condition, and rating of story-telling competence was assessed, to determine if these variables contributed to the variance of accuracy over an above liking by itself. Level of liking was entered as step 1, condition as step 2, and then level of story telling competence as step 3. This analysis indicated that together, the level of liking and the priming best explained the variance in accuracy. These two predictors explained 27.3% of the variance ($R^2 = .27$, $F(2, 111) = 20.3$, $p < .001$), where the level of liking ($\beta = 0.48$, $p < .001$), and prime ($\beta = 0.21$, $p = .003$) were found to significantly predict this dependent variable.

Table 2
Results of Regression of Accuracy on Predictor Variables

Model 1	Condition (positive, negative)	0.12	.040	0.31**	.10
Model 2	Level of liking	0.07	.012	0.48**	.23
Model 3	Condition (positive, negative)	0.06	.012	0.43**	.27
	Level of liking	0.08	.032	0.21*	
Model 4	Condition (positive, negative)	0.07	.013	0.48**	.27
	level of liking	0.08	.032	0.21*	
	Storytelling competence	0.02	.014	0.10	

Note: * $p \le .05$, ** $p \le .001$

Discussion

The purpose of this experiment was to test whether the likability of a speaker would affect the accuracy on the comprehension of a story told by that speaker. It was hypothesized that there would be a difference, and it was expected that there would be greater comprehension by those in the positive condition, with a likable speaker, than those in the negative condition, with comprehension measured as the accuracy on a set of multiple-choice content questions.

As expected, condition did affect comprehension, with those in the positive condition achieving a significantly higher accuracy means, 84% (7.9%) compared to 72% (25%) averaged across the two stories. This finding supports the idea that the attitude toward a speaker does interact with a listener's attention to the story.

It was also hypothesized that there would be individual differences of liking within the two conditions, and that these differences would have an effect on comprehension. The results of the experiment support this hypothesis, with participants reporting a range of speaker liking (on a scale of 1 *not at all*, to 2 *very much*). As expected, there was a difference in mean liking between the two conditions, with a mean of 4.5 (1.15) for the positive condition, and a mean of 3.84 (1.49) for the negative condition, averaged across the two stories. While there was this overall mean difference in likability, within each condition, the range of liking ratings was normally distributed, and the individual level of liking was significantly correlated with comprehension. The more a listener liked the speaker, the higher the

accuracy on the comprehension questions. Thus, while there was a significant difference whether the speaker was described favorably or unfavorably, participants were not all equally affected by this given information, and their individual attitude toward the speaker significantly affected how much they paid attention to the speaker's narrative.

As expected, mean ratings of story-telling capability were also significantly related to likability, with a higher level of story-telling ability the more the speaker was liked. This suggests that an overall positive view of the speaker, regardless of whether the speaker was positively or negatively characterized, lead to feelings that the speaker was better at story telling. This difference was also found for how interesting the story was, although the relationship was weaker. This supports the idea that a positive attitude toward a speaker will cause a listener to attribute further positive characteristics, regardless of whether the new attributes are related to the given information. The weaker relationship between liking and story interest may be explained by the interest in the story not being tied so closely to a personal attribute, and so the level of liking has less of an impact on this aspect than it does for narrative skills.

The hierarchical regression analysis tested the ability of the level of liking, the condition type, and the story-telling ability to predict the variance in accuracy. Comparing the four models, the level of liking and the priming together best explained the variance in accuracy ($R^2 = .27$, $F(2, 111) = 20.3$, $p < .001$), where the

level of liking ($\beta = .48$, $p < .001$), and condition ($\beta = .21$, $p = .003$) were found to significantly predict this dependent variable, while the level of story-telling competence did not contribute to the model. This suggests that while the initial prime does predict the final accuracy on the comprehension questions, the actual attitude of the listener towards the speaker has greater explanatory affect on the outcome, but these two measures together were better predictors of accuracy. This again supports the idea that knowing just the condition is not sufficient, and that individual differences matter. Given a positive or negative characterization of a speaker, a listener's attitude toward that speaker is needed to predict how well the listener will attend to, and understand, a speaker's narrative.

Experiment 2

In this experiment, the relationship between the listener to the speaker was manipulated to determine whether there is a difference in involvement, and whether this involvement would affect accuracy in comprehension. Rather than explicitly describing the speaker in positive or negative terms, the attitude of the listener was manipulated by telling the participant that they were either similar or different than the speaker. So rather than a secondary analysis of the speaker, listeners were left to determine their own opinions. And instead of providing a positive or negative likability, speakers based likability on similarity to themselves. Thus, this experiment

explored whether there was a change in liking if the listeners based their liking comparison to themselves, and whether this liking had any effect on comprehension.

Method

Participants

75 (65 female) University of California, Santa Cruz students participated in exchange for course credit.

Materials and Procedure

Participants were first told a backstory about the upcoming speaker they would be listening to. They were told that these speakers were selected from a group whose stories had been collected earlier. These speakers were UCSC students who had previously answered the same questions the current participant was about to answer, and after the participant had finished the quiz, he or she would be randomly selected to be matched with someone who had responded very similarly or very differently than them.

Participants answered two sets of questions, which were counterbalanced. The two stories used were those used in Experiment 1, and were also counterbalanced. For both stories, participants were told they were matched with two similar speakers or two different speakers. In the first set of questions, participants were asked to think about and gauge their own level of social and intellectual ability through a series of 10 questions, five for social, such as "how likely are you to chat to a stranger while

waiting in line at a store", and five for intellectual, such as "how good are you at sudoku?" In a second questionnaire, participants gauged their levels of morality through different scenarios such as "if you saw someone cheating in class, how likely would you be to tell the professor or TA about it?" Participants were presented with either the social/intellectual or morality questionnaire first.

Participants were first primed with a story: they were told that in a previous experiment, students just like them had participated in this experiment, where they had to rate themselves in terms of social/intellectual skills, and morality. These two sets of questions were counterbalanced, so they either answered the social/intellectual questions first, or the morality questions first. For each condition, they were told that they would be randomly assigned to someone who answered very similarly or very differently, although those in the positive condition were told they were matched with two speakers who were very similar, and those in the negative condition were told they were matched with two very different speakers. After they were told they had been matched with someone very similar/very different, they were asked to listen to this person retell a memorable vacation.

After answering the questions, they pressed a button, and after a short pause, they were told that the next speaker was either similar or different to them, based on the questions they had just answered. They then listened to the same story, narrated by a female speaker, used in Experiment 1 and answered the same 10 questions as in Experiment 1.

Results

A mixed-effects MANOVA was performed to determine the effect of between-subject factors prime type (social/intelligence, morality) and the within subjects factor comparison type (similar, different), on accuracy on the story content questions, and the level of liking. Table 3 summarizes the descriptive results.

Table 3
Resulting Mean Liking (SD), Speaker Competence, and Mean Accuracy for Comprehension Questions Following the Two Comparison Types.

	Social/intelligence		Moral	
	different	same	different	same
mean similarity (*SD*)	2.49 (0.76)	3.15 (1.30)	2.24 (1.26)	2.69 (1.06)
mean liking (*SD*)	2.85 (.83)	3.36 (1.11)	2.45 (1.32)	4.54 (1.56)
mean accuracy (*SD*)	75.4% (22.5%)	86.2% (13.9%)	50.6% (18.8%)	64.5% (22.9%)

There was a significant multivariate effect of condition on the three dependent variables, $F(3, 71) = 24.5$, $p < .001$, $\eta_p^2 = .51$, and there was a significant effect of comparison type on these variables, $F(3, 71) = 13.3$, $p < .001$, $\eta_p^2 = .36$. The interaction between condition and comparison type was also significant for these three variables, $F(3, 71) = 4.18$, $p = .009$, $\eta_p^2 = .15$. Univariate ANOVA analyses revealed that there was a significant effect of condition on accuracy, with those who were told they were similar to the speaker achieving greater accuracy than those who were told they were different, $F(1, 73) = 9.14$, $p = .003$, $\eta_p^2 = .111$, and a a greater rating of liking for those in the similar condition, $F(1, 73) = 58.4$, $p < .001$, $\eta_p^2 = .45$, but not for ratings of similarity, $F(1, 73) = 1.04$, $p = .31$, $\eta_p^2 = .01$.

The between subject effect of comparison type was significant for accuracy, with those primed with the social/intellectual comparison achieving higher accuracy than those primed with the morality comparison, $F(1, 73) = 28.7$, $p < .001$, $\eta_p^2 = .28$. However, there was no difference in ratings of similarity between those in the social/ intelligence comparison than the moral prime , $F(1, 73) = 2.35$, $p = .13$, $\eta_p^2 = .011$ There was a significant interaction effect between condition and comparison type for liking, where those in the positive condition liked the speaker more following the morality comparison than after the social/intelligence comparison, $F(1, 147) = 20.63$, $p < .001$, $\eta_p^2 = .13$. There was no interaction between condition and comparison type for feelings of similarity, $F(1, 73) = 2.26$, $p = .13$, $\eta_p^2 = .031$.

There was a significant interaction between prime and condition on liking, with those who were in the similar morality condition liking the listener more than those in the similar social/intellectual condition, $F(1, 73) = 8.23$, $p = .005$, $\eta_p^2 = .10$. There was no interaction between these two independent variables for accuracy, $F(1, 73) = 1.49$, $p = .225$, $\eta_p^2 = .02$, or for similarity, $F(1, 73) = 1.34$, $p = .25$, $\eta_p^2 = .02$.

Because there was a significant effect of prime type on accuracy, the responses from the social/intelligence prime were further analyzed separately from the morality prime. A correlation analysis between accuracy and level of liking for both social/intelligence and morality showed no significant correlation, $r(75) = .129$, $p = .27$, and $r(75) = .18$, $p = .12$, respectively. However, a plot of level of liking versus accuracy is given in Figure 2 for social/intellectual comparison, and Figure 3 for moral comparisons. These plots suggest a quadratic relationship between level of liking and accuracy.
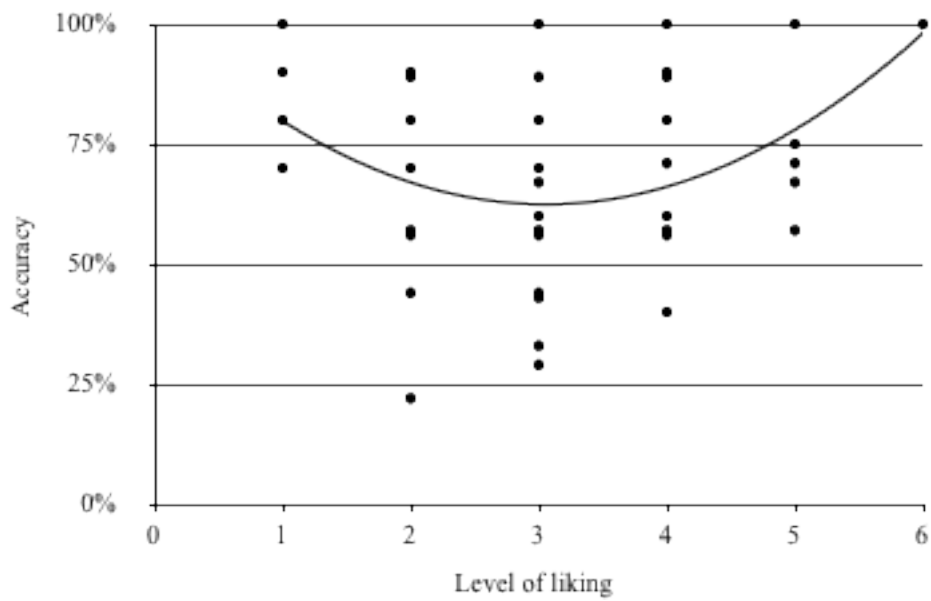
Figure 2. Level of Liking versus accuracy on comprehension questions following social/intellectual prime.
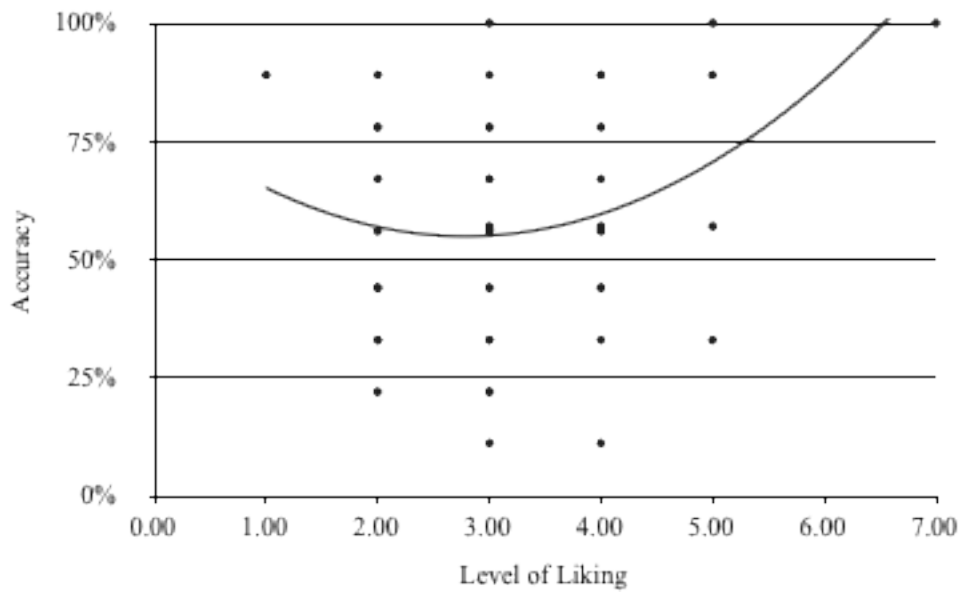

Figure 3. Level of Liking versus accuracy on comprehension questions following morality prime

To test the this relationship between liking and accuracy, a hierarchical regression analysis, with level of liking entered in the first step, level of liking squared in the second, and feelings of similarity in the third step confirmed that a quadratic relationship between liking and accuracy best described the data for both primes, the results are given in Table 4.

Table 4
Results of Regression of the Predictor variables Level of Liking and Level of liking squared on Accuracy Following the Social/Intelligence prime, and the Morality prime.

Model	Predictor Variables	Social/Intelligence					Morality				
		B	SE B	β	R^2	ΔR^2	B	SE B	β	R^2	ΔR^2
1	Level of liking	0.2	0.01	0.12	.02	.02	0.02	.02	0.18	.01	.01
2	Level of liking	-0.16	0.06	-0.72**	.14	.12*	-0.18	.08	-1.54	.09	.08
	Level of liking squared	0.02	0.01	0.89*			0.03	.01	1.77		
3	Level of liking	-0.17	0.06	-0.90*	.14	.02	-0.21	.08	-1.57	.15	.06*
	Level of liking squared	0.02	0.007	0.92*			0.03	.01	1.78		
	Condition (similar, different)	0.02	0.06	0.33*			0.11	.05	0.04		

Note: * p < .05, ** p < .001

For the social/intelligence prime,   Model 2 was determined to be the best predictor of accuracy, with level of liking (β = -1.34, *p* = .005), and level of liking squared (β = 1.51, *p* = .002), which together accounted for 14% of the variance in accuracy (R^2 = .27, *F*(2, 72) = 5.91, *p* = .004). For the morality prime, Model 3 was the best predictor of accuracy, with level of liking (β = -1.01, *p* = .014), level of liking

square ($\beta = 1.05$, $p = .01$), and condition ($\beta = 0.26$, $p = .033$), which together accounted for 14.6% of the variance in accuracy ($R^2 = .27$, $F(3, 71) = 4.56$, $p = .004$).

Finally, the two sets of accuracy primes were compared to the accuracy on the questions in Experiment 2 compared to the accuracy in Experiment 1. An ANOVA analysis with planned contrasts revealed a significant difference between accuracy following the morality comparison compared to the positive and negative primes in Experiment 1 $t(259) = 7.05$ (p < .001), and also a difference between the the social/ intelligence comparison and the primes in Experiment 1, $t(259) = 3.17$, p = .002.

Discussion

The purpose of this experiment was to test the hypothesis that there is a significant difference in comprehension depending on how listeners formed their opinions of the speaker. Rather than being given a set of positive or negative character traits and behaviors, as in Experiment 1, in Experiment 2, participants compared themselves to the speaker on two types of factors: social/intelligence, and morality. Participants were asked to think about their own abilities in these two areas, and then were told that they would be listening to a speaker who was just like them in these abilities, or different. This priming method left it up to the listeners themselves to infer character traits, and to generate an attitude based on these traits. It was expected that this kind of comparison would increase the involvement of the listener,

with regards to both the speaker and the speaker's narrative, and this should in turn affect the level of attention to the narrative, and the resulting accuracy on the comprehension questions. It was also predicted that there would be more of an effect on accuracy when participants were primed with the morality questions, compared to the social/intelligence questions, based on previous literature finding higher emotionality involved with morality, with higher emotionality resulting in greater involvement.

Participants were measured for their feelings of similarity to the speaker (on a scale of 1 *very different*, to 7 *very similar*), their level of liking (1 *very much*, 7 *not at all*), and their accuracy on the comprehension questions. As expected, there was a significant effect of condition on the three dependent variables, with greater feelings of similarity, greater liking, and higher accuracy for those in the similar condition compared to those in the different condition.

It was also found that the comparison type also had a significant effect on accuracy. As expected, when asked to compare themselves to the speaker in terms of social/intellectual skill, participants performed better than those who were just given a description of the speaker in Experiment 1. This suggests that the comparison does increase affect, and this in turn influences the listener's attention to the narrative. However, in contrast to what was predicted, those in the social/intelligence scored higher than those in the moral condition. This suggests that the way participants compare themselves to the speaker impacts their attention to the speaker's narrative.

Contrary to expectation, it appears that the moral comparison is more detrimental to comprehension, where those in both the similar and different conditions performed more poorly than those in the different social/intelligence condition. It is possible that the emotional aspect of the moral comparison is responsible, and so rather than increasing involvement and consequent attentiveness, the increase in emotionality interferes with, and decreases, attention.

Surprisingly, there was no effect of comparison type on feelings of similarity to the speaker, and no interaction effect between condition and comparison type on this dependent variable. It was expected that as with levels of liking, those in the positive condition for both types of comparison would feel more similar than those in the negative conditions. This lack of effect on feelings of similarity may be because participants really did not feel similar after listening to the stories, or they may feel a similarity or difference, but being unwilling to rate themselves as being similar to the speaker.

In contrast to the linear relationship between liking and accuracy found after the positive/negative prime, when primed with similar/different comparisons, there was a quadratic relationship between liking and accuracy. Both liking and disliking the speaker lead to greater accuracy than having strongly positive or negative feelings towards them. The results of the regression analysis confirmed this relationship, where both the level of liking and the squared level of liking together significantly predicted accuracy, whereas level of liking by itself did not. For social/intelligence

priming, 14.2% of the variance in accuracy was predicted by these two predictors. For morality priming, a third predictor, condition, was needed to generate a model that predicted 14.6% of the variance in accuracy. It is possible that this quadratic relationship was not see in Experiment 1 because of the lower degree of involvement. Without this extra aspect to the relationship between listener and speaker, disliking the speaker causes listeners to pay less attention. Whereas if it is present, it serves to increase attention even when there are strong negative feelings.

Experiment 3

In Experiment 3, how the level of liking affected the retelling of a story was explored. Retellings involve both memory of the original story, and also which parts of the story the listener chose to retell, and how they retold it. Participants recounted the story heard by a likable or dislikable speaker by typing out the story, or by verbally retelling it into a microphone, with no addressee present. An LIWC (Linguistic Inquiry and Word Count) analysis was performed on the retellings to determine what kinds of words participants used. This is a bottom-up approach that measures the frequency of words that fall into specific patterns, such as emotional words or words related of cognitive mechanisms, such as *think*, or *seem*. LSM scores were then calculated to assess how well participants' own rates matched with those of the original speaker for words relating to accuracy, cognitive mechanisms, tentativeness, and certainty.

Method

Participants

122 (80 females) University of California students who participated in exchange for course credit.

Materials and Procedure

Participants were primed with the same positive and negative back stories as in Experiment 1, and again listened to two stories. Stories 3 and 4 were selected from the same corpus as stories 1 and 2. Both stories were by female speakers, and both were personal narratives about a memorable trip. Story 3 was 1103 words long, 5 minutes 38 seconds in length. Story 4 was 878 words long, 4 minutes 54 in length. Both stories contained many emotion words such as anger and happiness, and instances of questionable behavior, such as drug use and driving without a license.

Results

The mean length of the typed out retellings was 237 words ($SD = 12.6$), with a range of 61 to 509 words. There was no relationship between the length of the story and the condition or the level of liking. People in the positive prime condition recalled the speaker's name more frequently than those in the negative prime condition, $\chi^2(1) = 3.90$, $p = .05$. There was no difference in word count between genders or between conditions, and there was no correlation with the level of liking.

The mean length of the verbal retelling was 327 words (SD = 20.8), ranging from 60 to 716 words. Again, there was no relationship between the length of the story and the condition or the level of liking. There was no difference in word count between conditions, and there was no correlation with the level of liking, $r(122) = -.12$, $p = .21$.

Each participant's retellings were processed using the LIWC text analysis program (Pennebaker, Booth, & Francis, 2007). Items were selected based on previous literature findings of the difference between attitude and language: affect, emotional words such as *angry* and *excited*; cognitive mechanisms, such as *because*, *think*, and *explain*; and tentativeness, such as *seemed* or *appeared*. A MANOVA analysis was performed, comparing the effects of the four independent variables: story type (Story 3, Story 4), production type (written, spoken), and condition (negative, positive), and level of liking (on a scale of 1 to 7) on the five dependent variables: the rate of words relating to affect, cognitive mechanisms, tentativeness, certainty, and word count. The descriptive results of this analysis for Story 3 are shown in Table 5 and for Story 4 in Table 6.

Table 5
Rate of Words Related to Affect, Cognitive Mechanisms, Tentativeness, and Certainty Used in the Story 4, and Produced in the Written and Spoken Reproductions.

		Story 3			
		Written		Spoken	
	Original				
DV		Negative	Positive	Negative	Positive
Word count	1103	263 (78)	218 (136)	237 (141)	285 (133)
Affect (*SD*)	5.02	3.74 (1.04)	5.49 (1.40)	2.90 (1.15)	3.63 (1.45)
Cog. mech (*SD*)	22.65	14.39 (2.80)	15.21 (3.14)	17.67 (2.10)	18.88 (2.50)
Tentativeness (*SD*)	2.70	1.39 (0.83)	1.69 (0.64)	1.44 (1.66)	2.50 (1.52)
Certainty (SD)	1.18	0.83 (0.62)	1.10 (1.04)	0.68 (0.53)	0.53 (0.58)

Table 6

Rate of Words Related to Affect, Cognitive Mechanisms, Tentativeness, and Certainty Used in the Story 4, and Produced in the Written and Spoken Reproductions.

		Story 4			
	Original	Written		Spoken	
DV		Negative	Positive	Negative	Positive
Word count	878	232 (115)	171 (75)	376 (181)	370 (171)
Affect (*SD*)	4.02	3.68 (1.46)	6.21 (2.90)	2.62 (1.10)	3.89 (1.46)
Cog. mech (*SD*)	23.08	16.86 (2.87)	17.69 (3.94)	16.86 (3.94)	19.68 (1.98)
Tentativeness (*SD*)	2.00	1.29 (.92)	1.98 (.74)	3.09 (1.39)	3.95 (1.31)
Certainty (SD)	1.18	0.61 (0.62)	0.91 (0.83)	0.72 (0.18)	0.53 (0.65)

This analysis revealed an overall significant effect of all four independent variables: level of liking, $F(3, 111) = 2.62$, $p < .001$, $\eta_p^2 = .16$, condition, $F(3, 111) = 7.45$, $p < .001$, $\eta_p^2 = .21$, story, $F(3, 111) = 6.31$, $p < .001$, $\eta_p^2 = .19$, and production mode, $F(3, 111) = 17.15$, $p < .001$, $\eta_p^2 = .38$. Univariate ANOVA analyses where then performed to test the effects of these variables on the five dependent variables, using

Bonferroni adjusted levels of .010 per test (.05/5). Results from these analyses revealed

a significant effect of condition, with those in the positive condition producing a

greater rate of words associated with affect $F(1, 114) = 25.9$, $p = .011$, $\eta_p^2 = .19$, and

with tentativeness, $F(1, 114) = 12.69$, $p = .001$, $\eta_p^2 = .08$. But there was no difference

between the two conditions for cognitive mechanisms, $F(1, 114) = 5.51$, $p = .021$, η_p^2

$= .05$, or certainty, $F(1, 114) = 0.19$, $p = .67$, $\eta_p^2 = .002$.

There was a significant effect of liking on the rate of affect words, $F(1, 114) =$

9.45, $p < .001$, $\eta_p^2 = .40$, but not for cognitive mechanisms, $F(1, 114) = 9.45$, $p < .$

001, $\eta_p^2 = .40$, tentativeness, $F(1, 114) = 9.45$, $p < .001$, $\eta_p^2 = .40$, or certainty, $F(1,$

$114) = .53$, $p = .78$, $\eta_p^2 = .04$. There was also a significant effect for story type, where

retellings of story 4 involved a higher rate of words related to affect $F(1, 114) = 7.18$,

$p = .008$, $\eta_p^2 = .06$, and to tentativeness, $F(1, 114) = 25.25$, $p < .001$, $\eta_p^2 = .18$. There

was no difference between the two for for cognitive mechanisms, $F(1, 114) = 2.48$, p

$= .12$, $\eta_p^2 = .02$, for certainty, $F(1, 114) = 1.31$, $p = .25$, $\eta_p^2 = .01$, or for word count, F

$(1, 114) = 2.48$, $p = .12$, $\eta_p^2 = .02$ The only interaction effect occurred between

production mode and condition for affect, with the rate of affect increased more by

the positive condition when spoken than when typed, $F(1, 114) = 9.81$, $p = .002$, η_p^2

$= .08$.

Production mode was the only variable that affected word count, with a

higher count for spoken than for written, $F(1, 114) = 7.69$, $p = .007$, $\eta_p^2 = .06$.

Production mode also affected the other four dependent variables, with written

reproductions using a higher rate of affect words, $F(1, 114) = 26.94$, $p < .001$, $\eta_p^2 = .$

15, and certainty words, $F(1, 114) = 3.86$, $p = .05$, $\eta_p^2 = .03$, but spoken reproductions

producing a higher rate of words relating to cognitive mechanisms, $F(1, 114) = 12.39$,

$p = .001$, $\eta_p^2 = .10$, and tentativeness, $F(1, 114) = 13.20$, $p < .001$, $\eta_p^2 = .11$.

Next, a hierarchical regression analysis was performed. To simplify the

analysis, based on the results of the univariate analysis, only the level of liking and

production mode were assessed for their ability to predict the rate of each of the

lexical types, regardless of story or condition. Liking was entered as step 1, and

production mode as step 2. The results of this analysis are shown in Table 7.

Table 7

Summary of level of liking (on a scale of 1, not at all, to 7, very much) and LIWC output of multiple regression analysis.

			Typed Reproduction			
DV	Mod el	IV	B	$SE\ B$	β	R^2
Affect	1	Level of liking	0.65	.08	0.61**	.34**
	2	Level of liking	0.63	.08	0.50	.42**
		Production mode	-0.75	.23	-0.22	
Cog. Mech.	1	Level of liking	0.32	.21	0.14	.02
	2	Level of liking	0.38	.19	0.16	.25**
		Production mode	3.60	.59	0.48	
Tentative	1	Level of liking	0.30	.08	0.32	.10**
	2	Level of liking	0.32	.07	0.34	.31**
		Production mode	1.34	,23	0.45	
Certainty	1	Level of liking	-0.03	.04	-0.06	.004
	2	Level of liking	-0.03	.04	-0.07	.05
		Production mode	-0.28	.11	-0.21	

 Note: *$p \leq .05$, ** $p \leq .001$

This analysis revealed that for affect, cognitive mechanisms, and tentativeness, both level of liking and production mode account for significantly more variance than level of liking alone. For affect, level of liking, ($\beta = .60$, $p < .001$), and production mode, ($\beta = -2.22$, $p = .002$), accounted for 42% of the variance, ($R^2 = .42$, $F(2, 119) = 43.3$, $p < .001$). For the rate of words associated with cognitive mechanism, level of liking, ($\beta = .16$, $p = .05$), and production mode, ($\beta = .48$, $p < .001$), accounted for 25% of the variance, ($R^2 = .25$, $F(2, 119) = 19.9$, $p < .001$), and for tentativeness, level of liking, ($\beta = .34$, $p < .001$), and production mode, ($\beta = .45$, $p < .001$), accounted for 31% (R^2

= .31, $F(2, 119) = 26.3$, $p < .001$). Neither level of liking nor production mode were found to be significant predictors of certainty, ($R^2 = .05$, $F(2, 119) = 2.99$, $p = .07$)

Because the focus of this research was on the relationship between the speaker and the listener, the next analysis compared the response of the listener to the initial story of the speaker. This was done by calculating the Linguistic Style Match (LSM) scores for each story for affect, cognitive mechanisms, and tentativeness, which shows the amount of similarity of the reproduction from the original. The LSM score for each participant and for each item was calculated using the formula [1 - │(Speaker - Participant)│/(Speaker + Participant)], with the resulting score providing a measure of similarity on a scale of 0 (no similarity) to 1 (complete match). The descriptive results are given in Table 8 and Table 9.

Table 8
LSM Rate of Words Related to Affect, Cognitive Mechanisms, Tentativeness and Certainty Used in the Written and Spoken Reproductions in Story 3.

	Story 3			
	Written		Spoken	
DV	Negative	Positive	Negative	Positive
LSM Affect (*SD*)	.83 (.13)	.89 (.07)	.71 (.19)	.78 (.13)
LSM Cog. mech (*SD*)	.76 (.07)	.80 (.10)	.89 (.06)	.90 (.07)
LSM Tentativeness (*SD*)	.62 (.27)	.74 (.18)	.58 (.33)	.80 (.20)
LSM Certainty (SD)	.57 (0.34)	.54 (.40)	.50 (.36)	.38 (.31)

Table 9

LSM Rate of Words Related to Affect, Cognitive Mechanisms, Tentativeness and
Certainty Used in the Written and Spoken Reproductions in Story 4.

	Story 4			
	Written		Spoken	
DV	Negative	Positive	Negative	Positive
LSM Affect (*SD*)	.82 (.18)	.81 (.13)	.70 (.15)	.83 (.12)
LSM Cog. mech (*SD*)	.79 (.11)	.80 (.06)	.88 (.09)	.92 (.05)
LSM Tentativeness (*SD*)	.55 (.33)	.79 (.19)	.85 (.09)	.79 (.13)
LSM Certainty (SD)	.49 (.38)	.63 (.29)	.66 (.17)	.38 (.33)

A MANOVA was then performed to determine the effect of liking, condition, story, and production mode on the four dependent variables. There was a significant effect of level of liking $F(24, 332) = 2.20$, $p = .67$, $\eta_p^2 = .137$, and production mode, $F(4, 80) = 16.11$, $p < .001$, $\eta_p^2 = .45$. There was no effect of condition, $F(4, 80) = 1.72$, $p = .16$, $\eta_p^2 = .008$, and no effect of story, $F(4, 80) = 0.17$, $p = .92$, $\eta_p^2 = .009$. There were no significant interactions.

A set of univariate ANOVA analyses was then performed, with a Bonferroni correction of 0.013 (0.5/4). These analyses revealed that production mode only affected the matching of cognitive mechanism word rate, with a higher LSM score for written than for verbal reproductions, $F(1, 83) = 63.9$, $p < .001$, $\eta_p^2 = .44$. There was no effect of production mode for LSM scores of tentative words, $F(1, 114) = 5.91$, $p = .02$, $\eta_p^2 = .05$, certainty words, $F(1, 114) = 4.21$, $p = .042$, $\eta_p^2 = .03$, or affect words, $F(1, 114) = 3.59$, $p = .061$, $\eta_p^2 = .03$. The level of liking significantly affected the

LSM score of affect words, with greater matching with the original speaker the more the speaker was liked, $F(1, 114) = 26.48$, $p < .001$, $\eta_p^2 = .19$. There was no difference for certainty words, $F(1, 114) = 3.27$, $p = .07$, $\eta_p^2 = .03$, cognitive mechanism words, $F(1, 114) = 5.88$, $p = .02$, $\eta_p^2 = .05$, or tentative words, $F(1, 114) = 0.04$, $p = .84$, $\eta_p^2 = .001$.

Discussion

The purpose of this study was to investigate whether the attitude of a listener toward a speaker would affect the way the speaker's story was retold by the listener. Previous literature has found that the relationship between speaker andlistener, and speaker and the person being spoken about, affects the use of concrete versus abstract language. People describe positive behaviors of others close to them in abstract terms, but with concrete terms about those they are not close to. Here, we examined whether liking or disliking a speaker would affect the way in which the speaker's narrative is retold. The use of specific types of words, those associate with affect, with cognitive mechanisms, with tentativeness, and with certainty were measured to determine whether liking or disliking a speaker would influence the use of these types of words in the retelling.

Participants were primed with the same background stories and pictures as in Experiment 1, listening to either a positively or negatively characterized speaker. A new set of stories were selected that contained high levels of emotions and evaluation. After listening to the story, they then either typed out everything they could remember

from that story, or verbally retold it, without an addressee present. The retellings were then processed using LIWC, and further analyzed.First, the effect of condition, level of liking, story type, and production mode, on word count, and the rates of words associated with affect, cognitive mechanisms, tentativeness, and certainty, were tested. The hypothesis for this set of tests was that there would be a difference between these two conditions for the four rates of word types. It was predicted that there would be a higher rate of affective words, tentative words, and words relating to cognitive mechanisms for those primed with the positive set of speaker characteristics, and a higher rate of certainty words for those in the negative condition. This effect of condition was found for affect and for tentativeness, but there was no difference for the rate of words relating to cognitive mechanisms or certainty. One reason for this may be that the process of having to remember and retell the story may interfere with these two types of words, dampening any differences that the feelings toward the listener may have had.

It was expected that the individual differences in liking would significantly affect the rates of these items. Regardless of the condition, it was predicted that the more the listener liked the speaker, the more affective, tentative, and cognitive mechanism words would be used. The less a listener liked the speaker, the higher the rate of certainty words in their retelling. liking only affected the rate of affect words, with a higher rate for liked versus disliked speakers. There was no difference found for cognitive mechanisms, tentativeness, or certainty. Again, this may be due to the

cognitive load of the task, where the difficulty of the task may affect how speakers use these types of words. It is also possible that not having an immediate audience may also affect how the stories are retold. For both production modes, participants were asked to report as much of the story as they could, and so the task may be different than a natural retelling to an actual listener. These types of words may be a way for speakers to covertly convey their opinions, rather than being a symptom of their opinions, and so without an active addressee, these linguistic items are not expressed.

As expected, word count was only affected by production mode, with more words produced when the story was reported verbally than when written. Although intuitively, it is possible that participants would retell a shorter story for a disliked speaker, due to a desire to minimize speaking about them, this was not found to be the case. There was also no effect of story on the word count, even though there was an actual difference between the two stories (1103 words and 878 words).

The production mode was found to also affect the rate of words related to affect, cognitive mechanisms, tentativeness and certainty. rate of affect words and cognitive mechanisms was higher in the written reproductions than in the spoken versions. The higher rate of cognitive mechanisms in the verbal retellings may explain the lower rate of affect words. The words relating to cognitive mechanisms include the items such as "I think", and so if speakers had more difficulty retelling the story verbally, they would be less likely to include affect words in their stories. It is

also possible that the cost of adding "I think" to writing was higher, being something students are trained to avoid, and also requiring extra typing.

Overall, it appears that of the four predictors, the level of liking and the production mode had the most effect on the rates of the lexical items. The regression analysis supports this idea, with the combination of these two independent variables significantly predicting 42.0% of the variance in the rate of affect words, 31.3% of the variance in the rate of tentative words, and 25.1% of the variance in rate of cognitive mechanism words.

Comparing the mean rates of the four lexical items to that of the original (Table 5 and Table 6) indicates that regardless of story, those in the positive condition who typed their retellings had a rate of affect words that was higher than that of the original. Thus, speakers are not just better at recollecting the aspects of the narrative that contain emotions, but they also add more emotions when they retold the story. This discrepancy was also found with tentativeness, where those in the positive prime and who typed out their response often produced a higher rate of tentative words than was used by the original speaker. Again, this suggests that listeners in this condition are not just better at reproducing the same rate of tentativeness as the person they were listening to, but they also added in their own tentative words.

The calculated LSM scores allow for an assessment for how well a listener's retelling matched that of the original narrator's in terms of these four dependent variables. It was predicted that there would be higher matching for those in the

positive condition than in the negative condition, and a greater matching the more a listener liked the speaker. This was not found to be true for condition. However, there was an effect for liking, where those who disliked the speaker had lower rates of affective words. There was, however, no effect of condition for matching of the other three dependent variables.

Overall, this study predicted that there would be an effect of liking on the rate of words relating to affect, cognitive mechanisms, tentativeness, and certainty. Supporting this hypothesis, the rate of affect words was in fact found to be affect by positive feelings toward the speaker. The highest matching of lexical type to that used by the original speaker was also found for affect. There was less support for the effect of attitude on the rate of cognitive mechanisms, tentativeness or certainty.

General discussion and conclusion

The set of experiments in this study sought to investigate the influence of attitude on language processing. Multiple language processing models include the context in the description of how incoming language is affected by higher-order knowledge. The Context Model (van Dijk, 2009) extends this idea further, placing a listener's mental structures as a filter for the incoming message. It is the listener's subjective interpretation of the contextual information that acts as a moderator between the information given in the language, and the information contained in the social context. However, no studies to date have investigated the way that the attitude

of a listener toward a speaker, how much the speaker is liked of disliked, will affect comprehension of the speaker's narrative. The results of this study, then, support and build on the Context Model, allowing for predictions of how this aspect of the relationship between speaker and listener will affect language comprehension.

The impact of attitude on comprehension was tested through three experiments. In all three experiments, participants were primed in order to manipulate their feelings toward the speaker. In Experiments 1 and 2, participants then listened to a short narrative by that speaker, and their comprehension of the narrative was measured through a set of multiple choice questions. In Experiment 3, participants were asked to retell the story, either through writing or verbally reproducing the story, and the contents of the retellings were analyzed for the rates of words relating to affect, cognitive mechanisms, tentativeness, and certainty. These measurements were used to analyze whether liking or disliking a speaker affected a listener's use of particular lexical categories when they retold the speaker's story.

Experiment 1 was designed to test Hypothesis 1, that the attitude of a listener toward a speaker will affect attention to the speaker's message. Specifically, it was predicted that those in there would be greater attention, and subsequent comprehension, by those in the positive condition, with a likable speaker, than those in the negative condition. Comprehension was measured as the accuracy on a set of the content questions. As expected, condition did affect comprehension, with those in the positive condition achieving a significantly higher accuracy means, than those in

in the negative condition. This finding supports Hypothesis 1, giving evidence for the idea that the attitude toward a speaker does interact with a listener's attention to the story, and that a listener's comprehension is better for speakers who are described positively than those who are negatively portrayed.

This experiment also allowed for the testing of Hypothesis 2, which predicted that there would be individual differences in the uptake of the character information, that these differences would affect the level of liking towards that character, and that this level of liking would be significantly correlated with accuracy on the comprehension questions. The results from Experiment 1 also provides evidence this hypothesis, where a significant linear relationship was found between level of liking and accuracy, regardless of the valence of the character description. This provides support for the Context Model, demonstrating how a listener's interpretation of the social information is subjective, and a measurement of this individual attitude significantly predicts comprehension of the speaker about whom the attitude is formed.

Experiment 2 tested Hypotheses 3 and 4. This experiment manipulated the way that the attitude about the listener was formed. Rather than being presented with a description of the speaker, participants were first asked to consider themselves in terms of social/intellectual ability, and morality, and then compare themselves to the listeners. Both hypotheses predicted that whether listeners were told that they were similar to different to the speaker would affect comprehension, and affect it at a

different level than the likable/dislikable prime. It was expected that the extra

cognitive processing involved in the comparisons to self would improve involvement

with the speaker, and this would in turn increase comprehension. It was also predicted

that the comparison in terms of morality would increase involvement even more,

resulting in even greater comprehension for those listeners who were told they were

similar to the speaker in in this aspect, regardless of whether listeners were told they

were similar or different to the speaker.

As expected, after both these comparisons, participant accuracy was affected,

and the effect was different than for the likable/dislikable prime, supporting

Hypothesis 3. For both tests, there was a quadratic relationship between liking and

accuracy. While the comparison to self did not appear to improved overall mean

accuracy for all participants, the increased involvement led to greater accuracy for

those who both did and did not like the speaker compared to those who had not so

strong feelings. Contrary to expectation, the morality priming had a negative effect

on comprehension compared to the likable/dislikable prime. This could be explained

by the possible increase in emotionality involved with moral reasoning, which could

interfere with narrative comprehension. Thus, Hypothesis 4 was not supported.

The purpose of Experiment 3 was to investigate whether the attitude of a

listener toward a speaker affects the way the speaker's story was retold by the listener,

Hypothesis 6. Previous literature has found that the relationship between speaker and

listener, and speaker and the person being spoken about, affects the use of concrete versus abstract language. People describe positive behaviors of others close to them in abstract terms, but with concrete terms about those they are not close to. Here, we examined whether liking or disliking a speaker affected the rate of affect and tentative words used, factors in abstract language, and the rate of certainty words, a factor in concrete language. The comparison of the rate of affect words for retellings of liked and disliked speakers partially provided support for this hypothesis. the priming condition affected the rate of affect words and tentative words, with a higher rate produced by retellers in the positive than the negative condition. However, no effect on the rate of words associated with cognitive mechanisms or certainty was found. The level of liking was found to affect the rate of affect words used, with a higher rate the more the original speaker was liked. However, no effect was found for the other three lexical item types.

The level of matching of the reteller to the original speaker was also assessed through an LSM analysis, which tested Hypothesis 6. Attitude was expected to affect mimicry, where those who liked the speaker would more closely match the rate of the abstract words, those relating to affect, cognitive mechanisms, and tentativeness, and deviate more in their rate of the concrete words, those words relating to certainty. In contrast, it was expected that a negative opinion of the speaker would have an inverse effect on the language production- a less matching in terms of affect and tentative words, and a higher rate matching of certainty words. The results partially support

Hypothesis 6, where a greater rate of matching was found for affect words in the positive condition than the negative condition. However, there was no difference in matching in the rate of words relating to cognitive mechanisms, tentativeness, or certainty. It is possible that this lack of effect for these three types of words may be because of both the nature of the task, with recall being more cognitively taxing than normal discourse, and the lack of a present addressee.

Taken together, this set of experiments supports the Context Model of language processing, and extends this model by providing evidence for the effect of attitude on language comprehension and production. The studies also show how the effect occurs, with less attention paid to disliked speakers, and a greater focus on affect for liked speakers when retelling the speaker's words. To explain the *how* context affects language comprehension, the Context Model must specify in what way this higher-level information influences the processing of incoming linguistic input. Results from this study suggest that attitude causes attention to the speaker's words to be generally attenuated, with listeners paying less attention to unlikable speakers. The model should also show how social context influences recall. Here, it was shown that attitude affects the production of a certain type of word- those associated with emotion. These findings specifically show the mechanism behind the influence of social knowledge on lower-level language processing.

Possible future studies may focus on exploring the results of Experiment 3. A qualitative analysis of the kind of information recalled, comparing retellings by those positively primed to those negatively primed, could provide an explanation of how attitude affects attention. Such an examination could allow for an item analysis, revealing whether, for listeners, there is a global effect on what is attended to, or if listeners paid particular attention to certain types of information, such as those involving evaluations or emotions. An analysis of the specific words used may also reveal a difference between positively and negatively primed listeners. Discourse markers are one class of words that may be used differently depending on the listener's feelings about the listener. It has been found that the relationship between speakers, whether the interlocutors were friends or strangers, affected the types discourse markers used. Strangers used a higher rate of reception markers, such *oh* and *okay*, whereas friends used more presentation markers, such as *like* and *you know* (Jucker & Smith, 1998). Although the retelling does not involve interaction, it is possible that the attitude of a listener will affect the rate of these types of presentation markers in their retelling, with a higher rate for those who like the speaker than those who do not. These additional analyses would better illuminate the effect of attitude on language processing, allowing further elucidation of the mechanism underlying this effect.

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