2-6-2012 12:00 AM

Investigating The Necessary Components of a Sarcastic Context

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A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Psychology

INVESTIGATING THE NECESSARY COMPONENTS OF A SARCASTIC CONTEXT

(Spine title: Investigating Components of Sarcastic Context)

(Thesis format: Monograph)

by

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Graduate Program in Psychology

A thesis submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

The School of Graduate and Postdoctoral Studies
The University of Western Ontario
London, Ontario, Canada

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entitled:

Investigating the Necessary Components of Sarcastic Context

is accepted in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Date____Feb., 6th, 2012_____ _____
Chair of the Thesis Examination Board

Abstract

This research is designed to investigate the contextual components utilized to convey sarcastic verbal irony, testing whether theoretical components deemed as necessary for creating a sense of irony are, in fact, necessary. A novel task was employed: Given a set of statements that out-of-context were not rated as sarcastic, participants were instructed to either generate discourse context that would make the statements sarcastic or meaningful (without further specification). In a series of studies these generated contexts were shown to differ from one another along the dimensions presumed as necessary (failed expectation, pragmatic insincerity, negative tension and presence of a victim) and along stylistic components (as indexed by the Linguistic Inquiry Word Count or LIWC). However, none of these components were found to be necessary. Indeed in each case the items rated as highest in sarcasm were often at the lowest levels on the putative "necessary" characteristic.

The ratings were then used to develop an online reading task to investigate the effect of negative tension on the processing of sarcastic and literal statements. Three groups of items were taken from the previous studies to form high negative tension; low negative tension; and literal statements. Reading times for seven key areas were compared across the three groups and it was found that in two of the critical areas, the low negative items were processed significantly more slowly than the other two sets of items. The literal and high negative items however did not differ significantly in their processing times. These findings support the predictions of direct access models and contradict the predictions of the standard pragmatic model of language processing. The findings from the studies are seen as consistent with constraint satisfaction models of sarcasm processing in which various

linguistic and extralinguistic information provide probabilistic (but not necessary) support for or against a sarcastic interpretation.

Keywords: sarcasm, irony, implicit display model, allusional pretense model, pragmatics, psycholinguistics, online processing, figurative language

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CHAPTER ONE: INTRODUCTION

Over the past two decades, irony has been increasingly studied by researchers in many disciplines (Gibbs & Colston, 2007). The focus of this paper will be limited to the form of irony known as *verbal irony,* a figure of speech in which the meaning that is communicated is the opposite of the meaning that would be communicated if used literally. In other words, when referring to verbal irony generally one is describing a linguistic expression that is the contrary to the reality that is being experienced, or at least it is comprehended as a dismissal of the position being expressed (Katz, 2008). For example if someone says, "Nice hair" to someone who has just received a horrible haircut, therefore intending to express, "Bad hair", then this comment would be considered verbal irony (Gibbs & Colston, 2007).

Researchers over the years have proposed that sarcasm is a variant of verbal irony (Colston, 2000; Lee & Katz, 1998) and the emphasis in this paper will be sarcastic verbal irony. Sarcastic verbal irony is seen by many as having the characteristics of verbal irony with the addition of the existence of a victim (Lee & Katz, 1998). In their studies of verbal irony, many researchers have in fact asked participants to give ratings of sarcasm and not irony *per se*. (e.g., Colston, 2000). Moreover, Gibbs (1994) provides an inclusive examination of the psychological literature dealing with figurative language and finds that sarcasm is treated interchangeably with verbal irony. In this investigation we will examine the contextual characteristics of sarcastic verbal irony, rather than simply verbal irony. More specifically, the paper focuses on the discourse context necessary to initiate comprehension of sarcastic verbal irony.

One of the reasons that sarcasm has been of interest to a variety of researchers, ranging from philosophers, linguists and cognitive psychologists is because of the challenge it poses to those trying to develop a comprehensive theory of language comprehension (Colston, 2000), especially given the frequency of its usage. In sarcastic verbal irony one asserts a statement that expresses something that is contrary to reality but, does so with the expectation that the utterance will be understood. This contradiction poses a theoretical difficulty: How do people understand such comments when there is a mismatch between the intended (speaker) meaning and the meaning of the words being used (utterance meaning). This difficulty is compounded because the utterance meaning on the surface can, in principle, be a mismatch with intended meaning.

Given that there is a mismatch between the speaker meaning and the utterance meaning, additional information or conditions would seem necessary in order to successfully convey the desired sarcastic intent. One source of this additional information or condition(s) is, arguably, found in the discourse context within which the statement is embedded. In essence, the question studied here will be whether there are necessary conditions found within the contextual discourse information that initiates successful comprehension of sarcastic verbal irony. That is, can we identify characteristics which define an *ironic/sarcastic context* or *ironic/sarcastic environment* in the preceding discourse that initiates a sarcastic verbal irony understanding?

Several researchers have put forth theories pertaining to verbal irony comprehension relevant to the question addressed here. (e.g., Giora, 2003; Kumon-

Nakamura, Glucksberg & Brown., 1995; Utsumi, 2000). Contained within these theories, the researchers make claims (implicitly or directly) regarding the conditions that must be present in order for sarcastic irony comprehension to successfully take place (Gibbs & Colston, 2007). The following section reviews these theories.

Review of Verbal Irony/Sarcasm Theories

Allusional Pretense Theory

According to the allusional pretense theory the necessary conditions to elicit conversational irony are *allusion to failed expectations* and *pragmatic insincerity* (Kumon-Nakamura, Glucksberg & Brown, 1995). These are conditions that, according to the theory, must be present within the greater contextual information provided in order to achieve the desired understanding of the ironic utterance.

An allusion to failed expectation refers to a discrepancy between a certain expectation and the reality that actually occurs at a later time (Kumon-Nakamura et al., 1995). If we consider the example given earlier of the individual stating *"Nice hair!"* to someone who has just received a bad haircut, the expectation is that people want to get "good" haircuts when they visit the barber/hairstylist and the reality is that the individual on this occasion did not receive a "good" haircut. By stating *"Nice hair*" to this individual then, the speaker is alluding to the failed expectation that the individual had desired a good haircut but in reality did not get what they were expecting. This would be an example of an implicit allusion to failed expectations in that the expectation for a good haircut was assumed, as a social norm, to be the desired outcome. If the context

contained within it a statement such as *"I am going to get my haircut today and it is going to be a great haircut"*, then the ironic utterance of "Nice hair" would be considered as an *explicit* allusion to failed expectation (Colston, 2000).

The second necessary component proposed by Kumon-Nakamura et al. (1995) is *pragmatic insincerity*, in which the speaker does not sincerely intend to communicate what his or her utterance is generally supposed to imply (Colston, 2000). This characteristic follows from the felicity condition, as originally discussed by Austin (1962) and later elaborated on by Searle (1979; see Colston, 2000): an assumption that a speaker, when performing a well-formed speech act, is being truthful or sincere in what they are saying (sincerity condition). Looking again at our "Nice hair" example, according to the sincerity condition of a well formed speech act, when the speaker states "nice hair" there is an assumption that he or she means that they believe the individual received a nice haircut. However, when being ironic, the individual is not intending the compliment and therefore they are being *insincere*. The insincerity is described as pragmatic because it does not apply to the semantic properties of an utterance, but instead applies to how the language is used (i.e., the pragmatic level) (Colston, 2000). To recap, according to the allusional pretense theory two necessary conditions for the interpretation of verbal irony are the presence of an allusion to failed expectations (implicit or explicit) and pragmatic insincerity on the part of the speaker.

Implicit Display Model (Utsumi, 2000)

A more recent theoretical approach, implicit display theory (Utsumi, 2000), provides an additional contextual constraint. Utsumi (2000) proposes a theory of verbal irony called the *Implicit Display Model*. According to the implicit display model an utterance of verbal irony implicitly displays an ironic environment and it is proposed that verbal irony is a prototype-based category (Utsumi, 2000). The claim by the implicit display model is that the identification of the ironic environment is done by "checking or inferring its constituent events/states" (Utsumi, 2000, pp. 1781).

According to implicit display theory, if a statement is going to be interpreted as ironic, it must be identified as coming from or being embedded within an ironic environment. Utsumi argues the ironic environment consists of three events:

1. The speaker has a certain expectation (*E)* at time (*t).*
2. The speaker's expectation (*E)* fails.
3. The speaker has a negative emotional attitude toward the incongruity between what is expected and what actually is the case.

If the accompanying discourse context contains these conditions then the situation is surrounded by an ironic environment (Utsumi, 2000). It is necessary, according to the implicit display theory, that for a statement to be considered sarcastic/ironic it has to be contained within such an environment (Utsumi, 2000).

The second key aspect proposed by the implicit display theory is that an ironic communication presumes the implicit display of an ironic environment. This is accomplished when an utterance:

1. "Alludes to the speaker's expectation (E)
2. Includes pragmatic insincerity by intentionally violating one of the pragmatic principles, and
3. Expresses indirectly the speaker's negative attitude toward the failure of (E)" (Utsumi, 2000, pp.1785).

Implicit display theory attempts to describe the comprehension of sarcasm/irony by way of prototype category initiation. More specifically, according to implicit display theory, we interpret sarcasm/irony by recognizing the statement as belonging to or being imbedded within an environment that initiates the category of irony or sarcasm. The key claim of the implicit display theory, for the purposes of this thesis, is that in order for a statement to be seen or recognized as ironic, the surrounding environment or context should contain the particular cues that create the ironic context, which according to the theory are allusion to a failed expectation and negative tension. It should be noted that Utsumi (2000) is a theoretical article and no empirical support for his proposals is provided. One aim of the studies completed here is to subject his theory to empirical testing.

Presence of a Victim

Dictionaries often define sarcasm as stating the opposite of an intended meaning especially in order to insult or mock a person, situation or thing. In other words, sarcasm is often defined as irony with a victim (Jorgensen, 1996). Indeed, Lee and Katz (1998) claims that sarcastic discourse requires the ridicule of a victim to distinguish it from ironic discourse. There is a limited literature on the necessity for sarcasm to have a victim or specific target of the barb.

Lee and Katz (1998) presented to participants various comments in which sarcasm was presented within a discourse context. Of importance here, the passages varied on the presence or absence of a specific victim of ridicule, and the participants were asked to provide a rating of the target sarcasm on how good an example of sarcasm it is. The ratings were provided on a 7-point scale ranging from 1 (very poor example) to 7 (very good example). In Experiment 1, Lee and Katz found that the manipulation of a victim accounted for more than 35% of the variance in the degree of sarcasm conveyed while in Experiment 2 the ridicule accounted for 38% of the variance in the degree of sarcasm conveyed (Lee & Katz, 1998). Thus both experiments show a similar pattern in that the presence of ridicule aimed at a specific victim plays a significant role in conveying sarcasm.

A subsequent experiment, by Toplak and Katz (2000), attempted to identify characteristics that made the victim salient to a sense of sarcasm. In this study participants again read target sentences embedded within a discourse context in which the target was a negative comment expressed indirectly through sarcasm or as a direct

criticism. Of most importance, participants were asked to consider the statements from a specific perspective: either as the person who uttered the negative comment, as the target of the barb or as a neutral over-hearer. A fourth group was not given any perspective information. Each participant rated the target comment along a set of dimensions chosen to tap speaker intent and impact.

The relevant results of Toplak and Katz is that, relative to a direct criticism, the "person who utters an indirect, sarcastic statement is perceived as intending to be more offensive, verbally aggressive, anger-provoking, and mocking. The sarcastic message is also perceived as more insincere, humorous, impolite, non-instructional, and conveying a somewhat unclear message" (pp. 1470-71). Basically, sarcasm was perceived as a means of verbal aggression. There was an interesting difference amongst those who took on the varying perspectives of speaker, recipient or over-hearer of the barb. Inasmuch as the speaker perceived his/her comments more positively than people with differing perspectives. The speaker felt relatively less negative and aggressive, while people taking other viewpoints saw them more so.

Despite the differences noted above, there were no systematic differences in the type of intentions perceived by speaker and victim. Both groups saw sarcasm as a more negative form of criticism than when it is expressed directly, and both groups showed the same overall profile of intentions as being involved. The difference was, as noted above, the speaker perceived less overall negativity in the comment than did the victim.

In summary, the theories reviewed here would argue that a sense of sarcastic irony to a statement involves a discourse context or environment that possesses all or

some of the following: a sense of (or allusion to) failed expectation, pragmatic insincerity, negative tension and presence of a victim.

Empirical Investigations of the Necessary Components of Sarcastic Irony

To our knowledge, there is only one study that has focused on identifying the necessary components of sarcastic verbal irony mentioned above, namely a paper by Herbert Colston (2000). Colston investigated two necessary conditions for verbal irony that were proposed by theories of verbal irony comprehension (e.g. Kumon-Nakamura et al., 1995; Kreuz & Glucksberg, 1989). The two necessary conditions were *allusion to violated expectations* and *pragmatic insincerity*. In his article, Colston (2000) experimentally investigated the necessity of these two conditions in sarcastic verbal irony.

The first condition, *allusion to violated expectations*, as mentioned earlier, refers to the concept that the speaker of the sarcastic verbal irony must in their comment refer to a prior prediction, expectation, preference, previously made comment or social norm that during the ensuing events was violated. The mechanisms for achieving an allusion to violated expectations in verbal irony are echoic mention, echoic reminder, elicitation, true assertion and pretense. All of these examples have the common characteristic of illuminating some expectation, desire, social norm etc. that was not achieved. As a result Kuman-Nakamura et al. (1995) used the broad term *allusional pretense* to describe all of these violated expectations (Coslton, 2000).

The first set of studies done by Colston (2000) investigated the necessity of the condition: *allusion to violated expectations*. In the first study participants were given

20 different scenarios and asked to rate how sarcastic the speaker was being with his or her comments. The scale ranged from 1 (not at all sarcastic) to 7 (extremely sarcastic). Colston judiciously manipulated the content of these scenarios such that they differed on the nature of the critical "sarcastic" comment (i.e., earnest negative, echoic, negative jest, and earnest positive). Examples of each comment type as taken from Colston (2000, pp. 287) follow:

Earnest negative – *You and Julie want to go to a concert but neither of you have enough money for the ticket. She says* "This sucks."

Echoic – *You and Julie want to go to concert but neither of you have enough money for the ticket. She says,* "This is great."

Negative Jest – *You and Julie want to go to a concert and you both have enough money for the ticket. She says,* "This sucks."

Earnest Positive – *You and Julie want to go to a concert and you both have enough money for the ticket. She says,* "This is great."

The main experimental question in the first set of studies by Colston (2000) was to see if the ironic interpretation of negative jest involves the interpreter of the comment to infer a violated negative expectation.

Through the sarcasm ratings of the participants, Colston (2000) found that the negative jest scenarios were rated almost as sarcastic as the echoic scenarios (means of 5.11 and 5.62 respectively). It was presumed by Colston that the interpretation of verbal irony relies upon some allusion to failed expectations. When one gives positive assertions about negative situations this achieves an allusion to failed expectation by echoing commonly recognized social norms (Colston, 2000). Colston

claims that this is why echoic comments would be rated as more sarcastic than the earnest comments. Colston, basing his predictions upon the findings of Kruez and Glucksberg (1989), predicted that the negative jests would be rated as sarcastic but not to the level of the echoic comments. However, both the negative jest and the echoic comments were expected to be rated as more sarcastic than the earnest comments. Colston's findings supported this prediction.

Once it was established that the negative jest scenarios were seen as sarcastic by the participants, Colston (2000) set out to experimentally test to see if the negative jest scenarios were seen to include an allusion to violated expectations. Colston (2000) did so by using the same scenarios as the previous study. However, instead of asking participants to rate the level of sarcasm, they were asked to rate the degree to which each speaker expected the situation that they encountered.

The logic behind this being that, according to Colston (2000), if the interpreter does not infer some level of failed expectations, then the previous claim that sarcastic verbal irony has a necessary condition of allusion to violated expectations would need revision. In other words, according to Colston, if a listener is able to successfully interpret sarcastic verbal irony in an utterance without detecting an allusion to failed expectation within the surrounding environment, then the allusion to failed expectation claim being necessary for such interpretations would have to be revisited.

The findings from the rating of expectedness did however reveal that the speakers were in fact surprised by the events in the scenarios (Colston, 2000). In other words, the ratings supported the notion that the speaker was not expecting the events that occurred in the scenarios. This result, combined with the finding that the

negative jest (and echoic) scenarios were also rated as sarcastic, supports the proposition that allusion to violated expectations is a necessary condition in sarcastic verbal irony comprehension according to Colston (2000).

The second condition investigated by Colston (2000) was *pragmatic insincerity.* Kumon-Namamura et al. (1995) developed the term pragmatic insincerity to account for utterances that do not appear insincere on a propositional level, but do seem to be insincere on a speech act level. In other words, the utterance is spoken as and presented as if it is a sincere comment, however it is intended as an insincere comment and the speaker is not making a truthful statement. In the second set of experiments by Colston (2000), he investigated this condition of pragmatic insincerity by testing to see if pragmatically *sincere* comments would be interpreted sarcastically. Colston asked participants to rate the degree of sarcasm they perceived in *pragmatically insincere*, *pragmatically sincere*, and *earnest comments* within 16 scenarios. The idea behind this study was that if participants only rated the pragmatically insincere comments as sarcastic, it would support the proposal of pragmatic insincerity as being a necessary condition of sarcastic verbal irony. However, if participants rated the pragmatically sincere items as sarcastic, then this would not support that notion (Colston, 2000). The following are examples of each type of item used; taken from Colston, 2000, pp. 117:

Item Examples:

Pragmatic Insincere: Margaret was a very prim and proper person and she appreciated good table manners. You and she were having lunch once, when a man

at an adjacent table let out a very loud belch. Margaret said to the man, *"I love when people belch at the table."*

Pragmatic Sincere: Margaret was a very prim and proper person and she appreciated good table manners. You and she were having lunch once, when a man at an adjacent table let out a very loud belch. Margaret said to the man, *"I love when people don't belch at the table."*

Earnest: Margaret was a very prim and proper person and she appreciated good table manners. You and she were having lunch once, when a man at an adjacent table let out a very loud belch. Margaret said to the man, *"I hate when people belch at the table."*

Colston found no significant difference in the level of rated sarcasm between the rating of the pragmatically insincere items and the pragmatically sincere items. In other words, the items in which the speaker was making a truthful statement at the propositional level (*I love when people don't belch at the table)* were rated just as sarcastic as the items in which the speaker was giving an insincere statement (*I love when people belch at the table).* This result indicates, according to Colston (2000), that the condition of pragmatic insincerity may not actually be necessary for the successful comprehension of sarcastic verbal irony.

Summary

The major purpose of the preceding section was to give an overview of the proposed necessary conditions that lead to comprehension of sarcastic verbal irony. In reviewing the theories, four conditions have been identified*; negative tension, allusion to failed expectations, pragmatic insincerity,* and *presence of a victim.*

Current Research

The goal of the studies conducted and proposed to be conducted is to further the investigation of the necessary conditions for the successful comprehension of a sarcastic/ironic utterance and their impact on the processing of sarcastic utterances. One of the ways that this investigation into the topic will differ from those of the past is the experimental task utilized in the main study. In previous research investigating verbal sarcastic/ironic statements, items were created, presented in reading tasks in which participants then rated level of sarcasm or some other dependent variable (e.g. Colston, 2000; Kumon-Nakamura, Glucksberg & Brown, 1995). In other words, the context and the target statements embedded within those contexts were created and developed by the researchers beforehand.

One of the goals of this research is to present a task that enables the participants themselves to come up with the contextual components necessary to convey verbal sarcasm/irony. This novel task allows participants the freedom to put into a generated context what they see as sufficient and necessary characteristics to convey an understandable sarcastic utterance. In other words, the task used in the first study of this research will not be restricted by the researchers predetermining the sarcastic contexts, but rather give participants the opportunity to include the contextual conditions they would deem must be present to understand an utterance as being sarcastic. These generated contexts will then be investigated in subsequent studies presented here by subjective ratings, and objective analysis of the lexical items. Finally, a subset will be employed in an online reading task. The aims are twofold. The first will be to test which, if any putative components are necessary for creating a

sense of sarcastic irony, and second to test whether specific theoretical proposals can be supported.

CHAPTER TWO: EMPERICALLY IDENTIFYING THE COMPONENTS OF GENERATED CONTEXTS

Traditionally, research investigating sarcastic verbal irony has consisted of providing participants with pre-written and controlled texts - controlled in the sense that researchers manipulate the presence or absence of certain features they deem important. These techniques have proven useful in examining selected theoretical questions. However, the use of pre-determined text also presupposes that these texts contain the characteristics of sarcastic irony without subjecting that presupposition to empirical testing. In the novel task used here, participants are asked to generate a discourse context that they believe would lead to a sarcastic reading. From the perspective taken here, these generated contexts can be analyzed to see what components are actually used to signal sarcastic irony and to answer the following question: Are there features added to context that invite a sarcastic interpretation? Are any such features necessary to create that sense of sarcasm?

The data generation steps employed here are as follows. The first step to develop this task is to gather a set of target utterances that one can subsequently use in a context generation task. In this step the aim is to identify items that, out-of context, would be either unlikely to be seen as sarcastic or conversely, be commonly read as sarcastic. Once a set of appropriate items are identified, the next step will be to include the items in a context generation task. The results of the context generation task will then be analyzed to determine if participants include in their generated

contexts the components of discourse context deemed to be necessary by the existing and previously defined theories. More specifically, the components are allusion to failed expectation; pragmatic insincerity; negative tension; and the presence of a victim. The contexts created will be analyzed using both subjective (coded and rating measures) as well as objective (Linguistic Inquiry Word Count) measures to determine if the sarcastic contexts created differ from the literal contexts that are created.

Creating a set of target items for use in the context generation task

To examine the effect of context on the level of sarcastic verbal irony, one requires a set of items for out-of-context occurrence that is perceived as neither conventionally sarcastic nor non-sarcastic when used as a sarcastic utterance. That is, the ideal situation would be for the target sentences to fall in the mid-range of a conventionality sarcasm-rating scale and could, thus, be biased towards a literal or ironic use by the nature of the discourse context. Consequently, a set of items were rated on an 8 point scale in which a score of 0 referred to *not conventionally used sarcastically at all* and a score of 7 referred to the item being *highly conventionally used sarcastically*. A second rating was also included: *Ease of context creation*. The logic for this rating is that if an item is perceived as being too easily put into context it could be a result of being too strongly associated with a particular sarcastic context (which could be considered as akin to highly conventional). If an item was consistently rated as *very difficult* to place into context, it could be argued that the item is confusing or too difficult to associate with any sarcastic meaning or context.

Participants

Eighty-two participants were tested; (45 females); the average age of the complete sample is 20 years. The participants were undergraduate students enrolled in an Introductory Psychology course at the University of Western Ontario. The students received one half-credit (30 minutes) towards their course requirements for their participation.

Rating Scales, Instructions and Procedure

A set of items were rated on an 8 point scale measuring the degree to which an item is conventionally understood as sarcastic when out-of-context. A score of 7 represents an item that is highly sarcastic and 1 as not sarcastic at all. Because of the nature of the main task, a second rating, *ease of constructing a context*, was also measured. The *ease of constructing a context* measure was to measure how difficult or easy it would be to generate a surrounding context that would allow for the listener to know the comment was meant as a sarcastic utterance.

Target sentences were collected from previous studies investigating verbal irony (Colston, 2000; Katz & Pexman, 1997). Examples of these target items are *"I did great on that test."* and *"You are in a good mood today."* Twenty-five of these target items, as well as 10 filler items, were rated using the two scales described above (conventionally

used as sarcasm, and ease of creating context). The following is an example of the instructions given:

Your task is to rate the statements in bold italics on the two scales provided. The first scale is a rating of how often (conventional) the statement is used with a sarcastic meaning (stating the opposite of what the speaker intends). The second scale is a measure of how easy it is for you to think of a context or scenario in which the statement could be used in a sarcastic manner.

"I did great on that test."

How often is this statement used with a sarcastic intention?

Never Always

0 1 2 3 4 5 6 7

How easily can you come up with context to make this statement sarcastic?

Very Easy Very Difficult

0 1 2 3 4 5 6 7

Participants signed up and completed the study online. They were presented the target sentences with the two rating scales one at a time. Participants worked at their own pace and, on average, it took approximately 25 minutes to complete the task.

Results

On the 8-point scales, the average conventionality of sarcasm use ranged from 3.6 to 4.3 and on the ease of constructing a sarcasm context scale from 2.8 to 3.4. The average ratings did not differ from the mid-point (3.5) of the respective scales, $t(81) = 0.088$, and $t(81) = 0.352$, both $ps > 0.05$ for the sarcasm and ease of constructing a context. Because the items were at the mid-range of both scales, it was deemed that the items were neither at ceiling nor basement and hence that the effects of inviting a sarcastic context could be appropriately studied using this item set.

Experiment 1: Context generation under two instructional sets

The 25 items described above were placed in minimal context, and participants were asked to construct a more elaborate context making the target sentence be understood simply as "meaningful" (the Open control condition) or as "sarcastic" (the Experimental condition). The aim was to see whether the instructional manipulations led to differences in the nature of the contexts that were produced. In essence, the aim here was to empirically determine the contextual characteristics that our participants generated distinguishing sarcastic from non-sarcastic sentences. Analysis of the control condition will indicate whether some sentences will be used as sarcasm, even though previously rated as mid-line conventional in sarcastic usage, and even when participants are not instructed to do so.

Methods

Participants

Eighty-four undergraduate students (54 Females and 30 Males) from the University of Western Ontario were tested and given 1 credit for their participation;

the mean age of the complete sample is 21 years. There were forty-two participants in each of the two groups (sarcastic instruction and open instruction).

Materials and Procedure

In this study participants were provided, in booklet form, a set of target sentences. Along with each target sentence presented, there was given a minimal context. An example of a booklet item looked like this:

_____

Stan and Jennifer had just finished the exam.

_____

Jennifer turns to Stan and says,

"I did great on that test."

In this example, the target statement is "I did great on that test." and the participants were asked to create the necessary context to ensure that the statement was understood.

The following are the instructions given to participants from the two groups:

A) Open Instruction Group

In each of the following stories a person says something. Some minimal context is provided for the conditions or situation in which the statement was made. Your task is to ADD information to the context so that a naïve reader would understand exactly why the statement (in italics) was made. For each of the stories we have added some blank lines. ADD information to any of these blank lines that you think would make the target statement completely understandable.

B) Sarcastic Instruction Group

In each of the following stories a person says something that was meant to be sarcastic. Some minimal context is provided for the conditions or situation in which the statement was made. Your task is to ADD information to the context so that a naïve reader would understand exactly why the statement (in italics) was sarcastically made. For each of the stories we have added some blank lines. ADD information to any of these blank lines that you think would make the target statement completely understandable as a sarcastic comment.

Each booklet contained 25 items (the list is provided in Appendix A).

The study took approximately 45 minutes to complete.

Results

Given that there were 25 items and 42 participants per instructional set, over 1000 contexts were generated for each set. These items were coded for speaker intent as follows. A coder, blind to the instructional manipulation, was employed to rate each item. For the initial round of coding the coder was instructed to read each item (context plus target sentence) and for each of the items determine if the target sentence was intended as literal or sarcastic (a binary decision). The few items that were seen as ambiguous by the rater (i.e. neither literal nor sarcastic) were categorized as "other". To ensure the reliability of this categorization, a second blind coder was given 15 booklets (375 generated contexts) from each of the groups to code, with the same instructions as the initial coder. Almost 95% (94.3%) were placed in the same categories by the two coders. To reiterate, the coders were not informed about the instructions given to the participants (sarcastic or open) and were not told about the goal of the study. Given the high rate of concordance, the data from the first coder is employed and is depicted in Table 1.

Table 1

Percentage of Items from both Instruction Groups (Open Instruction and Sarcastic Instruction) Classified into Each Category (Sarcastic; Literal; Other)

	Sarcastic	Literal	Other
Open Instruction	10	83	7
Sarcastic Instruction	98	1	1

As can be seen, the contexts that were produced differed under the two types of instructions provided. One instruction group asked the participants to create "meaningful" contexts, while the other group asked for contexts that created sarcastic utterances. It is also of interest that 10% of the items created in the open instruction group turned out to be sarcastic, despite not being specifically asked to produce a sarcastic context. Recall as well that the items were in the mid-range of the conventionality of sarcasm and ease of constructing a sarcastic context ratings, when measured out-of-context. Despite not being rated as a conventionally sarcastic statement (in isolation), some participants still chose to generate a context to support a sarcastic meaning despite not being prompted to do so. We will discuss an implication of this finding in the Discussion section.

Given that the instructional manipulation was effective in discriminating sarcastic from non-sarcastic use of an utterance, the items were examined further to determine correlates of this difference. The next set of analyses examined characteristics that the participants put into the discourse context to invite a sarcastic (from a non-sarcastic) reading of a given item. Both subjective and objective indices were taken. The following section will review the objective measure and the associated results.

Do sarcastic and non-sarcastic contexts differ at the lexical level?

The objective measure used for this analysis is a software program called the Linguistic Inquiry and Word Count (Pennebaker, Francis & Booth, 2001). The LIWC software analysis provides an objective measure of linguistic characteristics for comparison between the contexts generated by the two instruction groups (sarcastic vs. open).

The LIWC analyzes samples of text on a word-by-word basis and compares each word to a dictionary divided into 74 categories. Some of these categories are linguistic in nature, such as identifying the frequency with which articles such as "a" or "the" are employed. Other categories are based on normative ratings by a set of judges; examples of this type of category would be "negative emotion words" or refer to specific mental states such as being "tentative" (indexed by words such as "perhaps") or refer to social processes, such as those indicating friendship relationships (indexed by words such as "buddy" or "pal"). Although an admittedly crude instrument, the LIWC nonetheless has proven it can identify cases where people are lying (e.g. Newman, Pennebaker, Berry, & Richards, 2003) or of gendered language differences in usage by men and women (Newman, Groom, Handelman, & Pennebaker, 2008) among other findings.

The authors of the LIWC have argued that the word count "… fails to appreciate sarcasm or irony" (Newman et al., 2008, p.217). Although admittedly crude and recognizing that subtle uses of non-literal language especially might be miscategorized by the LIWC algorithm, we believe that the efficacy of the LIWC should not be discounted as a means of identifying contextual differences, especially in a situation such

as we find here, where the contexts have been generated to explicitly display sarcasm. Thus, the aim here is to see whether some of the effects found between generated contexts that invite sarcasm and those that do not can be attributed to the specific stylistic choices employed in creating the relevant contexts.

To meet these aims, the generated contexts – at approximately two thousand - that were collected above were input into the L.I.W.C. 2007 program and analyzed to determine whether the contexts that produced sarcasm differed in the type of language employed from contexts that did not produce sarcasm. The items that successfully conveyed sarcasm were taken from the sarcastic instruction group and contrasted with the items from the open instruction group that were seen as literal in meaning. The output of the program is the percentage of words found in each of the 74 categories per total number of words in the text file.

Despite the claim that the LIWC was incapable of identifying sarcasm, reliable differences between the two groups were found in 31 of the categories. Because of the fact we were examining minimal contexts and thus might make salient spurious differences, we report here statistical differences only for those categories in which at least 3% of the total words fell into one of the two groups. The categories that met this criterion are displayed in tables 2 and 3. As can be seen, the contexts that invited a sarcastic reading differed from those that did not. They differed in terms of linguistic variables and based on judged characteristics.

Table 2

Means (in percentage) of the Significant Factors Between Sarcastic and Open Instruction Groups, for the Linguistic Processes Scale

Linguistic Processes Scale		**Group**		
Factor	Examples	Sarcastic	Open	*F*
Negations	No, not, never	4.17	1.33	39.83**
Present Tense	Is, does, hear	6.92	4.70	7.54*
Personal Pronouns	I, them, her	5.47	7.23	6.24*
Auxiliary Verbs	Am, will, have	11.72	9.83	5.88*
3rd Person Sing.	She, her, him	3.02	4.79	5.74*
Past Tense	Went, ran, had	8.76	10.49	5.42*
Articles	A, an, the	9.07	8.03	5.02*
Pronouns	I, them, itself	8.30	10.34	4.83*
Prepositions	To, with	9.26	10.93	4.76*

** indicates significant at .05 level; ** indicates significant at the .01 level*

Table 3

Means (in percentage) of the Significant Factors Between Sarcastic and Open Instruction Groups, for the L.I.W.C Psychological Processes Scale and the Personal Concerns Scale.

Psychological Processes Scale		Group		
Factors	Examples	Sarcastic	Open	*F*
Negative Emotions	Hurt, ugly, nasty	4.88	1.22	91.07**
Positive Emotions	Love, nice, sweet	3.56	6.44	32.70**
Exclusive	But, without, exclude	3.35	1.39	23.49**
Social	Mate, talk, they, child	9.84	12.07	12.59*
Perceptual Processes	Observing, heard, feeling	2.48	3.34	8.06*
Relativity	Area, bend, exit, stop	12.54	14.63	5.97*

** indicates significant at .05 level; ** indicates significant at the .01 level*

Although not directly tied to the putative necessary characteristics proposed by different theorists, several aspects of these data are intriguing. First, the sarcastic inviting contexts contain more negations, more negative emotions and fewer positive emotions than the non-sarcastic contexts. On face, this is consistent with the notion that negative tension is important in creating an ironic environment. Second, the sarcastic contexts contained more instances of present tense, and fewer of past tense, then the non-sarcastic contexts. These data might suggest that relative to non-sarcastic contexts, the sarcastic contexts are more immediate or more frequently involve the activation of event structures that are being simulated as ongoing (see for instance, Ferretti & Katz, 2009, for examinations of event structures, verb aspect and autobiographical memories). Finally, one can speculate that the higher frequency of exclusion terms in the sarcastic contexts are an index of failed expectations. Naturally, one can only speculate on the reasons for the differences we observe here and studies designed to test alternative explanations are required. Regardless, the presence of so many differences in what are, after all, minimal contexts points to the presence of stylistic differences in the discourse associated with creating a sense of sarcasm.

Overall, the key finding related to this investigation is that the participants who generated the sarcastic contexts used different words to support the target utterance and that on face, some of these lexical differences were consistent with theoretical

explanations as to how sarcastic and non-sarcastic contexts differ from one another. In the next section we address these theoretical contextual differences directly, by examination of participant ratings.

Subjective Ratings

The same two coders as used before were employed again. This time the task of the coders was to classify the generated contexts for; a*llusion to failed expectations*, *pragmatic insincerity, negative tension and presence of a victim*. The coders were given the definitions of each concept, as used in the extant literature, and asked to indicate for each concept whether or not in their opinion an item possessed the concept being considered. There was agreement on classification by the two coders on 99% of the items.

As predicted by these theories, the contexts generated under the sarcastic instructions were more likely to exhibit an *allusion to failed expectations* (M = 24.28; $S.D.$ = 1.01 vs. M = 1.64; $S.D.$ = 2.03 in the open instruction group; $t(82) = 63.286$; $p <$ 0.01.), *pragmatic insincerity* (M = 22.6; $S.D.$ = 1.34 vs. M = 0.88; $S.D.$ = 1.47; $t(82) =$ 71.302); the *presence of negative tension* (M = 23.4; $S.D.$ = 0.85 vs. M = 2.49; $S.D.$ = 3.89; $t(82) = 34.932$; $p < 0.01$) and the *presence of a victim* (M = 20.47; $S.D.$ = 0.85 vs. (M = 1.79; $S.D.$ = 1.44); $t(82) = 72.987$, $p < 0.01$. The means here refer to the number of items on average per 25 items that contain that contextual component generated by each participant. For example, of the 25 generated items in the sarcastic instruction group per participant, 24.28 on average were rated as containing an allusion to failed expectations

whereas only an average of 1.64 of the generated items out of 25 for the open instruction group contained an allusion to failed expectations.

Discussion

The findings from the above experiment show that the target sentences, when presented in isolation, were not seen as being conventionally sarcastic in nature. These same target sentences however, when surrounded by contextual information provided by the participants asked to create a sarcastic context, were later coded as being sarcastic by a naïve rater. Our aim was to have items that were not too conventional one way or the other (sarcastic or literal) with the hope that accompanying contextual information could push the meaning to be either sarcastic or literal. The findings indicate that our goal was achieved.

The findings from the context generation task showed that the contexts created by the two instruction groups differed significantly in both objective and subjective measures. The objective measure showed that the participants used different types of words in the creation of the contexts dependent on whether the goal was to achieve sarcasm or just to make a meaningful statement. The findings from the subjective coding showed that the components proposed by the models of sarcasm covered earlier are often found in the contexts created. In other words, the subjective coding found that the proposed necessary components are often present in the contextual information that was generated by the participants. The logical next step

then is to see if these components that are often present in sarcastic contexts are actually necessary for the successful interpretation of a sarcastic utterance, and data to this end will be presented in the upcoming chapter.

The differences found thus far have demonstrated that sarcastic contexts and literal contexts differ in the components used to sway the meaning towards either the sarcastic or the literal. The findings also demonstrate that participants are able to successfully create contextual information that conveys sarcastic meaning. This is an important finding because it allows us to employ the more empirical context generation task rather than providing participants with pre-written contextual items. The following chapter will investigate whether the components proposed by the different models are indeed necessary to successfully convey sarcastic meaning.

CHAPTER THREE: IDENTIFYING WHETHER THERE ARE NECESSARY CONDITIONS FOR SARCASM

In the earlier sections we have demonstrated that items that out-of-context are not rated as sarcastic can be seen as such when placed in a context generated by participants to make the items understood as being intentionally sarcastic (relative to a comparison group). We have also demonstrated that the generated contexts differ at the lexical level, at least by coders using a binary classification system in terms of perceived levels of violated expectation, negative tension, pragmatic insincerity and presence of a victim. In this chapter we will again analyze the generated contexts, but now subject the contexts to ratings by a large sample of naïve raters along the Likert-scale dimensions. The data so provided permits for an examination of the inter-relations amongst the putative necessary conditions proposed in different theories, and whether which, if any, of the theoretical components are in fact necessary in producing a sense of sarcasm. This section will pose two questions. First, do the factors suggested by different theories independently predict level of sarcasm? Second, which, if any, of the suggested factors are necessary for producing a sense of sarcasm? Once again, the five scales employed earlier are used: *level of sarcasm*; *presence of a victim*; *allusion to failed expectation*; *negative tension* and *pragmatic sincerity.*

Do the factors suggested by different theories independently predict level of sarcasm?

Participants

Eighty-two participants were tested (46 females: with a mean age of 19 years old). The participants were undergraduate students at the University of Western Ontario who participated as a requirement for Introductory Psychology and who received one research credit for their participation.

Materials

The contexts generated in the context completion task were presented to the participants in booklet form. Each of the generated contexts and target sentences were supplemented by the five rating scales used by the coders: *level of sarcasm*; *presence of a victim*; *negative tension*; *allusion to failed expectations* and *pragmatic sincerity*.

Each participant rated one of the booklets created during the context completion task described in Chapter Two. Along with the booklets of items, the participants in this study were given 25 pages of blank ratings to fill out. The ratings were eight point scales ranging from 0-7. The five ratings used were based upon the characteristics coded for earlier: *level of sarcasm*; *presence of a victim*; *negative tension*; *allusion to failed expectations* and *pragmatic insincerity*. Each participant received a booklet containing 25 items. The task took approximately 45 minutes to complete.

Participants were given the same definitions for each of the scale terms as those given to the coders. Examples of the scales are depicted below:

Level of Sarcasm

Not at all Extremely

0 1 2 3 4 5 6 7

Presence of a Victim

Not at all Clearly

0 1 2 3 4 5 6 7

Negative Tension

Not at all Extremely

0 1 2 3 4 5 6 7

Allusion to Failed Expectations

Not at all Clearly

0 1 2 3 4 5 6 7

Pragmatic Insincerity

Not at all Clearly

0 1 2 3 4 5 6 7

Results and Discussion

The mean ratings for the sarcastic and open instruction groups and summary ANOVA statistics for each scale are shown in Table 4.

Table 4

ANOVA results showing Rating level means, F values and significance levels

	Sarcasm Instruction		Open Instruction			
Factor	M	SD	M	SD	F	Sig.
Level of Sarcasm	6.05	.83	1.82	.63	204.21	.01
Presence of Victim	4.26	.74	1.37	.41	121.11	.01
Negative Tension	4.53	1.18	1.53	.24	99.18	.01
Failed Expectation	4.65	.92	1.43	.18	101.89	.01
Pragmatic Insincerity	5.33	1.32	2.04	.79	111.07	.01

The data acquired in this section is comparable to the findings in the earlier coding section (see chapter two), however these findings are from a much larger sample (82 participants vs. 2 independent raters) and come from a more fine-grained measure (8-point scales vs. dichotomous categorization). That is, we found that the proposed conditions are generally present in the sarcastic items and that the contexts created in the sarcastic instruction group differed from those created in the open instruction group. The data collected here allows for an examination of the inter-relations amongst the scales. Table 5 depicts the relation between variability in *rating of level of sarcasm* with the four other measures employed here. As can be seen, variations in degree of sarcasm is correlated moderately with each of the measured dimensions, ranging from $r = .637$ (pragmatic insincerity) to $r = .784$ (negative tension). The conditions also correlate with each other (shown in Table 5), ranging from a moderate correlation ($r = .452$ for Presence of a Victim and Pragmatic Insincerity) to a strong correlation ($r = .759$ for Negative Tension and Failed Expectation).

Table 5

Pearson Correlation Matrix for Sarcasm Ratings and Identified Components

	Victim	Pragmatic Insincerity	Negative Tension	Failed Expectation	Sarcasm Level
Victim	1.000	.452*	.637*	.590*	.727*
Pragmatic Insincerity		1.000	.520*	.499*	.637*
Negative Tension			1.000	.759*	.784*
Failed Expectation				1.000	.769*

*$p < 0.01$ (2-tailed)

A stepwise regression analysis was conducted in which the four key components (Negative Tension; Failed Expectation; Pragmatic Insincerity; and Presence of a Victim) were used to predict the level of Sarcasm. The step-wise regression analysis was significant; $F(4, 1941) = 1753.7$ $p < .001$; $R = .88$, $R^2 = .78$. Table 6 shows the standardized coefficients partial correlations and significance tests.

Table 6

Summary of stepwise regression analysis on Sarcasm using the other key components as predictors.

Independent Variable	*R*	*R-square*	*β*	*t* value	Significant Change in Sarcasm Level; $p <$
Negative Tension	.784a	.614	.267	15.13	.01
Victim	.837b	.701	.287	20,23	.01
Pragmatic Insincerity	.865c	.749	.226	17.77	.01
Failed Expectations	.884d	.781	.284	16.94	.01

a. Predictors: (Constant), Negative Tension

b. Predictors: (Constant), Negative Tension, Victim

c. Predictors: (Constant), Negative Tension, Victim, Pragmatic Insincerity

d. Predictors: (Constant), Negative Tension, Victim, Pragmatic Insincerity, Failed Expectations

Based on the results of the regression, it is apparent that each of the four targeted conditions (*allusion to failed expectations, pragmatic insincerity, negative tension and presence of a victim*) independently predicts level of sarcasm. This finding supports the claim that each of the factors assumed by one or another of the theories regarding conditions necessary for sarcasm contributes independent predictability to ratings of sarcasm. As such, the regression analysis supports the claims put forth by both the allusional pretense model and the implicit display model that the sense of sarcastic verbal irony is directly predicted by the presence *allusion to failed expectations*; *negative tension*; and *pragmatic insincerity*. It also supports the argument that a factor in addition to those described in those theories is the presence of a victim. These findings confirm that the presence or allusion to each of these factors is sufficient contributors to a sense of sarcasm. These data do not indicate, however, whether each of these conditions is necessary to produce a sense of sarcasm. The question of necessity is addressed in the next section.

What Factors are *Necessary* for Producing a Sense of Sarcasm?

In the following section, the ratings collected using the 8-point sarcasm scales will be analyzed in order to directly evaluate the predictions inferred by the major theories related to sarcastic verbal irony covered previously (*Implicit Display Model*; *Allusional Pretense Model; and Presence of a Victim*). Each of the characteristics will be examined in turn to see whether or not they are deemed as necessary to

creating a sense of sarcasm. The logic of these analyses is that sarcasm should be most apparent (or only apparent) when each of the necessary conditions posited by an extant theory is met. Because failed expectation is a component of each theoretical position, it will always be a factor in the analyses below. Orthogonal to the failed expectation factor will be a unique contribution of the other proposed factors, namely negative tension, pragmatic insincerity and presence of a victim respectively. As an example, to support the implicit display model both an allusion to failed expectations and negative tension would be required to produce an ironic environment that leads to a sense of sarcastic irony (Utsumi, 2000). For other theories, different components would be involved.

The following section will review analysis done to test each of the theories separately, looking at the key conditions related to each model and measuring them against level of sarcasm. The data for each comparison will be presented as follows: we will take each item generated in the context generation task and categorize them according to how they were rated in the rating task. All items that were rated as 5 or higher on the scales used in the rating task will be placed into a "high" category and all items that were rated as 3 or lower on each scale will be put into a "low" category. For example, an item that was rated as 6 on the negative tension scale will be placed within the High negative tension group. An item that was rated as 2 on the pragmatic insincerity scale will be placed in the Low insincerity group. By separating the items into these high and low categories it will allow us to directly test if having low or high levels of the key components changes the level of sarcasm associated with each item.

Due to the fact that each theory covered in this paper has the condition of *allusion to failed expectation* as part of the associated model, we have included that condition in each analysis. Along with allusion to failed expectation, the additional key condition will be categorized into high and low for each model. For example, *negative tension* will be included along with *allusion to failed expectation* for measuring the implicit display model. Also included in the analysis will be the type of instruction variable (open vs. sarcastic). This will create for each analysis a 2 (high/low failed expectation) X 2 (high/low on a unique characteristic, such as negative tension) X 2 (items generated under sarcasm or open conditions) structure. The sarcasm ratings given each item will be employed as the dependent variables in an ANOVA.

The logic here is simple and analogous for those employed in studies examining whether there are necessary features of concepts (e.g., Hampton, 1995): If conditions deemed necessary are in fact necessary, then those items rated at the top of the 7-point sarcasm scale would fall into the high-high group. It would not be expected, for example, to have items rated as high as possible on the rating of sarcasm to fall into any low group, and especially not into a low-low group (e.g., low failed expectation-low negative tension group). The next sections will separately test each of the three theories covered in this paper; the implicit display model; allusional pretense model; and presence of a victim.

Direct Analysis of Ratings for Implicit Display Model

In this section a more direct comparison will be made between the ratings collected and predictions put forth by the model of implicit display. Recall that the two specific necessary conditions put forth by the implicit display model were an

allusion to failed expectations and negative tension (Utsumi, 2000). In order to measure the predictions of this theory, all of the sarcastic instruction items were separated into categories related to the ratings received on the conditions of allusion to failed expectation and negative tension.

A 2 X 2 X 2 ANOVA was conducted to evaluate the impact of negative tension and allusion to failed expectations on the level of sarcasm found in the generated items from the two instruction groups (Sarcasm vs. Open). The conditions of negative tension and allusion to failed expectations were divided into two levels (high and low). Recall that the high level category is defined by ratings of 5, 6, or 7 and the low level category is defined by all items rated 3, 2, or 1, thereby creating the four *groups* being tested (High Negative Tension/High Failed Expectation; High Negative Tension/Low Failed Expectation; Low Negative Tension/High Failed Expectation; Low Negative Tension/Low Failed Expectation). The number of items that were allocated into each of the four categories and broken down into their corresponding level of sarcasm is presented in Table 7. The level of sarcasm means, standard deviations and number of items of each group taken from the sarcastic instruction items and the open instruction items can be found in Table 8.

Table 7

Frequency counts for Implicit Display category (Allusion to Failed Expectation and Negative Tension)

1 = always refers to failed expectation

2 = negative tension

	SARCASM LEVEL						
Implicit display	**7**	**6**	**5**	**4**	**3**	**2**	**1**
$H^1 – H^2$	281	139	40	10	4	2	1
$H^1 – L^2$	52	26	5	6	1	1	Ø
$L^1 – H^2$	53	31	15	8	2	9	Ø
$L^1 – L^2$	40	21	11	12	5	12	9

Table 8

Mean Sarcasm Rating, Standard Deviations and Number of item in each Group for the Implicit Display Model;

Sarcastic Instruction items

Group	M	SD	N
High Negative Tension High Failed Expectations	6.5	.81	474
High Negative Tension Low Failed Expectations	6.3	1.1	81
Low Negative Tension High Failed Expectations	6.1	1.3	103
Low Negative Tension Low Failed Expectations	4.4	2.7	131

Open Instruction items

Group	M	SD	N
High Negative Tension High Failed Expectations	5.96	1.70	90
High Negative Tension Low Failed Expectations	5.48	1.12	21
Low Negative Tension High Failed Expectations	4.31	2.22	29
Low Negative Tension Low Failed Expectations	0.9	1.6	786

The ANOVA showed a significant main effect for instruction type on sarcasm level $F(1, 1729) = 106.54$; $p < .01$. The main effect for allusion to failed expectation on sarcasm level was significant $F(1, 1729) = 227.89$; $p < .01$. There was also a main effect of negative tension on level of sarcasm $F(1, 1729) = 214.31$; $p < .01$. The interaction between allusion to failed expectations and negative tension was significant $F(1, 1729) = 72.96$; $p < .01$. The interaction between allusion to failed expectation, negative tension and instruction was significant $F(1, 1729) = 14.16$; $p < .01$.

Discussion

The finding that items which were rated as low in both of the necessary conditions proposed by the Implicit Display Model also showed a significantly lowered level of sarcasm ratings would be considered supportive of the predictions put forth by the Implicit Display Model. However, the findings from the groups that were rated as high in just one of the two conditions (while scoring low in the other) yet still showed high levels of sarcasm could bring into question whether or not both conditions are *necessary* for comprehension of a sarcastic utterance. More specifically, if these two conditions are both necessary for sarcastic comprehension, then a low rating in either condition should result in a significant drop in the conveyance of sarcastic meaning, regardless of whether or not the other condition is rated as high. The high frequency of items that have high ratings in both of the conditions proposed by the implicit display model supports the *likelihood* that these conditions will be present in a context supporting a sarcastic utterance, however the continued existence of a high level of sarcastic meaning when the level of one of

these conditions is low leads to a questioning of the *necessity* of the conditions proposed by the implicit display model in conveying sarcastic meaning.

Direct Measure of the Allusional Pretense Model

The next section will analyze the data in terms of how they relate to the predictions of the allusional pretense model. Recall that the allusional pretense model claims that the necessary components of a sarcastic utterance are an allusion to failed expectations and pragmatic insincerity. Once again the items were categorized into high and low groups. The resulting groups for this analysis were High Failed Expectations-High Insincerity; High Failed Expectations-Low Insincerity; Low Failed Expectations-High Insincerity; and Low Failed Expectations-Low Insincerity. Shown in Table 9 are the counts for items that were rated high and low for the two key components of the allusional pretense model and broken down by their associated level of sarcasm rating.

Table 9

Frequency counts for Allusional Pretense category (Allusion to Failed Expectation and Pragmatic Insincerity) 1 = refers to allusion to failed expectation

3 = pragmatic insincerity

Category	**7**	**6**	**5**	**4**	**3**	**2**	**1**
$H^1 - H^3$	286	133	46	8	4	2	Ø
$H^1 - L^3$	22	23	23	15	4	2	2
$L^1 - H^3$	87	35	15	8	1	5	6
$L^1 - L^3$	4	4	3	12	6	4	Ø

A 2 X 2 X 2 ANOVA was run to measure the impact of failed expectation; pragmatic insincerity and instruction on the level of sarcasm, in accordance with the predictions put forth by the allusional pretense model. Similar to the previous analysis the conditions have two levels (high and low), the difference being that in this analysis the conditions being tested are allusion to failed expectations and insincerity. Once again the factor of instructional group (Sarcasm vs. Open) is being measured. The ratings were divided into high and low using the same method as the previous analysis. The dependent variable is once again level of sarcasm. The means; standard deviations on level of sarcasm and the number of items for each group for the sarcasm instruction items and the open instruction items are displayed in Table 10.

Table 10

Level of Sarcasm Means, Standard Deviations and Number of item in each Group for the Allusion Pretense Model;

Sarcastic Instruction items

Group	M	SD	N
High Failed Expectations High Pragmatic Insincerity	6.46	.87	503
High Failed Expectations Low Pragmatic Insincerity	5.83	1.45	72
Low Failed Expectations High Pragmatic Insincerity	6.09	1.63	140
Low Failed Expectations Low Pragmatic Insincerity	3.13	2.54	63

Open Instruction items

Group	M	SD	N
High Failed Expectations High Pragmatic Insincerity	5.85	1.82	47
High Failed Expectations Low Pragmatic Insincerity	5.33	2.25	61
Low Failed Expectations High Pragmatic Insincerity	1.24	2.02	281
Low Failed Expectations Low Pragmatic Insincerity	0.8	1.63	366

There was a significant main effect for instruction type on sarcasm level

$F(1, 1525) = 321.04$; $p < .01$. The main effect for allusion to failed expectation on sarcasm level was significant $F(1, 1525) = 696.1$; $p < .01$. There was also a main effect of insincerity on level of sarcasm $F(1, 1525) = 96.69$; $p < .01$. The interaction between allusion to failed expectations and insincerity was significant $F(1, 1525) = 72.96$; $p < .01$. The interaction between failed expectation, insincerity and instruction was also significant, $F(1, 1525) = 27.56$; $p < .01$.

Discussion

Similar to the findings for the implicit display model, the finding that items which scored low in both of the necessary conditions proposed by the allusional pretense model also showed significantly lowered level of sarcasm ratings would be considered supportive of the predictions put forth by the allusional pretense model. However, once again the findings from the groups that were high in just one of the two conditions (while scoring low in the other) still showed high levels of sarcasm, bringing into question whether or not both conditions are *necessary* for comprehension of a sarcastic utterance. More specifically, if these two conditions are both necessary for sarcastic comprehension, then a low rating in either the allusion to failed expectation or pragmatic insincerity condition should result in a significant drop in the level of sarcastic meaning. Again, the high frequency of items that have high ratings in both of the conditions proposed by the allusional pretense model supports the *likelihood* that these conditions will be present in a context supporting a sarcastic utterance. However the continued existence of a high level of sarcastic

meaning when the level of one of these conditions is low leads to a questioning of the *necessity* of the conditions in producing sarcastic meaning, much like the findings for the implicit display model.

Direct Measure of Presence of a Victim

The final set of analysis for the direct measure of the theories deals with the presence of a victim. Recall that researchers (Lee & Katz, 1998) have identified that having a specific victim of ridicule is a distinguishing feature for sarcastic utterances. According to Lee & Katz (1998) it is this directed ridicule and the identified victim that differentiates sarcasm from verbal irony. Therefore this set of analysis focused on the presence of victim ratings along with the allusion to failed expectations. Shown in Table 11 are the counts for items that were rated high and low for the two key components and broken down by their associated level of sarcasm rating.

Table 11

Frequency counts for each category for each theory

1 = always refers to failed expectation

4 = presence of victim

Category	**7**	**6**	**5**	**4**	**3**	**2**	**1**
$H^1 - H^4$	247	128	32	8	1	Ø	Ø
$H^1 - L^4$	87	56	16	6	5	1	3
$L^1 - H^4$	75	29	8	2	2	2	Ø
$L^1 - L^4$	28	12	8	15	4	7	30

A 2 X 2 X 2 ANOVA was run to measure the impact of failed expectation; presence of a victim and instruction on the level of sarcasm. Similar to the previous analyses the conditions have two levels (high and low), the difference being that in this analysis the conditions being tested are allusion to failed expectations and presence of a victim. Once again the factor of instructional group (Sarcasm vs. Open) is being measured. The ratings were divided into high and low using the same method as the previous analysis. The resulting four groups for this analysis then are: High Failed Expectation/High Victim; High Failed Expectation/Low Victim; Low Failed Expectation/High Victim; and Low Failed Expectation/Low Victim. The dependent variable is once again level of sarcasm. The means; standard deviations on level of sarcasm and the number of items for each group for the sarcasm instruction items and the open instruction items are displayed in Table 12.

Table 12

Level of Sarcasm Means, Standard Deviations and Number of item for each Group;

Sarcastic Instruction items

Group	M	SD	N
High Failed Expectations High Presence of a Victim	6.47	.87	416
High Failed Expectations Low Presence of a Victim	6.14	1.45	174
Low Failed Expectations High Presence of a Victim	6.42	1.63	118
Low Failed Expectations Low Presence of a Victim	3.87	2.54	104

Open Instruction items

Group	M	SD	N
High Failed Expectations High Presence of a Victim	5.84	1.82	69
High Failed Expectations Low Presence of a Victim	3.95	2.25	41
Low Failed Expectations High Presence of a Victim	4.96	2.02	25
Low Failed Expectations Low Presence of a Victim	0.59	1.63	761

Discussion

Once again, the finding that items which scored low in both of the targeted conditions (allusion to failed expectation and presence of a victim) also showed significantly lowered level of sarcasm ratings and would be considered supportive of the predictions put forth by researchers claiming that allusion to failed expectations and presence of a victim are necessary components of sarcastic utterances. However, once again the findings from the groups that were high in just one of the two conditions (while scoring low in the other) showed high levels of sarcasm and this finding could bring into question whether or not both conditions are *necessary* for comprehension of a sarcastic utterance. Consistent with the previous two analyses, the high frequency of items that were given high ratings in both of the conditions proposed supports the *likelihood* that these conditions will be present in a context supporting a sarcastic utterance, however the continued existence of a high level of sarcastic meaning when the level of one of these conditions is low leads to a questioning of the *necessity* of the conditions in conveying sarcastic meaning.

Recall however, that researchers (e.g. Lee & Katz, 1998) have claimed that presence of a victim distinguishes sarcasm from verbal irony. Therefore it may be possible that the participants doing the rating task did not distinguish between sarcasm and verbal irony. As a result, items that were low in presence of a victim but high in allusion to failed expectations could be *ironic* items that were just treated as sarcastic and as a result rated highly on the sarcasm scale.

Another interesting finding comes from an overall comparison of the sarcastic instruction group ratings compared to the open group for all the key categories. The open instruction group obviously had much fewer items that were considered to be sarcastic, however even when not prompted to come up with a sarcastic context, the rating means for three of the categories showed a very similar pattern as the sarcastic instruction group. In other words, even without being prompted to develop a sarcastic context, individuals seemed to include some combination of the proposed conditions. The analysis once again found that when any *one* of those conditions (allusion to failed expectation or presence of a victim) is rated at a high level it will result in a highly rated sarcastic interpretation. When the conditions were all scored as low in the open group, the utterances were rated very low on level of sarcasm. This is likely due to the fact that the participants for those items were developing a literal context.

CHAPTER FOUR: GENERAL DISCUSSION OF FIRST SET OF STUDIES

The findings from the analyses described in chapters 2 and 3 are clear in that the contextual characteristics generated under sarcastic instruction items significantly differ from the characteristics generated under of the open instruction group.

Coding and subjective measures:

The coding results from the context completion task have demonstrated that participants consistently included the components proposed in the implicit display model. Recall that according to the implicit display model, two of the key components were negative tension (on the part of the speaker) and allusion to failed expectations. The coding results could also be seen as supportive of the allusional pretense model due to the high number of items containing an allusional to failed expectations and pragmatic insincerity. In addition, the coding results also showed support for the proposal that an allusion to failed expectations and the presence of a victim are consistently found in sarcastic context.

Results however from the larger subjective measure phase provide both supportive and potentially contrarian evidence to the proposal that these components are all necessary for the successful comprehension of a sarcastic utterance. The support can be found in the results showing that level of sarcasm was correlated reliably with each of the components proposed by the theories and coded for in the

experiment (presence of a victim, negative tension, allusion to failed expectation and pragmatic insincerity).

The result that can raise questions about the necessity of these components was the finding that items were sometimes rated both highly sarcastic and at the same time rated low (3 or less on the scale) on one of the other presumably necessary components such as negative tension or allusion to failed expectations. Moreover, although the correlations of the targeted conditions with level of sarcasm were reliable, they were only moderately high, sharing variability with rated sarcasm of about 25% at the best. Thus, it may be that the characteristics proposed as inviting sarcasm might be sufficient, but that any one by itself might not be *necessary* to producing a state of sarcasm. Perhaps a high level of any one of these components is what creates a successful comprehension of a sarcastic utterance. Alternatively, it may be that no one characteristic is necessary but instead what is needed is several of these components to be present before sarcastic intent is communicated. In line with this last proposal, items were occasionally rated as pragmatically *sincere* but at the same time extremely sarcastic, going against the proposal put forth that allusional pretense alone can create a state of sarcasm (Kumon-Nakamura et al., 2007). An example of such an item is provided below.

Example of Generated Items found to be high in Sarcasm and Pragmatic Sincerity:

"Michael and Sandra are driving through the city.

The car in front of Michael cuts him off without warning.

Michael says to Sandra,

'*I love it when people use their signals.'*

Items such as these did not appear often, however they were generally scored extremely low on the insincerity scale but extremely high on the sarcasm scale. This is another example of the conditions proposed by the theories as being generally present but perhaps not necessary for sarcastic/ironic understanding.

The findings from study 1 and 2 have demonstrated through objective and subjective measures that differences exist between the contexts that were generated to make an utterance sarcastic or not. It is apparent that people will incorporate different conditions and characteristics into the contextual information for sarcastic utterances compared to literal. The results from the studies described in Chapters 1 and 2 do not support the necessity of conditions proposed in the implicit display model and the allusional pretense theory of verbal irony comprehension. The findings do support the importance of the proposed conditions but because one can find many instances in which the conditions are not met and still find perceived sarcasm it appears that these conditions are not *necessary* for conveying sarcastic/ironic meaning. Finally, the findings from the studies presented above have provided us with a corpus of empirically generated test items that can be utilized for the investigation of the temporal processing of sarcastic/ironic utterances. One such study is presented in the next Chapter.

Constraint Satisfaction

Given that our data indicates that the presumed conditions for creating a sense of sarcasm are not necessary, one can ask whether an alternative model will fit the data better. Such alternatives would be models in which there are no single set of necessary or sufficient features but instead that comprehension of language in general, including non-literal and sarcastic language, involves utilizing all of the information that a person has at his/her command at any one point in time. With sarcasm this would include the variables identified here but could of course include other variables, such as tone of voice (e.g. Rockwell, 2000), facial expression, discourse markers, humour or, online, use of emoticons.

One way this general approach has been instantiated has been with constraint satisfaction models, a position taken for the other instances of non-literal language (see, for instance Katz & Ferretti, 2001) along with data emerging in the more general language comprehension literature (e.g., Spivey-Knowlton & Sedivy, 1995). In such models, the focus is on the different variables (constraints) present in the context that may increase or decrease the activation of a non-literal interpretation relative to a literal one during the act of comprehension. The determination of meaning, in this case, a sarcastic meaning, is a competitive process. The meaning that emerges ultimately is that which is most activated (itself determined by the strength of the different sources of information available). Thus, as applied to the data presented here, a sense of sarcasm is activated to the extent that negative tension, failed expectation, presence of a victim (etc) all point to the same conclusion and the activation lessens as some of these

constraints provide competing interpretation (as would happen if there was, for an instance, a victim, but no failed expectation).

The studies covered so far have allowed us to directly test some of the claims regarding the necessary components allowing for conveying sarcastic meaning. Here we consider the temporal processing involved in the comprehension of sarcasm. There are several theories related to the temporal processing of figurative language, with these theories differing on whether we are obligated to activate certain information or not (an overview of these theories will be presented in the next Chapter).

CHAPTER FIVE: TEMPORAL PROCESSING OF SARCASM

Over the last two decades, theoretical questions about the processing of nonliteral language have often employed reading time measures as a sensitive means of determining when the non-literal sense is accessed. The initial question addressed within this framework was whether the non-literal (e.g., sarcastic) meaning is accessed directly (given a supportive discourse context) or whether one is obligated to process the literal meaning of the statement before embarking on alternative non-literal possibilities. Some researchers have proposed that the literal version of the statement must be processed before the non-literal version (e.g., Dews & Winner, 1999). According to this viewpoint, individuals must first engage in an obligatory processing of the literal meaning prior to successfully processing the correct figurative interpretation. This has become known as the traditional view, or standard pragmatic view, of language processing and is covered more in depth in a later section.

Other researchers (see Gibbs, 1984; Giora, 2003) have proposed that factors such as contextual information or salience will determine which meaning is processed initially. These direct access models claim contextual information directly invites a literal or nonliteral interpretation and one is not obligated to process either form initially. When exemplified by Gibbs (1984), the claim is that context can inform the interpreter to the extent that the figurative meaning (sarcastic in this case) can be accessed directly without first processing the literal meaning. The graded salience

model (Giora, 2003), on the other hand, claims that we are obligated to process the salient sense of an utterance, despite the accompanying context (though context itself has an effect). In some instances the salient sense is the non-literal meaning, as with highly familiar metaphor or presumably, expressions typically used sarcastically.

The purpose of the study presented in this chapter is to demonstrate the utility of the irony production data produced and analyzed in the earlier chapters. Specifically, the effects of negative tension will be examined. The next section will describe in more detail some of the theories dealing with temporal processing of non-literal language, and also discuss the potential role of negativity in the temporal processing of sarcastic statements.

Overview of Theories Dealing with Temporal Processing of Figurative Language

Standard Pragmatic Model of Language Processing

The traditional view of figurative language processing that has been prominent over the years is now often referred to as the standard pragmatic model. According to this approach, an addressee is first obligated to process the literal sense of a statement, regardless of the accompanying contextual information, and only then seek a secondary (in this case sarcastic) sense if the literal meaning is incompatible with the surrounding context (see Katz, 2000 for a review). The model suggests that a sarcastic utterance such as, “This room is totally clean”, is processed in three steps. First, a person must (a) compute the utterance’s context-independent literal meaning; then the person must (b) decide whether the literal interpretation is the speaker’s intended meaning; and then (c) if the literal interpretation is inappropriate given the context in which it is embedded,

compute the figurative (in this case sarcastic) meaning by assuming the opposite of the literal meaning (Gibbs, 1986).

Dews and Winner (1999) presented participants with examples of ironic praise and criticism on a computer and asked the participants to press a key as soon as they could identify whether the speaker was intending to convey something positive or negative. As well as the ironic/sarcastic examples, they presented their literal counterparts. Consequently, each sentence appeared as both ironic praise and literal criticism, or as ironic criticism and literal praise. Naturally, no participant heard the same sentence embedded within both an ironic and literal context. The logic behind this design was that if the participants process the literal meaning, then the literal meaning should interfere with judging the evaluative tone of the ironic meaning, thereby slowing down responses to the ironic statements (Dews & Winner, 1999). They found results consistent with that prediction: participants took significantly longer to judge sarcastic criticism as negative than to judge the same statement used literally as a positive statement and were slower to judge sarcastic praise as positive than to judge the same statement used literally in a negative sense. Findings such as these (see also Schwoebel, Dews, Winner & Srinivas, 2000) support the traditional or standard pragmatic view of language processing.

Direct Access Models

Gibbs (1994) proposed a direct access model wherein the information present in the accompanying context can immediately direct one to an understanding of the sarcastic target sentence, bypassing the need to first interpret the statement's

literal meaning. In Gibbs (1986, Experiment 1) participants read figurative and literal comments in an elaborated discourse context, advancing at their own pace the passages presented to them on a computer monitor, one sentence at a time. Gibbs varied the passages by context type (positive and negative) and utterance type (sarcastic and literal), finding that the statements in the positive context were read more quickly than the negative statements. However, the reading times for sarcastic and literal sentences did not differ. Gibbs took the equivalency in reading time as a disconfirmation that an obligatory access of the literal sense was not necessary. Naturally, these findings leaves open the possibility that, as a result of contextual information, the sarcastic interpretation can be activated in parallel with literal interpretation or that the context selects for a sarcastic expectation. Regardless, these findings and others have been taken as indicating that people utilize the contextual information available to understand the speaker's intentions in using sarcasm very early in processing.

A cross between the standard pragmatic approach and direct access can be found with Rachel Giora's graded salience model. In this model, the reader/listener of a statement is obligated to process a statement's salient meaning. When there is compatibility between the contextual information and the salient meaning of the utterance, additional processing to obtain meaning is not necessary. On the other hand, if the contextual information is incompatible with the salient meaning of the utterance, the salient but inappropriate meaning will be first processed then the appropriate, less salient interpretation will be retrieved (Giora & Fein, 1999).

Because figurative language can be salient (such as with familiar metaphors or conventional modes of expressing sarcasm), one can find instances in which

figurative language is read as fast or even more rapidly than literal language. Thus, unlike the standard approach, nonliteral language can be processed more rapidly than literal language and, in this way, has similarities to direct access models. In summary, the graded salience model proposes that the temporal processing of statements is not guided by the literal vs. non-literal components or fully by the contextual characteristics leading up to the particular statement. The graded salience model proposes that the meaning of the statement that is processed first is not dependent on whether the statement is figurative or literal, but rather which meaning is more familiar and as a result coded within the mental lexicon (Giora & Fein, 1999).

Constraint Satisfaction Explanations

According to Katz (2004), Pexman (2008) and others, the pattern of findings in which figurative language is sometimes processed more slowly and sometimes more rapidly than literal language counterparts can be most parsimoniously explained by a constraint satisfaction approach. As explained earlier, this approach holds that there need not be necessary conditions to induce a sense of irony (or in fact other nonliteral forms of language, such as proverbial language). Rather a set of sufficient conditions (or information) can either invite or discourage a specific reading. Access of this information occurs continuously in processing with a resolution occurring when one interpretation reaches thresholds. If the various sources of information point towards one interpretation that resolution occurs rapidly, whereas conflicting sources of information require acquisition of additional information before resolution occurs (resulting in longer reading times, for instance). According to this position the

conflicting literature can be explained by differences in the source and strength of information presented in the discourse contexts or associated with the target sentence.

In this chapter we examine the role of one of the contextual factors that have been posited as sufficient for inducing a sense of irony, namely negative tension.

Negativity's Role in Temporal Processing of Irony: Based upon the implicit display model, Utsumi (2000), Ivanko and Pexman (2003) predicted that the processing times for irony would be faster when the contextual information and the target statement fit the more prototypical characteristics of irony. Recall that the implicit display model proposes that a prototypical ironic environment contains failed expectation and negative tension on the part of the speaker as a result of those failed expectations.

According to Utsumi (2000), implicit display theory can explain the disparate findings in the literature, in a manner compatible to that proposed by constraint satisfaction theorists. Utsumi proposes that the equal reading times between literal and ironic statements found in the Gibb's study can be explained by assuming that sarcastic sentences which are highly prototypical ironies and which are embedded within negative contexts are identified easily as ironic. That is he claims that Gibbs presented items within a prototype representation of an ironic environment. As such these items are therefore processed with little to no time difference when compared to the literally appropriate statements. In contrast, Utsumi claims the observation that ironic utterances sometimes take longer to process than their literal counterpart occurs when the ironic context is not very strong (i.e., is a poor representation of an ironic environment), a condition that presumably would be found in Dews and Winner.

There is, to our knowledge, only one test of Utsumi's theoretical explanation. Ivanko and Pexman (2003) created a set of stimuli in which the contexts were ''strong'' or ''weak'' or ''neutral'' indicators of the negativity associated with irony. Targets were ironic or literal statements within that context by altering one word. To make the stimuli appropriate for online methodology, an additional neutral sentence was added at the end of each textoid, to study any ''spill-over'' effect. Two examples of the textoids used in Ivanko and Pexman (2003) and presented here.

Sam agreed to pick Christopher up after school. *Sam never arrived to pick up Christopher and never called to say why / Sam arrived 1 hour late and apologized / Sam and Christopher talked about the dance on Friday*. The next day Christopher is explaining to Jodi what happened. Christopher says:

Ironic statement: Sam is a nice friend.

Literal statement: Sam is a rotten friend.

Wrap-up sentence: Christopher and Jodi were walking home from school.

Terri agreed to help Joan with the toy drive on Saturday. *Terri spent the entire day socializing / Terri spent half the day socializing / Terri spent some of her time helping*. The next day Joan is explaining to Sara what happened. Joan says:

Ironic statement: Terri is a super helper.

Literal statement: Terri is a lazy helper.

Wrap-up sentence: The toy drive lasted from dawn until dusk.

In both examples above the first version was considered as strongly negative, the second as the weak negative and the last sentence as neutral. Recall the prediction arising from implicit display theory is that the strongly negative sentence should be read more quickly than the weakly negative sentence. In fact, Ivanko and Pexman (2003) found that the sarcastic target utterances presented in a weakly negative context condition were read more quickly than a sarcastic target placed within a strongly negative context, a finding arguably inconsistent with the predictions made with Utsumi's implicit display theory.

One can question whether in fact Ivanko and Pexman (2003) provided an adequate test of Utsumi (2000). For one, the target sentences differed from one another and this almost certainly added variability to the data. More importantly, as Ivanko and Pexman point out, the negative contexts they employed may have been too negative, so the implicit display of the speakers' disappointment is not possible and consequently this makes the weakly negative context a better example of prototypic irony.

The database created here presents us with a stronger way to test Utsumi's theory. Recall that participants generated a large number of contexts to ensure that some statements would likely be perceived as sarcastic. These statements were rated on a series of dimensions, including negative tension and sarcasm. From this database we can select items in which the exact same target statement is employed, but in which the generated contexts differ in rated negative tension. Moreover, the ironic targets can be chosen as equally sarcastic in that context, as accessed off-line. Choosing targets in this manner has two advantages. First, any differences in reading times could not be attributed to differences in target sarcasm (as is the possibility in Ivanko and Pexman) but would be attributable to negative tension alone. Second, choosing items in this

manner is a better means of ensuring that Utsumi's concept of an ironic environment is satisfied. The key prediction would be that highly sarcastic items within a high negative tension context would provide a more prototypical ironic environment and hence should lead to a faster resolution of the sarcastic intent than would the sarcastic items in a low negative tension context. Providing the same target when used literally would permit us to see if indeed the literal and sarcastic senses would be accessed equally rapidly, as suggested by Utsumi's analysis of Gibbs.

In addition to providing a stronger test of implicit display, a second novel aspect of our study compared to Ivanko and Pexman (2003) is that we identified the critical word within each target sentence. The critical word is defined as that point in the sentence where either a non-sarcastic (literal) or a sarcastic interpretation is invited; up to that point all the words in the target sentence are the same. It is when reading the critical word that the reader should be able to start distinguishing the sentence as either a sarcastic one or a literal one and it is at this point any differences in negative tension should arise. Much like in Ivanko and Pexman (2003), each target sentence will be followed by a final sentence, in order to accurately measure any potential spillover effect.

In summary, we will establish the participants' reading patterns for the target utterances to determine if they differ based upon the contexts associated with the statements. There will be three types of contexts that surround the target sentences: *Literal*, *Low Negative Tension* and *High Negative Tension.* The target sentences will be the same regardless of the context. For example, the target utterance *"This room is totally clean"* will be placed in a literal context, a sarcastic context with low

negative tension, and a sarcastic context with high negative tension (see next section for full examples of each). The level of negativity and the level of sarcasm will be based upon the ratings established in the earlier ratings task from Chapter 2.

Method

Participants

Forty-five (29 female) undergraduates from the University of Western Ontario who were enrolled in Introductory Psychology were tested and received 1 course participation credit in return. The average of the participants was 22.6 years (*S.D.* = 2.3).

Materials

The stimuli for this experiment included 2 practice items, 21 target items and 4 filler items. Of the 25 test items there were 21 target paragraphs and 4 filler paragraphs. The 21 target paragraphs were comprised of 7 examples each from the three types of contexts manipulated here (Literal, sarcastic-Low Negative, and Sarcastic-High Negative Tension). Participants completed the study on a computer, using the spacebar on the keyboard the advance the words in each sentence. The stimuli were programmed using e-prime software and were presented in a word by word moving windows paradigm. The critical word for each target sentence was identified and agreed upon to a level of 100% by myself and two other independent researchers prior to the analysis.

The following are examples of the target sentences with the identified critical words in bold:

*"I did **great** on the test."*

*"This room is totally **clean**."*

*"She is a **terrific** help."*

The 21 target items were taken from the Context Generation Study reported in Chapter 2. The level of negativity was one of the scales measured in Study 2, in which participants rated each item on several scales. The high-negative items were items that received ratings of 5, 6, or 7 on the negativity scale. The low-negative items were items that received 3, 2, or 1 on the negativity scale. All of these items though were rated as having a high level of sarcastic meaning by participants in Study 2. In other words, all items were rated by the participants in Study 2 as either a 5, 6 or 7 on the 8-point sarcasm scale. The items for both the low negative and high negative groups had similar ratings on the other conditions (allusion to failed expectations; presence of a victim; and pragmatic insincerity). All of these conditions had a mean of around 5.5 rating on these conditions. Therefore, the only condition that was manipulated in the sense of being significantly different between the two contextually negative groups was level of negative tension. Thereby this ensures that it is the level of negativity being measured rather than other conditions having an impact on the processing of the target sentences.

Example items from each context (see Appendix for all items used):

Literal

Sammy's mother asked him to clean up his room again.

Sammy put on some music, rolled up his sleeves and got to work.

After an hour she enters Sammy's room and says,

"This room is totally clean!"

Sammy's mother closed the door and went downstairs.

Low Negative

Sammy's mother asked him to clean up his room again.

Sammy did not clean his room. Sammy tidied, but his room is still messy.

After an hour she enters Sammy's room and says,

"This room is totally clean!"

Sammy's mother closed the door and went downstairs.

High Negative

Sammy's mother asked him to clean up his room again.

Sammy's room looked like a tornado had hit it. Sammy went to his room and just listened to the "Ramones" on his headphones

After an hour she enters Sammy's room and says,

"This room is totally clean!"

Sammy's mother closed the door and went downstairs.

Procedure

A standard moving windows procedure was employed. Participants were instructed to read several short paragraphs on a computer, at a natural pace, advancing the text word by word by pressing the spacebar on the keyboard provided. The participants were also informed that after each paragraph they would be asked a "yes" or "no" question regarding what they just read. The reason for the inclusion of the "yes or no" question following each paragraph was to ensure that the participant attended to, and understood, the text.

Each of the paragraphs was presented on the computer monitor as a series of dashes for each word. Participants pressed the spacebar on the keyboard to reveal each word in the paragraph and replace the previous word with dashes. After the last word of the paragraph was read, the "yes" or "no" question regarding that particular paragraph was presented on screen. The participant pressed the "f" button on the keyboard for a "yes" response and the "j" button for a "no" response. The paragraphs were presented in random order. The entire procedure lasted approximately 30 minutes. Ninety-two percent of the "yes or no" questions were answered correctly, the 8% of items that were answered incorrectly were removed from the analysis.

Results and Discussion

In order to try and clearly establish a reading pattern for each item, seven regions of reading times were identified and analyzed. The seven word regions focused on were: the word preceding the target sentence critical word, the critical word itself, and to examine any spillover effect, regardless of where the critical word

fell within the target sentence, the five words that followed it were included in the analysis.

An ANOVA was performed to compare the effect of context on the reading times of the target sentences embedded within low-negative sarcastic contexts, high-negative sarcastic contexts and literal contexts. The reading patterns for the three groups across the seven regions are plotted in Figure 1. The overall reading times for the 3 context groups showed no significant difference. Looking specifically at the 7 critical regions, the three groups of contexts showed no significant difference in reading times for the word prior to the critical word in the sentence, or the critical word or the third to fifth word following the critical word. The three groups did, however, show a significant difference in reading times at the 1st and 2nd word regions which immediately followed the critical word in the target statements.

First Word after Critical Word

For the first word after the critical word region, the ANOVA showed a main effect for context, $F\ (2, 43) = 4.039$, $p < 0.05$, with the low-negative items being significantly slower than the other two types of contexts for the first word following the critical word. The means for the low-negative contexts were (M = 468.2 msec., SD = 183.63 msec.), for the high-negative contexts (M = 432.83, SD = 141.70), and for the literal contexts (M = 434.36, SD = 158.72). Tukey post-hoc comparisons of the three groups indicate that the low-negative group (M = 468.2 msec., SD = 183.63 msec.) took significantly longer to read than the literal group (M = 434.36, SD = 158.72) and the high negative group (M = 432.83, SD = 141.70).

Second Word after Critical Word

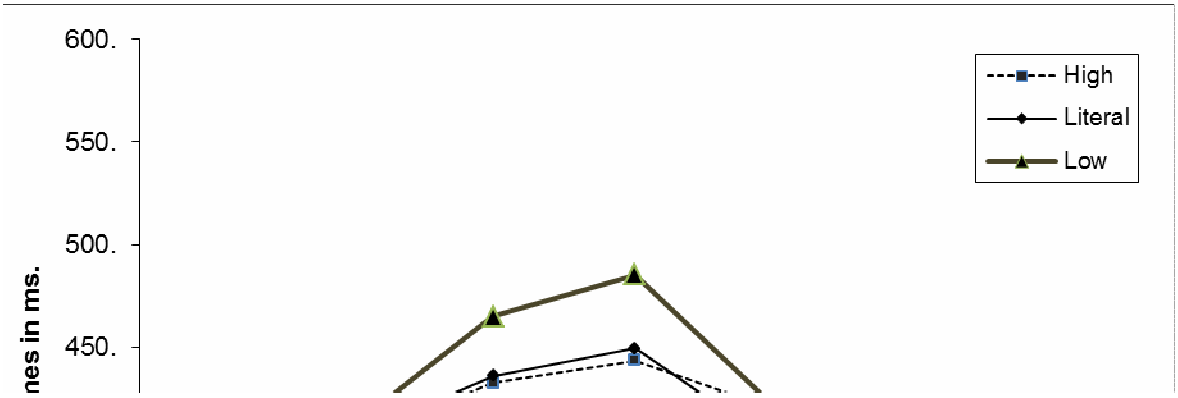
For the second word after the critical word region, the ANOVA also showed a main effect of context F (2, 43) = 6.357, $p < 0.05$. The low-negative context items were once again significantly slower than the other two types of context for this region. The mean for the low-negative contexts were (M = 491.43, SD = 161.42), compared with high-negative (M = 443.27, SD = 130.68) and the literal (M = 457.97, SD = 127.69). Tukey post-hoc comparisons of the three groups indicate that the low-negative group (M = 491.43, SD = 161.42) took significantly longer to read than the literal group (M = 443.27, SD = 130.68) and the high negative group (M = 457.97, SD = 127.69).

As can be seen in Figure 1, and according to the ANOVA, the reading times for the three groups return to having no significant differences by the third word after the target sentence's critical word. There was no significant difference in reading times leading up to and including the critical word, showing equal reading time to that point. The means for the slower reading times following the critical word are generally indicative of what is called a spill-over effect during online processing. This spill-over effect is typically explained as an index of the continuing processing engendered by the critical word. As applied here, the continuing processing would indicate an attempt by participants to resolve an ambiguity: which of the two meanings, literal or sarcastic, is more appropriate in the context. Thus participants here have more difficulty in resolving the sarcastic intend when placed in a low negative tension context. However, within two words following the critical word the ambiguity is resolved (i.e. by the fourth word, the spill-over effect passed and the

reading times were once again comparable for all three groups). This fairly quick resolution of ambiguity is not surprising given that, off line, all the targets used ironically were rated as equally sarcastic.

Figure 1

Reading Times Across the 7 regions for the 3 Types of Context



In conclusion, these data provide strong support for Utsumi's (2000) theoretical position. We now examine these implications for the more general models of figurative language processing. Recall first the standard pragmatic approach, in which it is claimed that it is necessary for individuals to process the literal meaning of an utterance (see Dews & Winner, 1999; Schwoebel, Dews, Winner & Srinivas, 2000), and hence should be read more rapidly than a non-literal sense. This model is not supported here given that the exact same items placed in a high negative tension context and a literal supportive context were read exactly at the same rate. Again, because the same items were employed in all three experimental conditions the data cannot be explained by recourse to graded salience theory.

In contrast, these data are supportive of either direct access or constraint satisfaction models. Recall that the claim of direct access models of figurative language processing is that the contextual information available prior to the processing of the target sentence permits the reader access to the figurative meaning of the statement directly. Constraint satisfaction models propose the weighting of supportive and disconfirming information determines the speed of resolution. Gibbs' (1986) claim is that literal language need not have processing priority, a position also held by constraint satisfaction models. Thus both of these positions are supported here and these data do not provide a way of disentangling between them.

The data thus in general support the prediction put forth by others (Ivanko & Pexman, 2003; Utsumi, 2000) that the level of negativity found in the contextual information impacts the processing times of sarcastic utterances. However, our findings are directly opposite to that found in Ivanko and Pexman ((2003), given we

found facilitated reading when negative tension was high whereas the locus of their positive effects were with low negative contexts. At this point one cannot definitively explain why these differences in findings occurred, especially given the large differences in stimuli and procedures employed. We do feel confident however that what we provide here is a fair and strong test of Utsumi's position, with target statements being equally sarcastic and not differing lexically and other known contextual factors (such as differences in failed expectation or presence of a victim) being kept constant across scenarios.

CHAPTER SIX: GENERAL DISCUSSION

The research in this thesis was designed to address two key areas related to the study of figurative language processing studies. The first question investigated is: "*are there necessary contextual components of sarcastic utterances and if so, what are they?* The second area was to provide an instance of the utility of the database obtained in answering the first set of questions by asking; "*Does negative tension facilitate the processing of sarcastic statements"*

Review of Theoretical Issues

The search for necessary contextual components associated with sarcastic verbal irony has led to various theories of sarcasm comprehension. Identification and comprehension of contextual components are central to many of the theories concerning verbal irony communication (see Implicit Display Model; Pragmatic Insincerity Model; and the Allusional Pretense Model). Each of these theories predicts different combinations of components as necessary for the comprehension of verbal irony. The studies provided in this thesis give a new approach to measuring the presence of these conditions and provides insight as to whether the presence of these conditions should be deemed necessary or just probable. We feel this gives us a clear measure as to whether the conditions predicted by these models are necessary for the successful comprehension of sarcasm. We find that in fact none of the putative "necessary" conditions are in fact necessary though each is a probabilistic indicator of sarcastic intent. As such, the data

presented here is in a general sense supportive of a constraint satisfaction approach to nonliteral language comprehension.

We study also in depth a theoretical implication derived from the implicit display theory in an online reading study. The predictions that follow from this theory is that the level of contextual negativity present in an ironic environment will prime the reader/listener to anticipate the forthcoming use of sarcastic verbal irony to the point where successful comprehension takes place in a pattern similar to that of the comprehension of the literal counterpart. The one previous study in the literature examining this prediction found negativity to be important, but not in manner predicted by implicit display theory. We provide here a stronger and better controlled test of the theory and find support for the predicted role of negative tension. The findings here were also compatible with direct access models and with constraint satisfaction models but not with the standard pragmatic approach.

Summary of Results

The primary purpose of Study 1 was to investigate the necessary conditions of a sarcastic context using a unique experimental approach. Previous studies investigating the necessary conditions of figurative language comprehension generally provided pre-conceived contexts. A unique aspect of Study 1 was that the participants themselves developed the contexts that would successful convey either a meaningful statement or a statement with a sarcastic meaning. The goal of implementing this task was to try and establish whether there are certain necessary conditions that need to be present within sarcastic contexts.

To determine if the participants were successful in producing meaningful and sarcastic contexts a blind coder was hired to code the results. The key components of a sarcastic context based upon the theories are Allusion to failed expectations; Negative tension; Pragmatic insincerity; and Presence of a victim. The coding on the contexts created in study 1 gave some support to the predictions put forth by the theories inasmuch as each of the predicted components was present in the sarcastic contexts. There was also a significant difference in the contexts created to produce literal statements compared to those created to produce sarcastic ones. The purpose of Study 2 was to determine whether the identified and theoretically based components were necessary for creating a sense of sarcasm or were they only sufficient. We argue that necessity would be obtained if items rated at the highest levels of the proposed components were found at the highest levels of sarcasm and absent from the lowest levels of rated sarcasm. In none of the analyses were all the proposed components found to be necessary. Indeed, often only one of the so-called necessary components would be found with high levels of sarcasm. We take these findings as indicating that each of the theoretically identified components are sufficient or "probable" or likely indicators of sarcastic intent rather than being a member of a strictly necessary set of conditions for sarcastic comprehension. The general conclusion that can be drawn from these results is that the conditions that are claimed to be necessary by the extant psychological theories of sarcasm are often present in sarcastic contexts but do not appear to be necessary *per se*.

The overall findings from Study 2 are thus supportive of the constraint satisfaction model. The constraint satisfaction model proposes that different sources of information are continually being considered and integrated during cognitive processing

(see Gibbs, 2001 analysis of Katz and Ferretti's 2001 proposal). In the constraint satisfaction view, constraining information interacts to provide the individual with probabilistic evidence to support one alternative over another, with the competition being determined when one alternative (e.g. nonliteral or literal) fits best (Gibbs, 2001). The constraint satisfaction model has previously been applied to other types of figurative language such as proverbs and metaphors (e.g. Katz & Ferretti, 2001). In the case of the studies reported here, a constraint satisfaction approach would be that the reader or listener uses contextual information to determine the probability of alternative meanings (literal vs. sarcastic). Therefore, according to this view, it is not 1 or 2 specific necessary conditions that need to be present to determine sarcasm but rather any number of clues could summate to allow for the reader/listener to weigh one alternative over the other. In the case of these studies, as long as one of the conditions is strong enough (or a set of weak ones summate) to push the reader to the figurative or sarcastic meaning alternative, then that is all that is needed for successful sarcastic comprehension. The concept of confirmation bias may seem to be present in the structure of the ratings study, due to the fact that we limited our scales to investigate the presence of proposed necessary conditions. However, given the open nature of the context completion task, a logical first step was to find if the proposed necessary conditions were present in those open, sarcastic contexts. From here, one can investigate any number of factors that may or may not be involved in the contextual components of a sarcastic utterance, that is one of the strengths of having a unbiased context generation/completion task to create a testing corpus.

The primary purpose of Study 3 was to investigate the temporal processing of sarcastic utterances in comparison with literal items using the data base provided in the

earlier studies. That is, the reading study employed judiciously selected material to demonstrate the utility of these materials to examine important theoretical questions in the field. In the illustrative case, the role of negative tension was examined, and demonstrated comprehension delays (as determined by elevated reading times) for sarcastic utterances embedded within low negative contextual information. In contrast the same items embedded in a high negative tension context displayed reading patterns indistinguishable from the same target sentence used literally. This study not only provided direct support for one of the predictions of implicit display theory, and demonstrated additional utility for the database generated here but, arguably, also provides data compatible again with a constraint satisfaction interpretation of sarcasm processing.

Constraint Satisfaction

Recall that the constraint satisfaction approach is that comprehension of language involves constructing a meaning that fits the available information in a way that is superior to alternative interpretations. The most likely or "best" interpretation of a statement is the one that provides the most coherent account of what is being communicated. Understanding an ironic/sarcastic utterance according to this view requires people to consider different linguistic information that leads to the best fit for what the speaker is trying to say (Gibbs, 2001).

In terms of the online processing findings from study 3, the constraint satisfaction could be used to help explain the results. It could be argued that the higher level of negativity provides the reader with the information that pushes them towards the sarcastic

meaning being the best fit possible given the situation. Likewise, for the literal items, the contextual information provided leads the reader towards expecting a literal statement given the situation and the information. For the low negative items, the contextual negativity and the accompanying information don't provide enough of an immediate push for the reader to expect a sarcastic statement and therefore the reading times for those target statements were slower than both the high negative items and the literal items for the key processing regions.

More specifically, it could be argued that the level of negativity found in the "high" negativity items are at an optimum level to induce the expectation of a sarcastic statement rather than the literal counterpart. Therefore, constraints against the literal interpretation are in place and strong enough that the best fit meaning for the reader on the high negative context items is a sarcastic meaning. The results of the context preparing the reader for the potential usage of sarcasm is that the sarcastic target statements are processed at equal rates as literal target statements in the literal context items.

Linguistic Inquiry and Word Count

Although the LIWC is not specifically designed to measure differences in figurative language characteristics, the tool did provide some interesting findings when utilized to analyze the generated contexts provided by the two instructional groups (sarcastic vs. open). The objective measure determined that linguistic characteristics associated with the generated contexts of the two instructional groups differed in 31 of

the categories. The contexts that invited a sarcastic reading differed from those that did not in terms of both linguistic variables and those based on judged characteristics.

The main overall LIWC finding was that the words used in the generated sarcastic contexts differed from the words used in the non-sarcastic contexts and that these differences were consistent with the explanations put forth by the sarcastic verbal irony theories investigated. For example the LIWC analysis found that sarcastic contexts were higher in negative language than their literal counterparts, this is consistent with Utsumi's implicit display model.

An interesting finding to come out of the above studies was that by giving instructions to generate sarcastic contexts led to higher sarcasm ratings even when the ratings for the necessary components were Low-Low. Why did this occur? Is it possibly due to a use of different language, language that could be indexed by the LIWC? To investigate this possibility further we ran the low-low items from both of the instructional groups (sarcastic and open) through the LIWC measures. Significant differences were found between the sarcastic and open instruction groups in 16 of the LIWC categories (see Appendix C). A slightly lower number than the number categories that differed when we analyzed all of the items produced by both the sarcasm and open instruction groups but a similar pattern in terms of the types of categories that were significantly different. There were several key categories that were once again significantly different, specifically the categories like *negations; negative emotions; anger; and sadness*. These were significantly higher in the sarcastic instruction group, compared to the open instruction. Therefore, the sarcastic instruction participants seemed to be more willing or more compelled to include negative words in their contexts compared to those

participants in the open instruction group. It is interesting that once again a level of negativity seems to be somehow relevant to the contextual make up of sarcastic contextual information. This difference in use of negative language found by the LIWC would be a very interesting area to investigate further in future studies.

While it is too early to say that the LIWC can detect sarcasm, it at the very least did show significant differences between the contextual characteristics used to convey sarcasm in comparison to the literal counterparts. If this type of objective result was consistently found and replicated it could be logically theorized that the LIWC could be modified to accurately detect sarcastic contexts. At the very least, the LIWC findings from this research show that it could be useful tool in investigating characteristics of the contexts associated with figurative vs. literal language.

Future Directions

One interesting future project based on this research would be to utilize the generated contexts into a production task, whereby the participants see the contexts and must now produce the target statements. This would be more consistent with the experimental design used by researchers in the area, the caveat being that the contexts now used in the production task were created by other participants, not the experimenters themselves. This would be of interest due to the fact that it would mean that both the accompanying contexts and the statements themselves would be produced by participants rather than experimenters themselves. It would be interesting to see if the statements produced by the participants in such a study were consistent with what the theories surrounding sarcastic verbal irony would predict. More specifically, if participants were

just given the generated contexts in isolation and asked to produce meaningful responses, would they produce sarcastic statements? This would be an interesting next phase of investigation not only to substantiate whether this corpus of generated items could alone produce sarcastic statements but also because there currently are only a limited number of sarcasm production studies of any type and this could help fill the gap that currently exists in the literature.

It would also be interesting to address the findings from Colston (2000) that were discussed earlier. Recall that Colston claims that intentional violations of Grice's maxims can contribute to the listener identifying a statement as having an ironic meaning. According to Colston (2000), this intentional violation of one or more of the Gricean conversational maxims, in combination with the portrayal of a contrast between expectations and reality, the speaker and context are priming the listener to anticipate a sarcastic utterance. Using the corpus of generated contexts from this research, one could identify whether violations of any of the Gricean conversation maxims are present and if so do they contribute to the sarcasm scores. To be consistent with the claims in Colston (2000), these contextual items that showed an intentional violation of Gricean maxims would also have to be rated "high" in the category of failed expectations. By taking the set of contexts produced, it may be possible to investigate if the violation of these maxims significantly impact the level of sarcasm found in the target statements. It should be noted that Colston (2000) also cautioned against the viability of a single account of verbal irony comprehension. It could be argued that the findings from the studies presented in this paper support that final claim.

Further investigation into the online processing patterns would also be interesting. The findings from this study support the claim that level of negativity plays a role in priming the reader for sarcastic verbal irony, but what other factors could also play a similar role? Future experiments investigating the potential role of other contextual components could help further the understanding of what factors shift our processing patterns of literal and figurative utterances.

It would also be interesting to utilize that data set created by these studies to test specifically the constraint satisfaction models. This could be done by systematically manipulating factors that point towards a sarcastic response and those that introduce ambiguity. The data set produced here could provide the starting point of such an investigation that hasn't been present in other investigations focused on the predictions put forth by the constraint satisfaction model.

Another interesting area of investigation would be to study other populations of subjects. The majority of the subjects in this study were undergrad students of a certain age range. Would the findings differ if the subjects were from different age or cultural populations? This would especially be of interest to those who believe that our usage and criteria of sarcasm is ever evolving and changing. Perhaps then young undergrad students have a different sense of sarcasm compared to older non-University students.

Conclusion

The research reported in the current thesis was an early attempt at providing a more empirically driven understanding of what contextual components are utilized in the conveying of sarcastic verbal irony. The contradiction between the surface and

intended meanings associated with sarcastic statements have long motivated researchers to attempt to clarify how we use this communication technique. The contextual generation approach was applied in such a way as to help answer some of the questions researchers of figurative language and the use of sarcastic verbal irony more specifically. We find that extant theories have identified factors of importance but not, as claimed necessary factors. Instead the data all point to these factors working as pointers towards a sarcastic interpretation, none of which by itself is necessary to create that sense.

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Appendix A: Items Used in the Context Generation Task

1.

Stan and Jennifer had just finished the exam.

Jennifer turns to Stan and says,

"I did great on that test."

2.

Amanda was volunteering at the toy drive.

Laura says to Paul,

"Amanda sure is a terrific help!"

3.

Chris and Tracy are getting ready to have a picnic.

Tracy turns to Chris and says,

"What a lovely day for a picnic."

4.

Sheila's boyfriend Walter arrived home from work.

Sheila says to Walter,

"You are in a pleasant mood today."

5.

Jean and her husband Frank were leaving the fancy dinner party.

As they were leaving someone said to Frank,

"You sure were the hit of the party!"

6.

Sammy's mother asked him to clean up his room again.

After an hour she enters Sammy's room and says,

"This room is totally clean!"

7.

Jesse and Mark just found out that Brenda got the job promotion.

Jesse says to Mark,

"She totally deserved it."

8.

Julie and Cindy arrive at the party.

Cindy says to Julie,

"This is going to be a great party."

9.

Michael and Sandra are driving through the city.

Michael says to Sandra,

"I love when people use their signals."

10.

Margaret and Diane were eating at a formal dinner party.

Diane says to Margaret,

"You have wonderful table manners."

11.

Harry was helping Diane move her grandfather's clock.

Diane stops and says to Harry,

"You are really helping me out."

12.

Maurice was opening another letter from a University in response to grad school applications.

After reading it, he turned to Tom and said,

"Looks like I am every school's first choice."

13.

Sally came home from a job interview.

Sally says to Ian,

"This job has absolutely the best pay."

14.

Alfred and Maggie decide to eat at a new restaurant they have heard a lot about.

During the meal Maggie says to Alfred,

"What incredible food they serve."

15.

Harry and Ron were waiting at the baggage claim for their luggage.

Ron says to Harry,

"That was a fantastic flight."

16.

Larry made Sally a stew for dinner.

Sally took a bite and said to Larry,

"You sure are a great cook."

17.

Paul's boss walked by his office while he was sitting at his desk.

His Boss stopped and said,

"Don't work so hard."

18.

Ken went to a new barber for a haircut.

After he was done Ken said to the barber,

"Thanks for a great haircut."

19.

Chris and John waited in line 3 hours to see a movie.

After the movie John said to Chris,

"That was worth waiting for."

20.

Anne promised to keep her party dress clean.

When she arrived home her mom said,

“Thanks for keeping so clean.”

21.

George and Betty decided to go to a birthday party.

When they arrived Betty said to George,

“It is really crowded in here.”

22.

Stan and Jennifer had just finished the exam.

Jennifer turns to Stan and says,

“I did great on that test.”

23.

Chris and Tracy are getting ready to have a picnic.

Tracy turns to Chris and says,

“What a lovely day for a picnic.”

24.

Maurice was opening another letter from a University in response to grad school applications.

After reading it, he turned to Tom and said,

“Looks like I am every school’s first choice.”

Appendix B: LIWC Analysis for Generated Contexts

L.I.W.C. factors that were significantly different but did not reach 3% cutoff.

Factor	Group		
	Sarcastic	Open	*F*
Family	0.12	0.43	9.35*
Friends	0.12	0.32	8.85*
Sadness	1.67	0.20	88.40**
Anger	0.91	0.41	8.38*
Anxiety	0.64	0.32	4.08*
Certainty	0.88	1.61	20.50**
Feel	0.94	1.51	12.69**
Bio	2.93	2.28	7.88*
Body	0.96	0.62	9.83*
Sexual	0.04	0.20	7.06*

Ingest	1.61	1.24	6.90*
Motion	1.71	2.78	15.84*
Money	1.03	0.61	10.87*
Religion	0.03	0.11	8.11*
Filler	0.38	0.18	4.46*

** indicates significant at .05 level; ** indicates significant at the .01 level*

Appendix C: L.I.W.C. factors that were significantly different in Low-Low, Instructional Analysis

Factor	Group		
	Sarcastic	Open	*F*
Pronouns	8.8	10.4	9.66*
Personal Pronouns	5.9	7.6	12.14*
3rd Person Singular	3.1	5.3	30.39**
Auxiliary Verbs	11.3	9.6	10.49*
Past	8.7	10.5	10.33*
Present	6.6	4.4	20.94*
Prepositions	9.7	11.9	15.5*
Negations	3.9	1.6	73.95**
Social Processes	10.1	12.2	10.45*

Positive Emotions	3.2	6.4	56.23*
Negative Emotions	4.8	1.4	71.4**
Sadness	1.6	0.3	26.5**
Causation	0.8	1.2	4.35*
Certainty	0.9	1.6	11.95*
Exclusive	3.1	1.4	30.35**
Feeling	0.9	1.8	14.84*

** indicates significant at .05 level; ** indicates significant at the .01 level*

Appedix D: Items Used in the Online Processing Task

Example High/Strong negative tension:

Jennifer fell asleep the night before the big exam.

Stan and Jennifer had just finished the exam.

Jennifer knew she had not answered one answer properly.

Jennifer turns to Stan and says,

"I did great on that test."

Example Low/Weak Negative tension:

Stan and Jennifer had just finished the exam.

Walking out, Jennifer began to regret not studying.

Jennifer turns to Stan and says,

"I did great on that test."

Example of Literal:

Jennifer had been studying for weeks.

Stan and Jennifer had just finished the exam.

Jennifer feels like she did well.

"I did great on that test."

Literal

Sammy's mother asked him to clean up his room again.

Sammy put on some music, rolled up his sleeves and got to work.

After an hour she enters Sammy’s room and says,

“This room is totally clean!”

Sammy’s mother closed the door and went downstairs.

Low Negative

Sammy’s mother asked him to clean up his room again.

Sammy did not clean his room. Sammy tidied, but his room is still messy.

After an hour she enters Sammy’s room and says,

“This room is totally clean!”

Sammy’s mother closed the door and went downstairs.

High Negative

Sammy’s mother asked him to clean up his room again.

Sammy's room looked like a tornado had hit it. Sammy went to his room and just listened to the "Ramones" on his headphones

After an hour she enters Sammy’s room and says,

“This room is totally clean!”

Sammy’s mother closed the door and went downstairs.

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HONORS AND AWARDS

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CONFERENCE PRESENTATIONS

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