

Discourse-Oriented Facial Displays in Conversation

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Beautiful and intelligent at seven — but blind, deaf, and mute — Helen Keller showed in her face a lack of 'mobility, or soul or something,' according to her teacher, Annie Sullivan. The child's face began to be expressive only as she learned to communicate. (Thompson, 1975, p. 55)

Although the topic of facial display¹ has received considerable attention over the years, research on facial displays exhibited in conversation is scarce and for the most part, anecdotal. More commonly, the focus has been on the relationship between facial displays and emotional states (for a review of this area see Fridlund, Ekman, & Oster, 1987). Although facial displays are undoubtedly used at times to convey information about how a person is feeling or reacting, emotion displays do not account for the majority of displays that occur. Ekman and Friesen (unpublished data; see Ekman, 1977; Ekman & Fridlund, 1987) found that in nearly 6,000 facial displays of psychiatric patients, less than one-third were classifiable as facial expressions

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of emotion. This suggests that, although some facial displays may convey information about emotion, there are a substantial number of displays that we know very little about.

A number of researchers have noted the use of facial displays in talk. Birdwhistell (1970) was one of the first to propose that some facial displays serve linguistic functions. He observed that they could be used to mark out emphasis and other aspects of linguistic structure, serve as supplements to speech, or as listener commentaries. Ekman (1979) has suggested that brow movements serve as conversational signals. He described a number of ways they were used by both speakers and listeners to convey information in conversation.

Observation of the use of facial displays in language has not been limited to spoken language. Corina (1989) reviewed three studies in which facial displays were found to serve linguistic functions for users of American Sign Language (ASL). Facial displays helped to mark introductions of topics, clauses, questions, and other syntactic constructions.

In addition to syntactic or grammatical information, facial displays have also been observed to contribute semantic information to the content of the conversation. Ekman (1985) posited 18 different kinds of smiles that can occur in social interactions, each one having a different meaning or function. Brunner (1979) has provided some evidence that smiles can be used as listener "back channels," that is, they provide feedback to the speaker.

In the above studies, both brow movements and smiles were observed to serve different functions or convey a number of meanings. This suggests that the information or the message conveyed by facial displays may be, to some extent, determined by factors other than the physical make-up of the display. One possibility is the act's placement within a context. Ekman (1976) proposed that facial actions can function as facial illustrators — displays that work closely with the spoken content of discourse to convey meaning or content. In these cases, the specific meaning conveyed by a facial display can only be derived when the display is viewed in its conversational context. An example of context-dependent meanings conveyed by one facial display was provided by Sherzer (1973). He showed how the pointed lip

gesture of the San Blas Cuna Indians had a number of different meanings which were discernible only from the syntactic context and co-occurring discourse. In all of the observed cases, the pointed lip gesture remained the same physically. The various meanings of the facial gesture were derived from (a) the general context, or (b) from the preceding question asked by the other interactant, or (c) by the preceding act or interaction.

The idea that meaning conveyed by various acts may only be discernible when the act is viewed within its context is not limited to nonverbal acts such as facial displays. This is also true for words in spoken language. In order to understand the way in which a word is being used (because many words have more than one meaning), one must know the context that the word is embedded in. Context for words and spoken messages can include the general situation (e.g., type of conversation, topic) as well as co-occurring verbal and nonverbal acts.

Studying displays in context implies that they are tightly integrated with verbal and nonverbal acts. Although verbal and nonverbal acts have most often been studied separately a growing number of researchers (Birdwhistell, 1968, 1970; Brannigan & Humphries, 1972; Goodwin & Goodwin, 1986; Kendon, 1980, 1983; McNeill, 1985; Sanders, 1987; Schegloff, 1984; Scherer, 1980) have advocated an integrated or "multichannel" approach to the study of communication. As Pike (1972) has stated, a unified theory of human behavior must allow for the integration of various behaviors and not just the summation of them. Bavelas and Chovil (1991) have proposed an Integrated Message Model as a way of understanding how verbal and nonverbal acts work together and function in conversation. In this model, verbal and nonverbal acts are viewed as linguistic elements that are used to convey messages in face-to-face interaction. These elements can be (a) combined together to produce the whole message or (b) used by themselves to convey messages.

Slama-Cazacu (1976) proposed that messages actually consist of a "mixed syntax," that is, speech, gestures, and facial displays are linguistic elements which are combined together to form the overall message. He discussed how facial displays and gestures are inserted into the sequence of verbal discourse and, like individual words,

become components of the sentence. The use of gestures and facial displays enables the "speaker" to convey ideas or concepts that might be difficult, if not, impossible to convey through the use of words alone. As Kendon (1985) noted, gestures enable the speaker to convey aspects of an idea that may be difficult or impossible to accomplish directly through words (e.g., visual features of the referent). It is also likely that facial displays are a useful means for depicting some action or experience that cannot easily be conveyed through words or gestures.

Facial displays have also been observed to occur in conversation without co-occurring speech, suggesting that they can also convey messages on their own. As mentioned earlier, Brunner (1979) found that smiles can be used as listener responses to speaker's utterances. Although we know very little about this area, it is most likely that there are other facial displays as well that convey messages on their own (e.g., facial shrugs, Ekman, 1977, 1985).

The research described below represents the first stage in a program of study designed to investigate facial displays as discourse-oriented actions. In this research, facial displays are regarded as linguistic elements of a message rather than outputs or "spillover" of emotion processes. The main purpose was to begin to uncover the ways in which facial displays contribute to the production of messages in conversation.

In many studies, facial displays have been analyzed in terms of the physical actions that comprise each display (e.g., Ekman & Friesen, 1978; Grant, 1969; Izard, 1979). In the present study, facial displays were analyzed in terms of information they contributed to the conversation. This direction was pursued for a number of reasons. First, considerably less is known about messages conveyed through facial display than about the physical actions that comprise displays. Second, in social interactions, it is unlikely that participants perceive facial displays in purely physical terms. In addition, they interpret or decode some meaning from them as well. Third, participants decode an *overall* facial message based on the total facial display rather than information conveyed by each individual action. A display of raised eyebrows and widened eyes is not perceived as a group of muscle

actions that contribute different information but rather as an overall message (e.g., disbelief). Finally, although verbal and nonverbal elements are closely integrated in messages, it was still necessary to focus to some degree on the individual acts, in this case facial displays, in order to understand the role each verbal and nonverbal act plays in formulating messages.

For all of these reasons, the logical first step was to obtain a sample of facial displays and carefully analyze both the facial displays and aspects of the context — both the location of the display in relation to the spoken words as well as the general conversational context — in order to discover what contributions facial displays make to conversation.

METHOD

Subjects

Twenty-eight subjects (14 women and 14 men) participated in this study. Their ages ranged from approximately 18 to 65 years, although most were in their early twenties. All were University of Victoria undergraduates who were recruited through the Psychology Department Volunteer Subject Pool. The subjects formed 14 dyads, two of which were replaced because the participants' faces were obscured. This left a total of 12 dyads: Four female dyads, four male dyads, and four male/female dyads.

Topics

The three discussion topics were chosen for the purpose of eliciting a variety of facial displays that might occur in an everyday conversation:

1. *Nutritional Meal*. Participants were told to plan a nutritional meal together using foods they most disliked.
2. *Minor Conflict Episode*. Participants were each told to retell a conversation that involved a minor conflict or argument between themselves and another person.
3. *Close-Call Experience*. Participants were each told to relate a close call or "near miss" situation that they had either experienced or heard about.

Procedure

Potential participants were asked on the telephone if they would be willing to volunteer for a study of conversations. The recruiter explained the study was on conversations and involved videotaping. A time was arranged for volunteers to come to the lab.

The study was conducted at the Human Interaction Lab of the Psychology department at the University of Victoria. Upon arrival for the study the two participants were again informed about the general purpose of the study and videotaping of the conversation. Before the participants were assigned the discussion topics, they were asked to take a few minutes to get acquainted. The experimenter left the room while the participants talked together for approximately five minutes.

When the experimenter re-entered the room, she explained each of the three discussion topics (dinner planning, minor conflict episode, and close call experience) and gave the participants a sheet of paper listing the topics. The conversation began after the experimenter left the room.

Upon completion of discussion of the three topics, the experimenter returned to the room and asked the participants to proceed to the control room, where they viewed the videotape and received a full explanation of the study. After watching the videotape, they provided written permission to use the videotape for analysis and other purposes.

Selection of Facial Displays

For the purposes of this study a facial display was defined as any noticeable movement or change in one or more areas of the face (e.g., brows, eyes, nose, mouth). These movements typically consisted of actions such as brow raising or lowering, eyes widening or squinting, nose wrinkling, upper lip raises, mouth corners pulled back or down, etc. Movements due to blinking, swallowing, inhaling, laughing, or talking were not considered facial displays, but actions such as wiping the lips with the tongue or biting the upper or lower lip were included as facial displays.

There was one important exclusion: Smiles that occurred with no other facial action were not scored. Initial analyses revealed a very high frequency of smiling throughout the conversations and their inclusion would have overwhelmed the other types of displays. In addition, some individuals smiled continuously throughout the conversation. The decision to score facial displays other than smiles was based on economic considerations which limited the number of facial displays that could be scored. This decision should not be taken to mean that smiles were seen as being uninformative or unimportant to conversation.

Development of Linguistic Categories

Although there have been no formal investigations of discourse-oriented displays, there have been a number of researchers who have observed possible functions. These observations provided a base from which to begin examining discourse functions.

Syntactic functions of facial displays such as emphasizees, question markers, punctuation markers, etc. were observed by Birdwhistell (1970), Ekman (1979, 1982) and Grant (1969). Goodwin and Goodwin (1986) described a "thinking face" displayed during a word search. Ekman (1985) identified the facial shrug as a type of emblem which conveys the message "I don't know." Rosenfeld, Shea, and

Greebaum (1979) identified other facial emblems which convey "right" and "wrong." Brunner's (1979) and Rosenfeld's (1987) research demonstrated that important backchannel and other types of listener responses can be conveyed via facial displays. Ekman (1979) observed that listeners used brow movements and facial emblems in response to speaker utterances. Birdwhistell (1970) suggested that facial displays could serve as commentaries on and supplements to speech. Ekman and Friesen (1969) proposed that certain displays (adaptors) have no informational value but rather serve some bodily need or habit.

Interpretation of displays in their linguistic context

The role of and meanings conveyed by the facial displays were determined through careful analysis of each facial display in its surrounding context. The following information was used to arrive at the various functions: Whenever a facial display of interest was observed, its time of occurrence was noted along with who made the display, the speaker or listener. A general description of obvious actions that made up the display (e.g., eyebrows raised, corners of mouth pulled back, eyes squinted, etc.) was then recorded. Although actions were noted, a complete description proved difficult to reliably code. Because the focus was on the information conveyed by the facial displays and not on the facial actions that made up the display, attempts to score physical actions using a modified version of Ekman and Friesen's (1978) Facial Action Coding System (FACS) were not pursued. Only a general description of the most obvious actions was recorded. This description also included noting whether the movements were formed simultaneously or sequentially.

A transcript was made of the verbal content surrounding the display and included marking where the display began and ended (i.e., what word the display began and ended with). Some displays occurred amid only one word, whereas others were held for a clause or the entire

utterance. Other displays occurred before the utterance began, after the utterance was finished, or in the absence of any spoken content.

The relationship of the facial action(s) to various grammatical and structural aspects of the utterance and general discourse provided one basis for determining function. Some displays systematically occurred with particular syntactic features and thus appeared to serve as markers of these syntactic features.

Other displays conveyed semantic rather than syntactic information, that is, they conveyed something about the speaker's opinion or reaction which formed part of the idea being expressed. For each of these displays, the message or idea that was represented through the display was specified. These glosses or verbal paraphrases were based on the assumption that displays can be used as symbolic actions to represent various ideas. Denoting meanings conveyed by nonverbal actions have been done with discourse-oriented gestures (e.g., Bavelas, et al., 1989; Bavelas, et al., forthcoming; McNeill, 1985), but only to a very limited extent with facial displays (see Ekman, 1979, 1985; Goodwin & Goodwin, 1986).

Some of the paraphrases were based on the association of certain emotion labels with particular facial configurations (e.g., raised upper lip is associated with the emotion of disgust, widened eyes are associated with surprise, etc.). In addition to these more stereotypic inferred meanings, some displays conveyed slightly modified meanings associated with stereotypic emotion displays. In these cases, the emotion meaning conveyed by the display was slightly modified as a result of the particular overall message being conveyed. For example, a person suggests to her friend that they go jogging. The friend responds by wrinkling his nose (typically associated with disgust) and saying "I'd rather not." In this case, the display does not depict "disgust" *per se*, but rather "dislike."

As is the case with discourse-oriented gestures, the facial displays were observed to vary in their form, that is, in the combination and complexity of actions involved. Some displays, consisting of similar actions, were found to convey a number of different meanings depending on the context in which they occurred (e.g., lowered brows could reflect puzzlement, anger, thinking, etc.).

Finally, a record was kept as to whether the information conveyed by the display was also conveyed by the words. For example, wrinkled nose action could occur with the word "Yuck" or with the word "Liver." In the first case, the meaning conveyed through the display is also conveyed through the words, whereas in the second case the information conveyed by the face adds to the idea conveyed verbally.

Development of linguistic categories

After all the facial displays had been analyzed they were grouped into different categories according to who made the display (speaker or listener), the kind of information conveyed (syntactic, semantic, or nonlinguistic information), and whether the information was redundant with the verbal content. The categories were: syntactic, speaker redundant, speaker nonredundant, listener comment, and adaptors. The displays were further grouped into specific categories based on the paralinguistic or structural aspects marked by the syntactic displays or the type of information conveyed by the semantic displays.

Reliability in identifying functions

Reliability in classifying displays as to their linguistic function was estimated through inter-judge agreement. Training of the second coder was organized in three phases of increasing difficulty. In the first training phase, a second scorer learned to identify facial displays of interest. When the second scorer had attained 90% agreement with the primary scorer (the author) on the occurrence of a display, she was then given further training as to how to score general and specific functions. This next step included the provision of written definitions as well as transcribed examples of each kind. Following this, the second scorer was shown a videotaped conversation in which the primary scorer identified functions for each display that occurred. The scorer was then given two practice trials in which she had to identify

the general and specific functions for each display without the primary scorer's help (questions about definitions were allowed). When the second scorer had reached acceptable levels of agreement on the two practice trials, she then scored 20% of the data (three dyads who were not part of the practice sessions): One female/female, one male/male, and one male/female. For the reliability trial, the scorer was given a list of the approximate times that a display had occurred and the list of all general and specific functions. The scorer had to judge both the general and specific function by deciding what actions made up the display, whether the display was made by a speaker or listener, and whether it conveyed syntactic, semantic, or nonlinguistic information. In all cases the scorer was asked to justify her decisions. Justification typically consisted of transcribing the verbal content and noting where the display occurred in relation to the co-occurring words or by providing a paraphrase or gloss of the meaning denoted by the display.

Percentage of agreement between the two scorers (number of agreements divided by total number of displays) was calculated for each of the three levels.² As mentioned previously, percentage of agreement that a facial display occurred was 90%. The overall percentage of agreement as to the general function of the display was 97% and percentage of agreement as to the specific function of the display was 89%. Overall agreements for specific categories within each of the general categories were as follows: paralinguistic displays 94%; semantic speaker redundant displays 82%; semantic speaker nonredundant displays 89%; and listener comment displays 87%. In total, there were five possible general functional categories and twenty-four possible specific functional categories. The probability of agreement by chance for the general categories is .2 and the probability of agreement by chance for the specific categories is .04.

RESULTS

Description of Conversations

The average length of the conversation period was 11 minutes and 25 seconds. Mean time spent talking about each of the topics was: Dinner planning, 4 minutes, 2 seconds; minor conflict situation, 3 minutes, 23 seconds; close call situation, 4 minutes.

Descriptive Statistics

Female dyads tended to be somewhat more expressive than the male or male/female dyads. Female dyads produced 40% of the displays with the male dyads and the male/female dyads producing 27% and 33% of the displays, respectively. This finding was not due to differences in length of time speaking for each type of dyad.

Types of Facial Displays Found

In the following section the various types of facial displays that were found are described and examples of most types are given. Only the specific category displays that occurred with some frequency are discussed. Others which occurred only infrequently are mentioned at the end of each section. Because of their limited occurrence, further investigation is necessary to be confident about the function of these displays.

The frequencies of displays across the general categories are shown in Table 1.

Table 1
*Distribution of Facial Displays Across General Categories**

Linguistic Categories

Syntactic	27%	(315)
Semantic Speaker (Redundant)	21%	(243)
Semantic Speaker (Nonredundant)	14%	(162)
Listener Comment	14%	(160)

Nonlinguistic Categories

Adaptor	25%	(301)
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<i>Not Assigned a Category</i>	< 1%	(3)
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<i>Total</i>		(1184)
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*Raw frequencies are in parentheses.

Syntactic displays

Syntactic displays formed the largest general category. These were facial displays that (a) appeared to mark stress on particular words or clauses, (b) were associated with syntactic aspects of an utterance or (c) were associated with the organizational structure of the talk (e.g., initiation of topics). The most common facial actions observed were the raising or lowering of brows. Other facial actions observed included widening or tightening of the eyes. The frequencies of the specific kinds of syntactic displays are given in Table 2.

Table 2
*Distribution of Facial Displays Across the Specific
 Syntactic Categories**

Specific Category [†]	% of Total Syntactic Displays	
<i>Grammatical Markers</i>		
Emphasizer	50%	(156)
Underliner	18%	(57)
Question Marker	14%	(45)
Offer	4%	(13)
Sentence Change	3%	(9)
End of Utterance	2%	(5)
Comma	< 1%	(1)
<i>Organization of Story</i>		
Story Announcement	2%	(5)
Story Continuation	6%	(18)
End of Story/Topic	1%	(3)
Topic Change	< 1%	(1)
<i>Speech Corrections</i>		
Pronunciation Correction	< 1%	(1)
Self Correction	< 1%	(1)

*Raw frequencies are in parentheses.

†Categories are not ordered by frequency but are grouped according to similar functions which is the way they are discussed in the text.

The highest percentage of syntactic facial displays found were associated with grammatical aspects of utterances. Many of the specific categories found in the present study were observed by Birdwhistell (1970) and Ekman (1979). The most common specific category was the *emphasizer*, a display that occurred with a stressed (prosodically marked) word in an utterance. The most common facial actions were brow movements. Occurrences of these and other displays are marked in examples by square brackets. In the example below the action consisted of brows raised on the stressed word, "really."

(1) This is [really] silly as well.

Longer units of speech, usually clauses, were also found to be marked by facial displays. Ekman (1979) called facial displays that accompanied these units of speech *underliners*. They were identical to *emphasizers* except that the action was held for a longer duration and marked out clauses. For example, a brow raise occurred with the following statement, during the final clause.

(2) The only minor conflicts I can think of are with my roommate
[and they're darn childish].

Question marker displays were also found. These facial displays regularly occurred with utterances that were either grammatically structured as a question, for example,

(3) [Are we supposed to eat this meal too?]

or with utterances that were said with a rising inflection such as the example below.

(4) [You don't wear your seatbelt?]

As Ekman (1979) suggested, both raising or lowering of eyebrows could mark questions.

A related specific category found in the present study consisted of those displays marking *offers or suggestions*. For example, when

planning the meal individuals suggested to each other possible foods they could include. In doing so, they would often "offer" various foods.

(5) Well, first of all we have to have a meat. [Liver].

Another speaker (from a different dyad) said

(6) We could have like [tofu on on (*sic*) rice cakes as an appetizer].

In both cases, the speakers raised their eyebrows at the point they named the particular food. The individuals were not asking the other person "How about...?" (no rising inflection) but rather issuing suggestions that could be accepted or rejected.

Another specific category consisted of those facial displays that occurred with *sentence changes*. In these cases a person began to say something, but then decided to express it differently. In the example below the speaker raised her eyebrows at the point of change.

(7) ...We put the we [leave] the choice up to the guests.

Some displays appeared to signal the *end of an utterance*. These displays occurred either with or immediately following the last word. They typically consisted of eyebrow raises; sometimes only one brow was raised.

(8) Definitely nutritious, I'm sure [].

Other facial displays appeared to help structure the conversation. These displays marked the *announcement* (of a story or topic, the *continuation* of the story or topic, and the *ending* of a story or topic. Brow actions were the most common markers observed. For example, one participant marked the beginning of a story by raising her eyebrows, widening her eyes and looking up while saying

(9) Um, [my dad], conflict with my dad.

This statement introduced a minor conflict story. The facial actions that occurred with this opening statement set it apart from the rest of the story that followed.

Story continuation displays occurred with discourse shift markers such as "so," "but," "then," "so anyways," etc. They occurred after the speaker had been side-tracked away and was returning to the main point. An example of a story continuation display was

- (10) ...you just reach up and grab it and pull yourself around,
[anyhow] um I was kayaking up...

The word "anyhow" was marked with an eyebrow raise; it appeared to alert the listener that the speaker was returning to the main point.

A few facial displays also marked the *end of a story* or the topic. The utterances indicated that the person had finished telling the story or that the participants had finished with that part of the task.

In addition, other facial displays appeared to serve as a comma, to mark a topic change, and to mark speech corrections, but they occurred infrequently and thus it was not possible to determine whether they occurred systematically.

Semantic speaker displays (redundant)

The second largest linguistic category comprised speaker displays that conveyed information which was also conveyed in the words. These displays illustrated a part of the idea being conveyed verbally, and thus most resembled many of the speech-related hand gestures that occur with words. For example, a person might have said "I think liver is disgusting" and wrinkled her nose simultaneously. Some speaker redundant displays created a message of a more intense reaction than might have been possible if only words had been used. For example, a facial display (e.g., brow lowering) can be used to show that "She *really* hated it" rather than "She did not like it." Although at times the display was easily interpretable (e.g., raising one side of the upper lip to indicate disgust or dislike), other speaker redundant

displays were more ambiguous. As Slama-Cazacu (1976) found, many displays were not entirely and clearly outlined. The displays observed in the present study usually consisted of individual actions normally associated with reactions such as surprise (widened eyes, raised brows and dropped jaw); anger (tight mouth, slitted eyes, lowered brows); puzzlement (lowered brows), etc. However, because only portions of the actions involved in these more complex displays occurred and the movements employed across various displays overlapped, their meaning was ambiguous apart from the context of the conversation.

Speaker redundant displays were grouped into specific categories based on the kind of semantic information that was inferred from the display. The frequencies for each of the specific categories are given in Table 3.

Personal reaction displays were displays judged to convey information about an emotion or evaluation about something said in the conversation or to the task itself. They formed the largest group of redundant speaker displays. These displays illustrated liking or disliking something; depicted various emotions such as disgust, surprise, or excitement; illustrated opinions about the topic or a specific idea being discussed (e.g., "That was stupid."); or indicated problems with the task itself (e.g., difficulty in coming up with a particular food or story).

The following are some examples of personal reaction displays. In example 11, the speaker raised her eyebrows, then raised one side of her upper lip, and squinted her eyes which was seen as illustrating her dislike of the dessert.

(11) ... [I hate, I hate desserts with alcohol in them].

Another speaker talked about how her son's constant questioning irritated her at times. As she said "exasperating" she raised her eyebrows, and widened and rolled her eyes.

(12) ... Sometimes I find them amusing, other times I find them [exasperating].

Table 3
*Distribution of Facial Displays Across the Specific Semantic Speaker (Redundant) Categories**

Specific Category	% of Total Speaker (Redundant) Displays	
Personal Reaction	36%	(87)
Portrayal	34%	(83)
Thinking/Remembering	8%	(20)
Facial Shrug	7%	(17)
"Yes"	6%	(15)
"Not"	3%	(7)
"But"	2%	(5)
"No"	2%	(4)
Qualifier	1%	(3)
Clarification	<1%	(1)
Explanation	<1%	(1)

*Raw frequencies are in parentheses.

Portrayal displays were the second largest group of redundant speaker displays. These displays (a) marked the re-enactment of a past conversation or (b) were re-enactment of past reactions or emotions (either the speaker's or someone else's). In the first case, the display coincided with the part of an utterance that conveyed something said in a prior conversation. The display appeared to function like quotation marks around the speech and help indicate that the statement should be understood as a re-enactment of a previous statement. These

displays typically consisted of eyebrow actions, often brow raises. One speaker recalled a time when her father asked her to do something when she was very busy. As she enacted his utterance she raised her eyebrows.

(13) And he said, [Well it will only take five minutes].

The second kind of portrayal displays were those that re-enacted the way someone had looked in the past. These displays sometimes illustrated prior emotions but could also be re-enactments or pantomimes of a previous facial display. In the next example, the speaker described how a person had given him a particular kind of "look."

(14) and the guy just sort of looked [] you know,
sorta looked down at me.

The speaker re-enacted the look by tilting his head down, lowering his eyes, and forming a straight mouth.

An example of denotation of a previous emotion occurred when one individual related a time when her father asked her to do something when she was very busy with homework. She illustrated her irritation at her father:

(15) but I was like [errrrr].

The accompanying facial display consisted of a narrowing of the eyes and a tight, straight mouth with slightly pursed lips. The display, along with the vocalization, conveyed the idea that she had been angry at the time.

Thinking/rememering displays were another type of speaker redundant display. These displays accompanied words indicating that the speaker was thinking, or recalling an event from memory, or searching for a word. "Thinking faces" were described by Goodwin and Goodwin (1986) who observed individuals withdrawing their gaze when involved in a word search. In the displays observed here, individuals would frequently lower their eyebrows in a frown, or raise them while looking off in the distance, close their eyes, pull one side

of their mouth back or twist their mouth to one side. These displays accompanied utterances containing filler words such as "um," "ah," etc. An example of a *thinking/remembering* display that consisted of retracting the mouth corners was:

(16) ... the last disagreement I had was um [] with my mother actually.

Another specific category was the *facial shrug*. These displays illustrated verbal expressions such as "I don't know," "Oh well," "Okay." This "I don't know" differs from personal reaction displays of difficulty in remembering, in that the words are usually said offhandedly or as asides or fillers, suggesting that the person does not literally mean that he or she does not know. The facial shrug also occurred at points when the person conceded something in the discussion, was reacting with resignation, or decided when they had done something well enough. The facial configurations were less complex than those described by Ekman (1985) and often consisted of eyebrow flashes (a sudden raising of the brows and a return to normal) or a retraction of one mouth corner. In example 17, the person quickly flashed her eyebrows as she said:

(17) [I don't know], well I don't like snails no.

Displays also occurred with "yes" and "no" responses made by the speaker. Usually these displays consisted of eyebrow raises. Another type of speaker redundant display marked abstract verbal *negation* ("not"); these displays consisted of lowered eyebrows, closing of the eyes or wrinkling the nose (the last two actions are symbolic of shutting out or rejecting the suggestion). In the example below the speaker wrinkled her nose as she said:

(18) ... [That's not] really nutritious.

Other specific types of displays that were observed too infrequently for inclusion were those that marked the use of "but," a qualifier such as "probably" in a statement, and clarification of a previous statement.

Semantic speaker displays (nonredundant)

The third general linguistic category of facial displays found was nonredundant speaker displays. These were displays that conveyed information that was not found in the spoken content. These displays also occurred in absence of any speech and in these cases the message was determined from the general context; for example, in a number of instances, the individuals would be thinking in silence about what foods they could include in the dinner planning. One individual retracted one side of the mouth which was interpreted as a message that the individual was in the process of thinking about possible foods.

The frequencies for the specific categories of nonredundant speaker displays are given in Table 4.

Personal reaction displays accounted for almost half the nonredundant semantic speaker displays. These displays accompanied a speaker's utterance but added information about the speaker's reaction or opinion. The facial actions varied depending on the specific meaning conveyed by the display. In the example below the speaker squinted her eyes and wrinkled her nose which was interpreted as conveying dislike.

(19) [Basic steamed white rice].

Personal reaction displays could also convey information about a reaction to the ongoing conversational situation, such as difficulty in answering.

Thinking/remembering displays formed the second largest specific category. These displays were interpreted as meaning that the person was thinking about something or remembering an incident and usually consisted of eyebrow raising or lowering, mouth twisted to one side, or one corner of the mouth pulled back. These actions occurred with or without accompanying speech. In example 20, the speaker was relating an incident in which her kayak tipped over. The other speaker asked her if she ever went kayaking again after that. She stated

Table 4
*Distribution of Facial Displays Across the Specific Semantic
 Speaker (Nonredundant) Categories**

Specific Category	% of Total Speaker (Nonredundant) Displays	
Personal Reaction	45%	(73)
Thinking/Remembering	27%	(43)
Facial Shrug	19%	(31)
Interactive	4%	(7)
Metacommunicative	2%	(4)
Qualifier	< 1%	(1)
"Yes"	< 1%	(1)
Unclassified	1%	(2)

*Raw frequencies are in parentheses.

(20) Actually we had to get into kayaks again [and I rolled actually again] in the Gorge but I didn't panic.

The display consisted of eyes tightened and was interpreted as her remembering what had happened after her initial episode in the kayak.

Many of the thinking/remembering displays were observed during periods of silence which would occur at, for example, the beginning of a topic when the two individuals were thinking about foods to include or an incident to relate. At these points in the conversation, individuals raised their brows briefly, twisted the mouth to one side, or retracted back one corner of the mouth which was seen as a message that they were mentally working on the task.

Facial shrugs were the third largest specific category found. This category is identical to speaker redundant facial shrugs except that the information was not also conveyed verbally. The actions included the corners of mouth pulled down into a horseshoe shape as well as brow flashes and retraction of mouth corners. An example of a facial shrug occurred when one speaker had just finished relating a minor conflict episode. At the end of the utterance he pushed out the bottom lip and raised the brows which was interpreted as "That's about it."

(21) That was only a couple of days ago but ah [] l.

Another specific category was *interactive displays*. These displays occurred with the words "You know?" and were interpreted as a means of acknowledging the listener while still keeping the floor. They often consisted of eyebrow raises:

(22) I was going to say spinach salad because [you know], how everyone ...

A smaller specific category consisted of *metacommunicative displays*. These displays were facial actions that, when used in combination with the spoken content, produced an overall meaning of sarcasm or defined the utterance as a joke. For example, in one conversation, the first speaker had just finished reviewing all the disliked foods the two participants had agreed to include in their imaginary meal. At the end, the second speaker commented

(23) [Mmmmm].

At the same time, the second speaker raised the brows and upper lip. In this case, the sarcasm was communicated through the contradiction between communicating a positive reaction towards the foods and a display which conveyed a message of slight disgust.

Two facial displays appeared to convey the messages "yes" and "Yes, but..." (a qualified statement). However, they were not observed in any other situations. Two displays were also observed that could not be classified into any specific category.

Listener comment displays

The fourth general linguistic category was listener comments. A participant was defined as being in the listener role when he or she was the recipient of talk, that is, he or she was not the person doing the majority of speaking at the time. (If neither person was speaking, then both were considered to be speakers.) Listener comment displays were therefore displays made in response to speakers' utterances and typically occurred while the speaker was still talking or at the end of the speaker's utterance. The frequencies of the specific categories found are given in Table 5.

The largest category found was *back-channel* responses. These were displays that were produced by listeners while the speaker was talking or at the end of the speaker's turn. Sometimes the display

Table 5
*Distribution of Facial Displays Across the Specific
Listener Comment Categories**

Specific Category	% of Total Listener Comment Displays	
Backchannel	53%	(84)
Personal Reaction	30%	(48)
Motor Mimicry	13%	(21)
Understanding	2%	(3)
"Yes"	2%	(3)
Agreement	<1%	(1)

*Raw frequencies are in parentheses.

accompanied a vocalization such as "uhuh," "mhmm," "yeah," etc. Brunner (1979) hypothesized that back-channel responses help to inform the speaker that the listener is attending and following what is being said. Back-channel displays typically consisted of brow raises, mouth corners turned down, eyes closed, or lips pressed. In example 24, the speaker is talking about how the roads can get slippery from car oil, especially when it first begins to rain. The verbal utterance "Mmmm" was marked by an eyebrow raise.

- (24) Speaker: ... especially if it starts raining.
 Listener: [Mmmm].

The second largest group found was *personal reaction displays*. This type of display was distinguished from back channels in that the facial display was often more pronounced or exaggerated than those designated as back-channel display. They appeared to be a stronger comment on what had been said; that is, the message was interpreted as a reaction in response to what the speaker had said rather than just acknowledging the content. The actions that made up the displays involved various parts of the face, depending on the particular reaction displayed by the listener. In the next example, the speaker has received a grade of 92% on a test. She goes on to relate how her father had remarked

- (25) Speaker: ... Why didn't you get a hundred?
 Listener: []

The listener responded with a facial display that consisted of raised eyebrows, widened eyes and a jaw drop which was translated as indicating disbelief and surprise that the speaker's father had said that instead of praising her for doing so well.

Another listener responded with raised eyebrows to the speaker's statement that his roommate had never drunk alcohol before:

- (26) Speaker: ... had never drunk before he came to university.
 He's in first year.
 Listener: []

This display was interpreted as indicating a reaction of amazement to the fact that the roommate had never drank alcohol until he came to university.

Probably the most interesting of all the listener reactions were *motor mimicry* displays (Bavelas, et al., 1986). These displays were made by listeners in response to the close call stories and took the form of displays that might occur in the actual situation (e.g., wincing after hitting one's thumb with a hammer, eyes widened and open mouth in response to a frightening situation). They were interpreted as messages that indicated a sincere appreciation of the situation being described. An example of a motor mimicry display was

- (27) Speaker: ... and um I fell and I did like I did a double back flip.
Listener: [Oooooo].

The display consisted of eyebrows drawn together and down, eyes squinted, and on "O" shaped mouth with lips slightly parted and pushed forward. It conveyed an appreciation of how painful that must have been.

A smaller group of displays were interpreted as indicating a more general *understanding* or appreciation of the situation rather than illustrating a reaction appropriate to the specific situation. However, the small number of occurrences made it difficult to determine whether displays did serve this function. A very small minority of displays were found that may have conveyed "yes" or agreement with the speaker. However, again there were too few occurrences on which to base a category.

Adaptors

Adaptors accounted for 25% of the facial displays scored. The most common actions seen were around the mouth area, such as wiping the lips with the tongue, biting one lip, or pressing lips together. These appeared to be the result of physiological need or nervousness and did not appear to convey any syntactic or semantic information.

Other actions were a result of another behavior (e.g., scratching the forehead) or physiological discomfort (e.g., sore eyes).

DISCUSSION

The results of this study have shown that when facial displays were analyzed in terms of their relationship to linguistic features and the messages conveyed by the displays, they were found to have important discourse functions; they marked out various discourse features and illustrated or added semantic content. Both speakers and listeners were found to use facial displays in a variety of ways. The displays occurred both on their own and within spoken utterances. Furthermore, this method of determining functions and meaning was shown to be highly reliable.

The results of the present study rest on the assumption that the information conveyed by facial displays is dependent on the context they occur in. Meaning conveyed by the displays cannot be understood by examining the physical properties of the display by themselves but rather by seeing the actions in their verbal and conversational context. It is through examination of the facial displays in their linguistic context that the discourse functions of facial displays are revealed. The results have suggested ways in which facial displays can mark, illustrate, or add to, or combine with the verbal elements of discourse to produce messages. If most of our facial displays are spontaneously generated in the production of speech, then it is likely that additional functions will emerge in other types of conversation. The present research is limited in that only three topics were sampled and the interactants were strangers. Other topics may reveal different functions. Close friends or married couples may also communicate other kinds of information facially. In addition, linguistic functions of smiles have yet to be explored using this approach.

It is important to recognize that in order to place semantic displays into specific categories, it was necessary to determine the message conveyed by the facial displays. Although individuals most

likely do this in their conversations with others, paraphrasing or glosses of facial displays has seldom been done in research. Validation that participants decode conversational displays in this way is an important next step.

The present study also focused on the message conveyed by the whole display rather than by breaking down the display into its respective components. However, in attempting to discover how facial displays function, it became very apparent that certain components (e.g., brow movements, actions around the eyes) served a number of different functions (alone or when in combination with other facial components). The clearest example of this is brow movement. In the present study, brow actions were found to convey both syntactic and semantic information. Among other functions, brow movements provided emphasis; marked questions and offers; and formed part of the displays that conveyed reactions such as surprise or disbelief, or indicated listener attention.

One possible research direction would be to investigate whether certain facial actions have a general message which can be combined with other facial actions to convey more complex messages. Ortony and Turner (1990) proposed analyzing subcomponents of facial displays as a way of understanding the roles that facial actions can play and how they can be combined with other subcomponents to convey qualitatively different messages. They used as their example the furrowed brow, which occurs in a number of facial displays (anger, frustration, puzzlement, concentrated attention to a problem, a difficulty encountered in a task, and blocks in immediate understanding). The common component in all of these reactions is the blockage of an attempt to immediately achieve a goal. Smith (1989) reported some empirical evidence for the connection between the perception of an obstacle (goal blockage) and the frown. This could be extended to other facial actions, to see if there are other themes associated with particular actions and how they combine with other actions to produce more complex or qualitatively different messages. It is hoped that once the possibility has been opened that facial displays serve as more than indicators of emotion, others will begin to take a closer look at the important role that facial displays play in conversational processes.

goal
blockage

Notes

1. Facial movements have been referred to in a number of ways. For the purposes of this paper, the term "facial expression" is used only in reference to facial expressions of emotion. The term "facial display" is used in reference to a broader range of facial action functions.
2. The decisions for each of the three stages were to some extent interdependent, that is, the decision about the specific function was not independent of the decision that a display occurred or the decision about its general function. Error that occurred at the earlier stages affected future decisions. Therefore in order to identify specific sources of scoring error, reliability was assessed for each decision stage.

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