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Publication Date

1990

A1458
no. 90-4
1990

✓ 4/2/90

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EMOTION AND COGNITION IN POLITICAL
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Nonverbal Behavior and Leadership: Emotion and Cognition in Political Information Processing

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Social psychologists have shown that attitudes towards an observed person are shaped by the emotional responses to the person's nonverbal behavior (Cacioppo and Petty, 1979; McGuire, 1985; Lanzetta, et al., 1985), but only a few political scientists (e.g., Marcus, 1988) have focussed on the role of these variables in mediating attitude change. Moreover, because political scientists so often rely on survey data, attitude formation and change have rarely been analyzed directly using experimental methods to assess how citizens process political relevant information (for exceptions, see Iyengar, Peters and Kinder, 1982; Iyengar and Kinder, 1985, 1987; Lau, 1985; Lodge, McGraw and Stroh, 1989). In this chapter, we outline a theoretical explanation of the effects of leaders' nonverbal cues, and summarize a series of experiments in which viewers in both the United States and France have been shown exemplars of leaders exhibiting different facial displays.

There are substantive reasons for looking more precisely at episodic political information processing, using experimental methods and naturalistic stimuli. Television, which has become the central medium of communication in modern politics, differs from print media in ways that can shape the political process, since in addition to combining visual and verbal stimuli, it provides frequent close up images of known and powerful leaders.¹ As a

¹In a recent study of nightly TV news, for example, leaders were visible on the screen during 14% of the duration of French newscasts, 17% of American newscasts, and 30% of German newscasts; a large proportion of these excerpts are brief "visual quotes" (less than six seconds) communicating an image without sound (Frey and Bente, 1989; Masters, Frey, and Bente, in preparation).

result, the average citizen learns of events while watching a communicative medium that provides immediate impressions of leaders and events on a day-to-day basis. In this process, it should hardly be surprising that the episodic emotions known to play a role in associative learning interact with cognitive cues in producing changes in the viewers' attitudes and opinions.

In testing hypotheses on attitude change derived from theories of political cognition and emotion, therefore, television is a valuable resource (Iyengar, Peters, and Kinder, 1982; Iyengar and Kinder, 1985, 1987). In the studies reported here, the naturally occurring images of leaders shown on TV have been used as experimental stimuli to assess what actually happens when citizens see leaders on a daily basis. The exemplars of facial displays, chosen on the basis of objective criteria derived from social psychology and ethology, are comparable to "visual quotes" of leaders that are typically shown on television news (Masters, et al., 1987; Joslyn and Ross, 1986; Frey and Bente, 1989). The experimental results show that such facial displays can affect attitudes, emotions, and impressions in politically important ways.

Theoretical Framework

There are good reasons for assuming that the nonverbal behavior of leaders might be a relevant cue in the formation of public attitudes toward rivals for power. Western literature provides ample evidence that leaders attended to such behavior as a crucial element in establishing and maintaining dominant status (e.g., Shakespeare, *III Henry VI*, iii, 3. 168-195; *Henry V*, iv, 1, 103-111; Milton, *Paradise Lost*, II.302-309); training in nonverbal behavior, and especially in facial display, was once an integral part of teaching rhetoric (Courtine & Harouche, 1988; for an example, see Scott, 1820). Such nonverbal cues play an important role in social interaction among nonhuman primates and human children (Hinde, 1982; Montagner, 1977; Kagan, 1988; Chance, 1989), and have increasingly been recognized as a basic element in theories of

human social and political behavior (Frank, 1988; MacDonald, 1988; Masters, 1989a).²

Before television, a leader's nonverbal cues were mainly seen by influential opinion leaders; when the general public learned of political discourse only through printed reports or by word of mouth, displays of emotion had their effect primarily by focusing the attention of opinion leaders, who then disseminated some statements rather than others to the mass. As long as printing was the main source of political communication, therefore, leaders' messages often appeared as verbal statements when they reached the average citizen. Since television has increasingly exposed the citizens of all Western democracies to close-up images of their leaders, it is now of great practical as well as theoretical interest to study the effects of facial displays in varied political systems.

Recent evidence suggests that there has been a change in the basis for voter preference in the United States and Western Europe. Leadership style is now more important while party loyalty has declined in shaping levels of support or opposition to political leaders (Atkinson, 1984; Iyengar and Kinder, 1987). Television may be partly responsible because viewers daily see close-up images of political leaders and newscasters exhibiting facial expressions that communicate emotion and suggest character (Rosenberg, et al., 1986; Muller, et al, 1986). Moreover, such styles may affect the way citizens think about issues and political outcomes (Bower, 1981; Bower and Gilligan, 1982).

How do political leaders evoke emotions and impressions that modify attitudes towards them? First, they are held accountable for the perceived consequences of their actions. In recent years,

²On the importance of nonverbal communication in traditional political theory, see Bernard Mandeville, *Fable of the Bees* (Oxford, Clarendon Press, 1924), II, 286-87; Jean-Jacques Rousseau, *Second Discourse* (N. Y.: St Martin's 1978), 122-123.

research has burgeoned on theories of "retrospective voting" in which vote choice is determined by cognitions about and emotional responses to the recent political past rather than prospectively to what candidates promise (Fiorina, 1979). Secondly, differences in candidate style in presenting the issues can lead voters to associate them more or less strongly with particular issues (Roseman, et al., 1986). Thirdly, political leaders can elicit emotions and convey impressions by their nonverbal style, including voice quality and facial expressions (Lanzetta, et al., 1985; Masters, et al., 1986; Sullivan and Masters, 1988).

Over the last ten years, research has shown that such emotions are important determinants of political attitude towards presidential candidates (Abelson, Kinder, Peters, & Fiske, 1982). In the Abelson study, positive and negative emotional response scales were constructed from voter recall of specific emotion-evoking episodes for each candidate that involved the positive emotions of hope, happiness, pride, and sympathy and the negative emotions of anger, disgust, fear, and uneasiness. This study showed that responses towards the candidate on the two emotional scales and on trait attributions were roughly equal in weight, and that both played a stronger role in predicting attitude than did the traditional variables of party identification or issue position.³ More recent research has replicated and reinforced many of the Abelson findings (Marcus, 1988).

In addition to the revival of interest in emotion as a determinant of attitudes towards leaders, recent research has

³ Of course, it can usually be assumed both that party identification is causally prior to the episodic emotional responses and lasting attitudes toward each candidate that are formed during a campaign, and that partisanship can shape attitudes towards the leader either directly or through indirect effects on such emotional responses. But without some understanding of the role of emotion in political information processing, it is hard to conceive of a theory linking short term experiences with attitude change. On the importance of reintroducing emotion in areas of political analysis and theory which have been dominated by an exclusively "rationalistic" view of cognitive processing, see Baier (1987, in press).

again focused on voters' perceptions of the personal characteristics of political leaders. As early as 1966, Donald Stokes bemoaned the lack of an adequate theory of trait attributions (Stokes, 1966). More recent research has shown that voters' impressions of candidate's personality characteristics affect their political attitudes towards them (Popkin, et al., 1976; Kinder, 1986).

Kinder hypothesizes that voters consider the character of the candidate to be of central importance in their vote decision because they believe -- rightly or wrongly -- that character is fate, that candidate traits predict future performance. Thus it is subjectively rational for voters to invest in the attribution of traits to candidates as long as the cost of such investment (Popkin, et al., 1976) is relatively low. Although Popkin argues that "competence" is most important to voters because it is most predictive of performance, others (e.g., Page, 1978) include warmth, activity, strength, and honesty as traits of instrumental significance to voters. More recently, Kinder (1986) has identified four traits -- competence, integrity, leadership (strength or determination), and empathy -- that voters attribute to candidates and which predict voters' overall evaluations of them.

In Popkin's investment theory of trait attribution, for example, voters combine free information (which is acquired as a byproduct of other activities) with other relatively cheap information to make politically relevant trait attributions. Popkin argues that it is easier for voters to infer traits from such evidence than to calculate the effects of the candidate's party affiliation and issue position on his/her future behavior in office. Other analyses of political cognition reach similar conclusions by viewing the voter as a "cognitive miser" seeking political information at a minimal cost (Lau, et al., 1988; Aldrich, et al., 1988).

While this explanation is reasonable, it leaves a critical question unanswered. Although emotional responses and trait

attributions have been shown to be important determinants of voting decisions (Kinder & Abelson, 1981; Abelson, Kinder, Peters, and Fiske, 1982; Kagay and Caldiera, 1975), surprisingly little is known about how a political leader's verbal and nonverbal behavior evoke them (McGuire, 1985: esp. pp. 276-85). If voters seek easily interpretable cues when watching a leader on television, it is plausible to assume that they will attend to nonverbal behavior. Among these cues, it is likely that facial displays will be salient since they are frequently shown in television coverage of leaders (Masters, et al., 1987) and transmit emotion and signal social status in all human cultures as well as among nonhuman primates (Ekman and Oster, 1979; Plutchik, 1980; van Hooff, 1969).

It is particularly important to focus on such cues because they provide an instance of the way episodic experience can be translated into lasting feelings and attitudes about politics. The conventional studies of public opinion, particularly when using polling techniques, can only assess the residue of prior experience. In contrast, studies of the way the media influence actual campaigns (e.g., Orren and Polsby, 1989) emphasize the importance of specific events which seem to have disproportionate effects on the electorate. Since cognitive neuroscientists have emphasized the importance of episodic memory in the formation of lasting associative learning, emotion, and attitude (Squire, 1987; Mishkin and Appenzeller, 1987, and Appendix I), it is essential that studies of the political effects of media coverage include some direct analysis of the viewers' experience when watching leaders on television.

In a series of experiments carried out from 1982 through 1989, we have explored how a leader's facial displays seen on television affect viewers' impressions, emotions, and political attitudes. Our theoretical approach combines the perspectives of ethology and social psychology with current work on the role of impressions and emotions in shaping political attitudes. Ethological theory emphasizes the importance of facial displays

signalling attack, flight, or submission in regulating status and power relationships in primates (van Hooff, 1969; Hinde, 1982; Chance, 1989). Human facial displays corresponding to these functional categories --happiness/reassurance (H/R), anger/threat (A/T), and fear/evasion (F/E) -- were chosen for research according to criteria summarized in Table 1 (Masters, et al., 1986). Because such displays play a role in social interaction among all human groups, it is hardly surprising that exemplars were plentiful in videotaped archives of national TV coverage of press conferences, party rallies, nominating conventions, and speeches in American politics (Masters, et al., 1987).

Table 1

Criteria for Classifying Facial Displays*

	Anger/ Threat (A/T)	Fear/ Evasion (F/E)	Happiness/ Reassurance(H/R)
<u>Eyelids:</u>	Opened Wide	Upper Raised/ Lower Tightened	Wide, Normal or Slightly Closed
<u>Eyebrows:</u>	Lowered	Lowered and Furrowed	Raised
<u>Eye Orientation:</u>	Staring	Averted	Focused then cut
<u>Mouth Corners:</u>	Forward or Lowered	Retracted, Normal	Retracted and/or Raised
<u>Teeth Showing:</u>	Lower or none	Variable	Upper or both
<u>Head Motion:</u>			
Lateral	None	Side-to-Side	Side-to-Side
Vertical	None	Up-Down	Up-Down
<u>Head Orientation:</u>			
To body	Forward from Trunk	Turned from Vertical	Normal to Trunk
Angle to Vertical	Down	Down	Up

*Source: Masters, Sullivan, Lanzetta, McHugo, and Englis, 1986: Table 2.

We hypothesize that such facial displays are among the meaningful stimuli that can be determinants of viewers' trait attributions and emotional reactions to leaders. Both within cultures and across cultures, humans accurately decode the emotion that a specific, expressive facial cue represents (Ekman & Oster, 1979). Because television frequently shows close-up, full face images of politicians who often rely on simple, stereotyped emotional gestures for communicative purposes (Masters, et al.,

1987; Joslyn and Ross, 1986; Frey and Bente, 1989) and viewers interpret their meaning accurately (Masters, et al., 1986; Sullivan & Masters, 1988), it seems reasonable to explore the extent to which this system provides the public with salient and relevant cues about leaders.

In describing displays, ethologists have used Charles Darwin's insight that "antithetical" cues are likely to become salient through the process of natural selection (Darwin, 1872, pp. 50-65). In human happy/reassuring displays, for example, eyebrows are likely to be raised (in contrast to the lowered brows in A/T), body movement to be smooth (in opposition to abrupt movements of flight or attack), and head tilted (as opposed to the rigid and forward motion of the head in signalling attack). In a similar way, it is possible to specify objectively the features of anger/threat or fear/evasion, and to show that they function as "unconditioned stimuli" in responses to others (e.g., Ekman and Oster, 1979; Lanzetta and Orr, 1980; Orr and Lanzetta, 1980).

These three gestures are of special interest because ethological research shows their effects to depend on the power relationships and affective bonds between the emitter and the observer (van Hooff, 1969; Lorenz and Leyhausen 1973; de Waal, 1982). Moreover, the observer's response, in addition to being dependent on the leadership status of the emitter, may feedback in a way that either enhances or weakens the leader's position (Chase, 1982; McGuire and Raleigh, 1986; Raleigh and McGuire, 1986; Carlotti and Masters, 1988).

Our research confirms work in psychology showing that viewers distinguish such displays accurately and respond in emotionally different ways to them (Ekman and Oster, 1979; Masters et al, 1986). Real-time measures of psychophysiological reaction demonstrate that each of the three types of display elicits different affective responses that are congruent with verbal reports of emotion (Vaughan & Lanzetta, 1980; Englis, Vaughan &

Lanzetta, 1982; McHugo, et al, 1985). As a result, the viewer's self-reports of emotion seem to be "real" phenomena (and, indeed, probably not as likely to be influenced by the form and administration of questionnaires as are public opinion polls).

When seeing leaders, viewers react with more positive emotion to happiness/reassurance displays and with more negative emotion -- anger and fear -- to anger/threat or fear/evasion displays (Lanzetta, et al, 1985; Masters, et al., 1986; Sullivan and Masters, 1989a). Similar effects have been found when comparing emotional responses to neutral and H/R displays of all Presidential Candidates in both 1984 (Masters, et al, 1985) and 1988 (Carlotti, 1988; Masters and Carlotti, 1988). Since such emotional responses to leaders' displays, like emotional responses to their policies and outcomes, sometimes shape attitude towards them (Sullivan and Masters, 1988), exactly how does the process work?

A leader's expressive displays of emotion, if repeatedly seen, can modify viewers' attitudes directly by eliciting either emotions (cf. Zajonc, 1982; Sullivan and Masters, 1988) or trait attributions (Abelson, et al. 1982) that affect attitude towards the leader. Although this paper does not explore the issue, the causal path may be more complex. Rather than directly affecting attitudes, facial displays may elicit trait attributions that, in turn, arouse emotions that affect attitudes (cf. Mandler, 1975; Lazarus, 1984). Or, conversely, an observer's emotional responses to a leader's displays may elicit attributions of traits that by a more cognitive process shape attitude towards the leader. (Appendix I).

Theories of political cognition thus need to include nonverbal cues that are capable of eliciting the affective responses known to be implicated in attitude formation and change.⁴ The

⁴It need hardly be added that exploration of the way leader's performance styles influence the public will also contribute to theories of leadership, particularly by filling the gap between scholarly theories (e.g., Barber, 1985; Burns, 1978) and journalistic accounts (e.g., Barnes, 1988; Supplee, 1988; Kalb and Hertzberg, 1988).

variables involved in the process by which facial displays can influence voters are, however, obviously complex. In addition to factors associated with the stimulus (the leader's identity, display behavior, and status as well as the context of the event), attributes of the viewer are known to modify the effects of any persuasive cue (McGuire, 1985; Cacioppo and Petty, 1979). In particular, it is to be expected that the extent to which the viewer has political information and the nature of these prior attitudes will be central determinants of affective and attitudinal responses.

Among the interesting questions that need study is whether these factors influence males and females differently. Men and women are known to process facial displays and other nonverbal cues in different ways (Babchuk, et al., 1985; Hall, 1979, 1987). Other experimental studies in our series have shown that attitude towards the leader combines with the nature of his display to elicit different patterns of emotional response for men and women on the physiological level (McHugo, Lanzetta, and Bush, 1987) as well as when subjects give verbal self-reports of their responses (Masters, 1989b; Masters & Carlotti, 1988). Gender differences in information processing may help to explain puzzling gender effects that have often been found in contemporary politics (Walker, 1988).

Perhaps because such results suggest differences in patterns of information processing, rather than simple attitude effects of the sort traditionally studied in opinion research, this question has not received the careful attention it deserves. Studies in the U.S. show that men and women follow different paths of elite recruitment (Darcy, Welch, and Clark, 1985; Sapiro, 1986) and respond differently to some, but not to all, events in American politics (Poole and Zeigler, 1985; Klein, 1987; Schubert, 1985, 1987). These effects mirror gender differences in social cognition more broadly (Gilligan, 1982; Barchas & Mendoza, 1984; Birke, 1986). Cross-culturally, Almond and Verba (1963) summarized

the gender differences observed by noting that, although women and men often had indistinguishable political attitudes, women did differ "in being somewhat more frequently apathetic, parochial, conservative, and sensitive to personality, emotional, and aesthetic aspects of political life in electoral campaigns." While some of these characteristics of women's attitudes -- most notably conservative ideologies and voting tendencies -- are no longer found in cross-cultural studies, others -- and most notably the importance of personality and the aversion to aggressiveness -- remain significant in France, Germany, Great Britain, and the U. S. (Walker, 1988). Experimental studies of political information processing are promising as a means of clarifying such puzzles.

Experimental Methods

While the studies summarized below were based on the same criteria for stimulus selection, experiments varied in design in order to elucidate different aspects of the system by which nonverbal cues elicit emotional and cognitive responses about leaders. These studies can be classed in four groups: 1) measures of display effects, using exemplars of a single leader such as President Reagan exhibiting all three types of facial display (Masters, et al., 1986; Sullivan, et al., 1989b); 2) measures of psychophysiological responses using similar excerpts while measuring autonomic reactions and activation of facial muscles associated with emotional states (McHugo, et al., 1985; McHugo, Lanzetta, and Bush, 1987); 3) measures of the effectiveness of displays in a more realistic setting, using different displays as silent cues embedded in the background of routine TV news stories (Sullivan, et al., 1984; Sullivan and Masters, 1989a); and 4) measures of differences in the performance of similar display effects by competing leaders, using a neutral and a happy/reassuring display of competing candidates in an election

(Sullivan and Masters, 1988). By using the same excerpts of and for different kinds of subjects, this last design also permitted study of the effects of the political context and status of the leader (Sullivan and Masters, 1989b; Carlotti and Masters, in preparation) as well as of the socio-economic status of viewers. Additional studies have included studies that 1) presented excerpts of Reagan to French viewers (Masters and Mouchon, 1986), 2) replicated features of the first and fourth type of study noted above, showing displays of three French leaders in France (Masters and Sullivan, 1989a, 1989b), 3) used a full Presidential debate between Carter and Ford in 1976 to measure the effect of the instant analysis or TV news commentary on the viewers' perceptions, emotions, and attitudes (Newton, et al., 1987), and 4) assessed cognitive reactions to displays in real-time (Masters and Muzet, in preparation).

In these studies, viewers were told that we were interested in the effects of the media on modern politics: virtually no subjects suspected that the purpose of our experiments was an assessment of facial display behavior.⁵ After a standard pre-test questionnaire, in which viewers were asked to report information and attitudes concerning politics and rival leaders,⁶ videotaped excerpts of leaders were presented; after each segment, subjects were asked to describe the leader they had just seen, using 0-6 scales that have been validated at the psychophysiological level (McHugo, et al., 1985) and elicit similar responses in both France

⁵Since our experimental designs focus on within-subject differences in response to distinct displays (often by the same leader or leaders), or on between-group differences when comparable groups of viewers have an identical viewing experience with one or more experimental modifications, "demand-characteristics" are not likely to be associated with the significant effects reported below. Indeed, one could argue that the experience of watching television news provides a form of "priming" which is rather similar to the experimental setting insofar as the news commentator's introduction and statements "frame" the experience of watching a leader much as did our experimental paradigm.

⁶In the 1988 election study (Carlotti, 1988), viewers also completed the Cloninger TPQ Personality Inventory (Cloninger, 1987).

and the United States (Masters and Mouchon, 1986; Masters and Sullivan, 1989a, 1989b). A post-test questionnaire was then used to assess changes of attitude that might be associated with the viewing experience (for typical questionnaire items, see Sullivan and Masters, 1988: Appendix I).

Stimuli were selected according to the objective criteria outlined in Table 1 and defined more completely elsewhere (Masters, et al., 1986). For each leader being studied in an experiment, videotapes of routine television coverage were searched for the best available excerpt showing each type of display. After selection by one researcher, other observers recoded proposed excerpts using the same selection criteria; displays with discrepant ratings were dropped from the study.⁷ While displays obviously varied not only in intensity but in homogeneity, viewer ratings of the type of display in both the U.S. and France (see variable #1 below) confirm the accuracy of these selection procedures.

Although the experimental stimuli were sometimes shown to single viewers, notably in the studies of psychophysiological response, excerpts were usually presented to small groups of subjects who were instructed not to express their responses openly.⁸ The channel of communication or "media condition" was also controlled: in studies of the first type described above,

⁷In some cases, as in the experiments using displays of all candidates during the 1984 and 1988 election, it was extremely difficult to find good exemplars of happy/reassuring displays for some leaders. In the 1988 study, some candidates (Dupont, Kemp, Gore, Simon) were included in the design with a single, "mixed" excerpt in which no single type of display predominated (Carlotti, 1988: Table 6). And, of course, differences in display intensity and homogeneity are one of the factors underlying differences in the political effectiveness of nonverbal behavior, since some leaders are more likely to than others show elements of tension or fear in their happy/reassuring facial displays (e.g., Suplee, 1988).

⁸Since citizens normally watch television with others, this aspect of the experimental experience does not produce a situation totally unlike the one in which leaders are typically seen in contemporary societies.

comparable groups saw identical displays with the sound-plus-image, image-only, sound-only -- and, in one case, with filtered sound plus image and written text only (Masters, et al., 1986; Masters and Sullivan, 1989a, 1989b), while in the fourth or multi-candidate type of experiment, the same excerpts were seen by half of each sample with image-only and the other half with sound-plus-image (Sullivan and Masters, 1988, 1989b). Political context was measured by repeating the same experimental paradigm using similar subjects at different moments in the election campaign (Sullivan and Masters, 1988, 1989b; Carlotti and Masters, in preparation); similarly, socio-economic background was measured by simultaneously presenting the same stimuli to samples with different class and economic backgrounds.

This line of research has thus enabled us to explore the complexity of the system of nonverbal communication and the diverse ways in which emotion and cognition interact under realistic circumstances. Our studies show that a large number of factors or variables are involved in the communicative process by which the facial displays and other nonverbal cues of leaders influence the viewer. Here we summarize the effects found in our studies, indicating how each variable was measured, illustrative results, and explanatory hypotheses that might account for the findings.

Factors Influencing the Effects of Nonverbal Displays of Leaders

A. Principal Variables: Leaders' Displays, Viewer's Emotions, and Post-test Attitudes

1. **Type of Display:** Experiments have focused on four types of facial display, using videotaped excerpts of political leaders exhibiting "happiness/reassurance" (H/R), "anger/threat" (A/T), "fear/evasion" (F/E) and neutral (N) display behavior.

a. Measurement of independent variable: excerpts were selected and verified according to objective criteria (see Table 1 and methods section above).

b. Principal effects found: viewers recognize and discriminate each type of display -- and each type of display elicits different patterns of psychophysiological and self-reported emotional response.

When viewers have seen the same leader exhibiting more than one type of display, descriptive scores of the leader's behavior in each excerpt (on 0-6 scales) show that the scale score congruent to the display as objectively defined ("happy" for H/R; "angry" for A/T, "fearful" for F/E) is always rated higher than other descriptive scales (Masters, et al., 1986; Masters and Sullivan, 1989a). This was true for American viewers' descriptions of H/R, A/T, and F/E displays of President Reagan in five different media conditions (Masters, et al., 1986: Figure 1a-b), as well as of descriptions of H/R and N displays of candidates in the 1984 and 1988 elections (Sullivan and Masters, 1988; Carlotti and Masters, in preparation), and was confirmed for French viewers' responses to the same displays of Reagan (Masters and Mouchon, 1986: 85-86) as well as for descriptions of H/R, A/T, and F/E displays of three French leaders (Masters and Sullivan, 1989a: Figure 1).

Because a single verbal scale score may not be the best measure of decoding, descriptive ratings were factor analyzed. Descriptive scores reflect two bipolar factors, one for reassurance (joyful vs. angry) and the other for dominance (strong vs. confused or weak); here again, factor weights are highly similar in France and the U.S. (Masters and Sullivan, 1989b: Table 1 and Figures 1a-b).

⁹Although two factors emerged from a factor analysis retaining factors with eigenvalues greater than 1.0, an additional factor analysis retaining factors with eigen values

Hence, the descriptive ratings of leaders' nonverbal display behavior shows similar patterns in two different cultures. Finally, a "centroid" cluster analysis of viewers' descriptions confirmed that verbal labels are used to decode nonverbal displays accurately (Masters, et al., 1986: Table 6), thereby indicating that viewers do indeed discriminate reliably between different behavioral episodes and use verbal labels consistently when perceiving different nonverbal displays (cf. Ekman and Oster, 1979).

While viewers' descriptions of a leader's behavior correspond to the type of display as objectively defined, experiments also show that viewers' attitudes towards the leader can influence their descriptions of his displays (Masters and Sullivan, 1989b: Table 2). Although there was no significant effect of prior attitude on descriptive ratings when viewers saw only H/R, A/T, and F/E excerpts of Reagan (Masters, et al., 1986: 12), prior attitude sometimes did influence the level of descriptive scores when the study showed rivals during a Presidential campaign (Sullivan and Masters, 1989a: Table 2a-c). In general, such effects are more likely in a competitive context (Masters and Sullivan, 1989a: 6; Flohr, Tönnesman, and Pöhls, 1986; Masters and Muzet, in preparation). Despite this qualification, however, descriptive scores are at least partially independent of verbal self-reports of emotion or of prior attitude toward the leader.

As will be shown below, viewer perceptions of differences in display behavior affect their emotional responses; they respond with higher levels of emotion to displays judged to be more intense; this is true both for psychophysiological responses

greater than .80 resulted in three factors which were remarkably similar in composition across media conditions. In several of our early papers (Lanzetta, et al., 1985: Table 4.2; Masters, et al., 1986: Figure 2), the three factors were labelled happiness/reassurance, anger/threat and fear/evasion. When a comparable factor analysis was done for the descriptive scale scores of French subjects, three similar factors emerged (Masters and Sullivan, 1989a: Figure 2).

(McHugo, Lanzetta, and Bush, 1987) and for verbal self-reports. Moreover, emotional responses to the different displays (H/R, A/T, and F/E) affect viewers' attitudes towards the leader expressing the emotion (Sullivan and Masters, 1988, 1989a, 1989b; Carlotti and Masters, 1989). In the United States, emotional responses are more positive after seeing H/R than after either A/T or F/E displays (Sullivan and Masters, 1989b: Figures 2a-c), whereas in France there is little difference between the effects of H/R or A/T displays (Masters and Sullivan, 1989a: Figure 4a-b).

c. Explanatory hypothesis. Facial displays and other nonverbal cues form an evolved communicative system of high salience in human social behavior as well as in the relations of nonhuman primates (Ekman and Oster, 1979; van Hooff, 1969, 1973; Frank, 1988; MacDonald, 1988; Masters, 1989a).

2. Type of Emotional Response: Verbal self-reports of emotion have been measured immediately after watching excerpts and compared to psychophysiological responses during the viewing experience; these responses tend to form two distinct dimensions, one "hedonic" (positive or *pleasurable*) and the other "agonic" (negative or *competitive*).

a. Measurement of dependent variable: differences in viewer's self-report of emotion (as rated on 0-6 scales anchored by triads of affect terms) as well as psychophysiological responses (facial EMG at zygomatic and corrugator, heart rate, and skin conductance) during presentation of stimuli. In the first studies (e.g., Masters, et al., 1986; Masters and Sullivan, 1989a, 1989b), verbal self-report of emotion was recorded on eight different scales ("inspired," "joyful," "comforted," "interested," "angry," "disgusted," "fearful," "confused"); subsequent studies presenting large numbers of displays (Sullivan and Masters, 1988; Carlotti, 1988; Sullivan and Masters, 1989b) employed only four principal scales ("joyful," "comforted," "angry," and "fearful").

b. Principal effects found: viewers' verbal self-reports of emotion during each excerpt correspond with psychophysiological responses known to be associated with emotional experience, reflecting similar hedonic and agonic dimensions of emotion in France and U.S.

While watching H/R, A/T, and F/E displays, viewer's facial muscle changes corresponded to the emotion expressed and were consistent with the verbal self-reports of subjective feelings (see Figure 1). Although viewer's psychophysiological responses to Reagan did not depend on their prior attitude toward him, attitude did have such an effect both on self-reported emotions in this study (McHugo, et al, 1985: Figure 3) and on the same psychophysiological measures in a follow-up study with two competing politicians (Reagan and Hart) as stimulus figures (McHugo, Lanzetta, and Bush, 1987). The latter study also confirmed that displays objectively defined as more intense elicited stronger psychophysiological responses .

FIGURE 1 (= McHugo, et al., 1985: Figure 4) ABOUT HERE

Factor analysis of the verbal self-reports of emotional response showed that, in both France and the United States, viewers use verbal labels to map the same two dimensions of emotion, one "hedonic" or positive and the other "agonic" or negative (Masters, et al., 1986; Masters and Sullivan, 1989a; see Figure 2). These dimensions correspond to those found in primate social behavior generally (Chance, 1976, 1989) as well as in social psychology and political science (Abelson, et al., 1982; Marcus, 1988). In fact, the pattern of factor loadings found in our studies is almost identical to the results when analyzing public opinion poll data recording voters' feelings when thinking about political leaders (Masters, et al., 1986: Figure 7). Episodic responses to nonverbal cues can therefore be reliably measured by verbal self-reports of emotion -- and these reports track actually felt affective responses.

FIGURE 2 (= Masters and Sullivan, 1989a: Figure 3) ABOUT
HERE

c. Explanatory hypothesis. The nonverbal displays that have evolved as social signals elicit emotional responses by activating distinct structures in the central nervous system, including sites in the inferior temporal lobes and limbic system which play a central role in associative learning and memory (Kling, 1986, 1987; Mishkin and Appenzeller, 1987; Rolls, 1989a, 1989b; Appendix I); in this system, there are distinct neurological pathways underlying hedonic (positive) and agonic (negative) emotional responses that can be described as a reward system and a "behavioral inhibition" system (Marcus, 1988; Grey, 1982; Cloninger, 1987; MacDonald, 1988).

3. Post-test attitude to Leader. Attitudes of viewers after seeing leaders were measured to see whether the viewing experience, the displays exhibited by a leader, or the performance style of different leaders might produce opinion changes.

a. Measurement of variable. Measurement of attitude on the widely-used 0-100 thermometer scale was obtained at the end of some experimental sessions; in one study, this post-test assessment of attitude was delayed until 24 hours after the last excerpts to provide an indication of potentially lasting attitude changes.

b. Principal effects found: Episodic emotions during the viewing experience contribute to potentially lasting attitude changes due to the viewing experience; male viewers with neutral attitudes were most likely to change opinions due to silent nonverbal displays in TV newscasts.

The effects of episodic emotions felt during and immediately after the viewing experience can play an important role in attitude

changes (McGuire, 1985). The mere experience of viewing rival candidates has short-term effects on attitudes; while seeing some leaders shifts both critics and supporters to more positive opinions, the sight of others may polarize previously neutral attitudes or actually reduce the strength of their own support. In January 1984, before the New Hampshire primary, the experience of viewing Reagan's excerpts reduced the number of critics while attracting a higher proportion of supporters whereas seeing Mondale turned off his own supporters and increased his critics (Lanzetta, et al., 1985: Table 4.4); at a comparable stage in the 1988 campaign, seeing excerpts of all the candidates increased the number of those favorable to Jesse Jackson -- and to a lesser extent Hart and Reagan -- whereas both Bush and Dukakis had fewer supporters and more critics after the experience than before (Carlotti, 1988: Table 9).¹⁰

Episodic emotional responses to displays, and especially to H/R excerpts, often contribute to these changes in attitude. For example, regression of post-test attitude towards each candidate on the independent variables -- pre-test attitude, self-reported net warmth (positive minus negative emotion) after seeing a H/R and after seeing a neutral display, party identification, issue agreement and assessed leadership ability -- shows that the emotions elicited by H/R excerpts contributed significantly to post-test attitude towards each candidate for all Democrats in 1984 except Mondale, Hollings, and -- in October 1984 but not January of that year -- Glenn (see Table 2). Comparing responses of samples at the beginning and end of the 1984 campaign, moreover, the effect of emotional responses to Reagan's H/R display almost doubled from January to October whereas the comparable responses to Mondale remained low in both studies (Sullivan and Masters, 1988: Figure 2).

¹⁰In contrast, when an adult sample saw the same excerpts of Dukakis and Bush after the Democratic Convention in July, although viewers again responded with a shift away from Bush, females in this study shifted toward Dukakis after the viewing experience (Masters and Carlotti, 1988: Figure 3a-b). For such effects, see Variable #14 below.

TABLE 2 (= Sullivan and Masters, 1988: Table 4) ABOUT HERE

Replication of this experimental design in the 1988 Presidential campaign revealed similar effects of episodic emotional responses for some but not all candidates. Before the 1988 New Hampshire primary, for example, emotional responses to H/R excerpts of Hart and Jackson had significant effects on post-test attitudes, whereas emotions felt during similar excerpts of either Bush or Dukakis did not have such effects (Sullivan and Masters, 1989b: Table 6 and Appendix I). In November 1988, just before the election, the same H/R excerpt of Hart did not have this effect, suggesting that loss of status or power reduces the impact of the emotions felt while seeing a leader; similarly, an excerpt of Reagan which had been highly evocative in 1984 failed to have similar results in both 1988 samples (Sullivan and Masters, 1989b: Table 6 and Appendix I).

Different types of viewers do not seem to respond to the viewing experience in the same way. Since the foregoing studies were done with comparable samples from the same Ivy League College, in November 1988 the same videotapes were shown to a sample of black students at Grambling State University as well as to students at Boston University. Not only did the non-Ivy League students often report quite different emotional responses after these excerpts, but effects of emotion on post-test attitude were not the same in each sample (see Variable #13 below). While the complicated interaction between cognition and emotion produces different effects on attitude depending on circumstances, however, episodic viewing experiences have modified attitudes to some leaders after all of our studies.

To assess whether the post-test attitude changes attributable to nonverbal displays could be more lasting, attitudes toward President Reagan were measured twenty-four hours after the second day of the study in which silent excerpts of Reagan

**Influence of Viewers' Pre-Test Attitudes and Emotional Responses on
their Post-Test Attitudes at Outset and Conclusion of Campaign***

Pre-Primary Sample (February 1988)

Candidate	Pre-test Attitude	Pre-test Emotional Response to:		Party Identi- fication	Issue Agree- ment	Assessed Leadership Ability	R ²	
		Happy/ Reassuring Display	Neutral Display					
Reagan	88'	<u>.48</u>	.67	.79	-1.50	3.14	1.39	.75
Bush	88'	.53	-.19	<u>1.02</u>	-1.30	<u>3.51</u>	2.22	.75
Dukakis	88'	<u>.49</u>	.16	-.45	<u>-3.40</u>	<u>-4.90</u>	3.00	.35
Hart	88'	<u>.57</u>	.41	.55	<u>2.06</u>	.26	<u>5.74</u>	.79
Jackson	88'	<u>.58</u>	<u>1.29</u>	.27	-1.73	<u>3.26</u>	-.64	.79

Pre-Election Sample (November 1988)

Reagan	88'	<u>.32</u>	.08	<u>1.08</u>	.57	<u>3.94</u>	<u>2.91</u>	.86
Bush	88'	<u>.46</u>	.36	.34	-.51	<u>4.16</u>	.87	.76
Dukakis	88'	<u>.48</u>	.65	.81	1.29	2.86	<u>2.80</u>	.83
Hart	88'	<u>.31</u>	.36	<u>1.55</u>	.80	<u>7.31</u>	.04	.59
Jackson	88'							

*Multiple regression analysis of post-test attitude to each candidate on 0-100 "Thermometer" scale, combining responses to sound-plus-image and image only presentation of displays. Relative weight of pre-test attitudes and emotional responses measured by unstandardized partial regression coefficients. Statistically significant coefficients ($p < .05$) underlined. Independent variables: pre-test attitude (0-100 scale), "net warmth" of emotional response (joy plus comfort, minus anger plus fear) to each type of display, strength of self-reported party identification, issue agreement with leader, and assessment of candidate's leadership ability (on 0-6 scales).

exhibiting H/R, A/T or neutral facial displays were embedded in the background of routine newscast stories (Sullivan and Masters, 1989a; Lanzetta, et al., 1985). For one category of viewers -- males with neutral attitudes toward the President -- displays had a significant effect on post-test thermometer scores (Sullivan and Masters, 1989a: Figures 3a-b; Lanzetta, et al., Figure 4.5).

c. Explanatory hypothesis. Although the emotional component of an attitude is, by definition, stable, it is not impervious to on-going experiences (Abelson, et al., 1982; Marcus, 1988). Episodic emotional experiences can modify the feelings associated with a leader and thus result in attitude change; to be lasting, such episodic changes need to be reinforced and, of course, this process is sensitive to many contextual and cognitive variables (Sullivan and Masters, 1989a; Newton, et al., 1987; Carlotti and Masters, 1989).¹¹

B. Variables Associated with Stimulus Presented on Television

4. Channel of Communication: Excerpts showing the types of nonverbal behavior studied (H/R, A/T, F/E or N) were presented using different channels of communication to ascertain whether the presence or absence of sound accompanying the visual image of a leader can have significant effects on the viewers' emotional responses and attitudes.

a. Measurement of dependent variable: descriptive ratings and verbal self-reports of emotion were obtained immediately after the presentation of a given excerpt of a leader in five different media conditions (sound-plus-image, image-only, sound-only --

¹¹This proposition is consistent with both evidence in social psychology (Bower, 1981; Bower and Gilligan, 1982) and the neuroanatomical finding that associative learning generally entails activation of the limbic system, which controls emotional response in mammals (Mishkin and Appenzeller, 1987).

and, in one study, also filtered-sound-plus-image, and text-only) while psychophysiological responses and attitude changes were recorded from subjects who saw excerpts in sound-plus-image or image-only condition. Some studies employ within-subject comparisons (McHugo, et al., 1985; Sullivan and Masters, 1988), others use between-subject comparisons (Masters, et al., 1986; Masters and Sullivan, 1989a; Carlotti, 1988).¹²

b. Principal effects found: in different media conditions, each type of display is discriminated from others, but the channel of communication influences the level of response elicited: in general, image-only presentations elicit stronger hedonic responses to H/R displays than those accompanied by sound.

When the same displays of President Reagan were shown to viewers all five media conditions (sound-plus-image, image-only, sound-only, filtered-sound-plus-image, and text-only), we found the same patterns of descriptive scores (Masters, et al., 1986: Figure 1 and Table 4) and of emotional responses (Masters, et al., 1986: Table 5) regardless of channel. While other studies confirm that similar display effects occur in different media conditions (e.g., Sullivan and Masters, 1988: Table 3), however, responses do vary in intensity and significance when a leader is seen without being heard (image only) or can be heard and seen at the same time.¹³

¹²The filtered-sound and transcript media condition were only included in one of the preliminary experiments in the United States (Masters, et al., 1986; Sullivan, et al, in press). Cross-cultural comparisons between American and French viewers were restricted to sound-plus-image, image-only, and sound-only media conditions (Masters and Sullivan, 1989a, 1989b). Because the French replication presented three leaders, it also differed slightly in design: in the comparable American experiments media condition was a between-subjects factor (Masters, et al., 1986), while in the French experiments it was a within-subjects factor (Masters and Sullivan, 1989a, 1989b).

¹³This difference has considerable practical importance because television newscasts often show images of leaders without accompanying sound. In a cross-cultural study of nightly TV news in France, Germany, and the U.S., a large proportion of these excerpts were found to be brief "visual quotes" (< 6 seconds) communicating an image without sound (Frey and Bente, 1989; Masters, Frey, and Bente, in preparation).

When psychophysiological responses of emotion were measured, the display effects produced by H/R, A/T, and F/E excerpts of Reagan were stronger during image-only presentations than when the excerpts were shown with sound-plus-image; this difference was especially marked for the facial muscles of the mouth and brows known to correlated with feelings of happiness and anger (Lanzetta, et al., 1985: Figure 4.4; Masters, et al., 1986: Figure 3). In particular, higher levels of positive affect were transmitted by H/R displays in the image-only condition, during which the zygomatic muscles associated with smiling were activated more strongly -- and the corrugator muscles associated with both attentional focusing and anger were less activated, than during sound-plus-image presentations. The sound channel also seems to elicit stronger agonic responses than image-only presentations, perhaps because heart rate is increased by A/T and F/E excerpts when the sound is present but not when viewers see the image only condition (Lanzetta, et al., 1985: Figure 4.4).¹⁴

The effects of different kinds of displays on attitude, to be discussed further below, may sometimes be influenced by media condition. When viewers watched all candidates during the 1984 American Presidential campaign, the H/R excerpts of most leaders presented with sound-plus-image had a significant effect on post-test attitudes, whereas for two candidates -- McGovern and Hollings -- this effect did not occur in image-only presentations of the same excerpts (Sullivan and Masters, 1988: Table 3). Such effects of the channel of communication may, however, also be mediated by the gender of the viewer, since males seem more likely

¹⁴The results of early exploratory studies show higher levels of self-reported levels of hedonic responses to image-only excerpts as contrasted with higher levels of agonic response to sound-plus-image presentations (unpublished).

to be sensitive to independent effects of the media condition than females. ¹⁵

Explanatory hypothesis: cognitive processing of the information contained in the verbal message presumably dampens the effectiveness of visual images of facial displays, so that image-only presentations would have stronger display effects than the same excerpts presented with both sound and image.¹⁶

5. Performance style of leader: excerpts showed individual leaders whose displays were perceived as varying in their expressive intensity, in their facial configurations, and in their tendency to exhibit mixed vs. homogeneous and smooth nonverbal displays.

a. Measurement of independent variable: display style that varied "naturally" in TV coverage of different leaders was measured by the intensity and homogeneity of descriptive ratings of the excerpt in image-only media condition; effects were then measured by analyzing within-subject differences in emotional responses to excerpts of different leaders in same experimental setting.

¹⁵This possibility appeared in an exploratory, post-hoc analysis, in which scale scores for each emotional response were regressed on attitude toward the leader or party identification, description of the display, and media condition (using dummy variables for presence or absence of either sound or image and sound-plus-image); controlling for the measures of attitude and for the viewer's descriptions of the display, media condition was less likely to influence females than males (Masters, 1989b: Figures 3-4). There is, however, further evidence of gender differences in responses to leaders in different media conditions (Carlotti, 1988: 89, 91, 128, 131, 134) as well as experimental evidence from other contexts suggesting that this finding is plausible (Barchas and Mendoza, 1984).

¹⁶These effects presumably reflect the two major neuroanatomical pathways linking the visual and auditory cortex with the limbic system, since the medial pathway through the inferior temporal lobes to the amygdala is less likely to be mediated by verbal information than the dorsal pathway through the cortex (Mishkin and Appenzeller, 1979; Rolls, 1989a, 1989b; Appendix I).

b. Principal effects found: displays perceived as a mixture of distinct cues elicit weaker emotion, are less likely to activate prior opinions favorable to the leader, and produce less favorable attitude change.

In general, the homogeneity of a viewer's descriptive rating of a display, measured as the ratio of hedonic to agonistic cues, predicts self-reported emotional response (Masters, 1989b: Figures 3-4). In the first studies of President Reagan, viewers saw three exemplars of each type of display behavior (Masters, et al., 1986; Carlotti, 1988: 54-55); within each type of display, excerpts that were perceived as more heterogeneous either in the facial display behavior or in contradictions between vocal and visual cues elicited weaker emotional responses (unpublished results). Where viewers saw more than one leader, an individual whose display was described as more heterogeneous was less likely to elicit emotional responses that interacted with viewers' prior partisanship or attitude (Masters and Sullivan, 1989a: Table 1). In studies showing all candidates during the 1984 and 1988 elections, those leaders whose display behavior was described as more heterogeneous were less likely to elicit warm emotional responses and were less likely to be judged more favorably after the viewing experience (cf. Masters, et al., 1985: Table 2 with Sullivan and Masters, 1988: Table 3; Masters and Carlotti, 1988: 18-22).

c. Explanatory hypothesis. Mixed cues transmit the leader's lack of self-confidence and reassurance, attributes which are essential to continued support of a leader among nonhuman primates as well as in human groups (de Waal, 1982; Masters, 1989a: Chap. 2); such differences may contribute to perceived differences in the "warmth" or effectiveness of individual leaders (Barnes, 1988; Kalb and Hertzberg, 1988; Suplee, 1988).

6. Intensity of display: differences in the intensity of the nonverbal cues, controlling for differences between leaders'

presentational styles, were assessed to determine effects of cue intensity on emotional response.

a. Measurement of variables: within-subject differences in psychophysiological responses and verbal self-reports of emotion were obtained after viewers watched different displays by the same leaders. In studies where verbal reports were recorded, an entire sample's average descriptive rating of two displays of the same leader was also used to measure intensity of an H/R excerpt; in this measure, the neutral excerpt of each leader serves as a baseline, and the intensity of the H/R display is its difference from descriptions of the neutral display (using average "net description" ratings of "strong" plus "happy" minus "angry" and "afraid" for each excerpt).

b. Principal effects found: higher intensity H/R displays elicit stronger psychophysiological responses, and the greater the difference between descriptions of the leader's neutral and his H/R display, the more that leader's H/R excerpt enhances viewers' emotional responses.

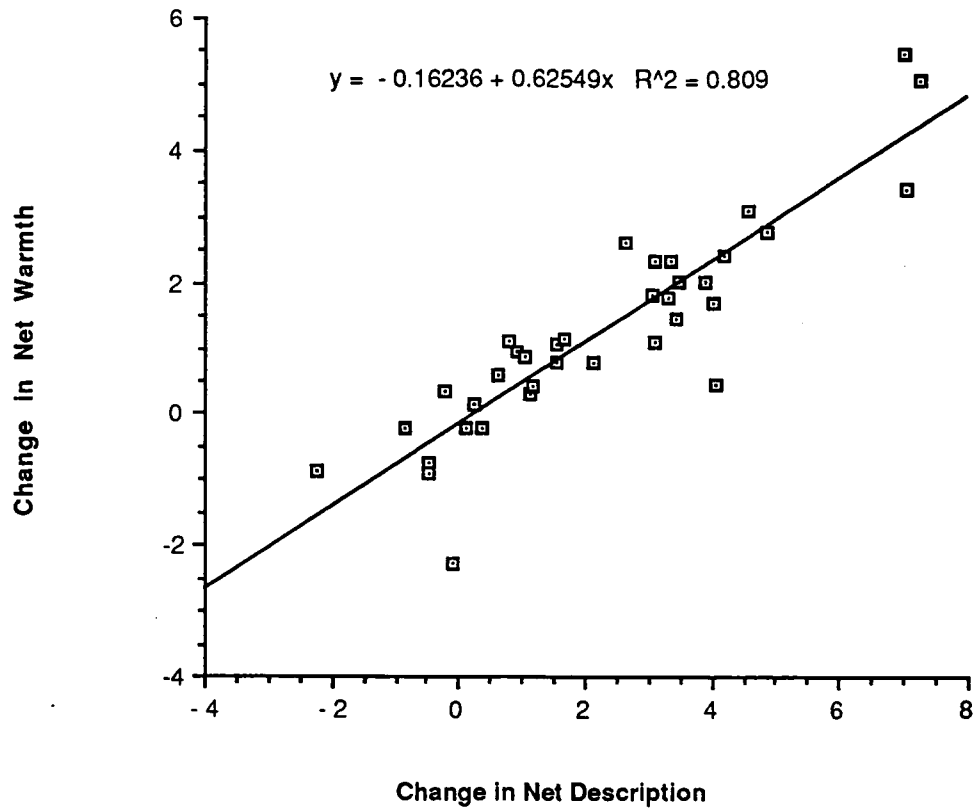
When viewers were shown a low intensity and a high intensity H/R excerpt of two leaders (Reagan and Hart), psychophysiological measures of affective response were significantly stronger during the more intense display (McHugo, Bush, & Lanzetta, 1987). In the 1984 Presidential campaign, there was a strong correlation ($r^2 = .95$) between a sample's average descriptive rating of the intensity of a candidate's joy in the H/R excerpt and the average self-reported emotion of happiness (Sullivan and Masters, 1988: Figure 1). Similar -- albeit slightly lower -- correlations were found if each sample's average "net positive description" (ratings of "strong" plus "happy," minus ratings of "angry" plus "afraid") of each candidate's H/R excerpt was correlated with the average "net warmth" of emotional response (feelings of "happiness" plus "comfort," minus feelings of "anger" plus "fear") to the same excerpt (unpublished data).

These effects might be due to positive emotions elicited by favorable attitudes toward the candidate and his party, or by a leader's facial conformation and performance style, rather than being produced by the display behavior itself. To control for the emotion aroused merely by seeing a candidate, the neutral display of each leader was used as a base-line to which descriptive ratings and emotional responses to the H/R excerpt of the same leader could be compared. Across several studies, the intensity of the H/R excerpt was measured by the *difference* between average "net positive descriptions" of the neutral and the H/R excerpt of each leader; these intensity ratings were then correlated with the *difference* in net warmth of emotional response to the same two displays, thereby providing a measure of the enhanced emotion attributable to the H/R display while controlling for variables associated with the candidate and the subjects. Since individual descriptive scores do not always correlate with corresponding emotional response ratings (e.g., descriptions of candidate happiness and the viewer's self-reported emotions of happiness or joy), this measure provides a more accurate summary of effects due solely to display intensity. Across 35 different leaders in five studies, there is again a high correlation ($r^2 = .81$) between described display intensity and felt emotional response.¹⁷

c. Explanatory hypothesis: since facial displays have evolved as analogical communicative signals (Masters, 1989a: Ch. 2-3), more intense display behavior elicits stronger behavioral responses in observers.

¹⁷That it is necessary to control for effects of cognitive or attitude variables when assessing intensity effects was confirmed by closer examination of excerpt by excerpt correlations between descriptive and emotional response measures. Although net description is usually strongly correlated with net emotional response to a single type of display, whether N or H/R, there are individual cases of counter-empathy in response, in which greater "positive" description elicits more negative emotion (e.g., to Pat Robertson or Gary Hart in a February 1989 sample at Dartmouth College). Controlling for prior attitude by looking at difference scores, this effect of attitude on valence of emotion disappears (unpublished results).

Figure 1: Emotional Responses to and Descriptions of Excerpts of Presidential Candidates, 1984 and 1988*



*Change in net warmth (emotional responses of happiness and comfort minus emotional responses of anger and fear) from the neutral to the evocative display compared with change in net description (descriptions of strength and happiness minus descriptions of anger and fear) from the neutral to the evocative display. Difference scores based on means from samples of college students and adults (Sullivan and Masters, 1988a; Carlotti, 1988; Carlotti, et. al., in preparation) were used as data points.

C. Variables Associated with the Viewer

7. Pre-Test Attitude of Viewer to Individual Leader:

differences in the viewer's prior attitude toward the leader being seen (e.g., generally Positive, Neutral or Negative) were assessed to measure the effect of cognitive predispositions on emotional responses and attitude changes.

a. Measurement of variable: subjects' pre-test rating of each candidate on the widely used 0-100 "thermometer" scale (Sullivan and Masters, 1988); in France, the conventional equivalent, a scale from -50 to +50, was used (Masters and Sullivan, 1989a, 1989b).

b. Principal effects found: although prior attitude generally influences emotional responses to excerpts of leaders, these effects often depend on the type of display seen, the candidate's performance style, the political culture, and other variables implicated in leader-follower interactions.

Although it is hardly surprising that the attitudes or prejudices of viewers influence their emotional responses to leaders, the interactions between cognitive and affective factors are extremely complex. In some studies, even descriptions of the excerpts are influenced by prior attitude, with supporters describing given excerpts as exhibiting more strength and warmth, and critics seeing more anger and fear (Masters and Sullivan, 1989a: 6; Newton, et al., 1987; Masters and Muzet, in preparation). Emotional response is even more sensitive to the viewer's prior attitude to a specific leader, but these effects of attitude on emotion interact with the kind of display seen, the performance style of the leader, the context of the viewing experience, and characteristics of the viewer such as the socio-economic status, political culture, or gender.

In general, of course, supporters respond to a leader with more positive emotion and less negative emotion -- and hence greater affective "net warmth" -- than do critics or neutral viewers. But supporters usually report stronger positive feelings and weaker negative ones after seeing a leader exhibiting H/R displays than after his F/E excerpts (Lanzetta, et al., 1985: Figure 4.2; Masters and Sullivan, 1989b: Figures 2a-b and 3a-b); A/T is intermediary, being more likely to resemble F/E displays for American viewers whereas in France A/T does not generally differ from H/R in its effects on supporters and critics (Masters and Sullivan, 1989a: Figure 4a-b; Masters and Sullivan, 1989b: Table 5). As a result, there are often statistically significant interactions between prior attitude and display as determinants of episodic emotional responses to leaders (Sullivan and Masters, 1989a).

In many contexts, critics seem less sensitive to differences in display behavior than do supporters (Lanzetta, et al., 1985: Figure 4.2; McHugo, et al., 1985: Figure 3; Masters and Sullivan, 1989a: Figures 4a-b), but individual leaders may differ in the effects of their displays on supporters and critics. In the French study just cited, for example, viewers' emotional responses to image-only excerpts of Chirac were influenced by prior attitudes with little significant effect of his display behavior, especially on positive emotional responses, whereas prior attitude toward Fabius interacted with his displays in shaping viewers' emotions (Masters and Sullivan, 1989a: 14-15; Masters and Sullivan, 1989b: Table 5 and Figures 2-3). Finally, for some candidates who are not well known -- like Cranston and Askew in January of the 1984 American Presidential campaign -- prior attitude to the individual is not a significant predictor of emotional responses to the displays; three weeks before the election, however, pre-test attitude had also become a significant predictor for these candidates (Sullivan and Masters, 1988: Table 4).

The effects of prior attitude on emotion (and on post-test attitude) can, however, be mediated by a number of situational and

personal factors. These include such diverse factors as: i) mode of producing television newscasts, since silent displays in the background of newscasts can influence neutral viewers whereas they are less likely to influence those with strong attitudes to a leader (Sullivan and Masters, 1989b; Lanzetta, et al., 1985: Figure 4.5); ii) cueing by TV journalists, since neutral viewers are more likely than supporters to change their perceptions and responses on the basis of commentary accompanying a leader's appearance on television (Newton, et al., 1987; see below, Variable #16); iii) status of leader at the time of the experience, since the interaction of pre-test attitude, display behavior, and emotional response can be strengthened by success during the course of a political campaign (Sullivan and Masters, 1988: Figure 2; see below, Variable #14). As will be noted further below, socio-economic attributes of the viewer (Variable #13) and gender (Variable #9) can also mediate the interactions between prior attitude, display behavior, and emotional response (cf. Carlotti, 1988: 82, 89, 91, 128, 131, 134).

c. Explanatory hypothesis. Because of the saliency of nonverbal cues like facial displays in the social interaction of primates and humans (van Hooff, 1969, 1973; de Waal, 1982; E. man and Oster, 1979), it is to be expected that cognition and emotion will interact in complex ways when followers watch and respond to powerful leaders; simplistic or rigidly determined response patterns would contradict the human capacity to shape social strategies in varied ways, depending on the individual's prior experience, status, and goals (Masters, 1989a).

8. Attitude of Viewer to Political Party, Ideology, or Issues. Opinions about politics, and especially the viewer's self-identification with a political party or an ideological perspective, were measured to see whether they are associated with emotional responses to leaders as well as to assess the effectiveness of different leaders in activating the political cognitions of their followers.

a. Measurement of variables: Responses on pre-test questionnaire items for party identification, ideology, issue agreement with the leader, and other political variables were measured by 0-6 on five point Likert scales.

b. Principal effects found: although general political attitudes influence responses to leaders, the effects of the viewer's partisanship or ideology are often weaker than attitudes to the individual leader (especially in the U.S.)

Although it might seem self-evident that political information and commitment have an independent effect on viewers' reactions when seeing leaders, the effects of partisanship and ideology are far from simple. By comparison with attitudes toward the leader being seen, partisanship and ideology are weaker as predictors of either emotional response (Masters, 1989b: Figures 3-4) or of post-test attitude (Sullivan and Masters, 1988: Table 4; Sullivan and Masters, 1989b: Appendix I). In general, however, strong political commitments reduce the tendency of a viewer to be influenced by nonverbal cues or journalistic commentary during the viewing experience; hence neutral and uninformed viewers are probably more likely to change opinions as result of seeing leaders on TV than those with clearly defined attachments to the right or left (Sullivan and Masters, 1989a: Figures 3a-c; Newton, et al., 1987).

The mere fact of partisanship or ideological commitment is thus distinct from effects due to the congruence between the party or ideology of the viewer and of the leader being observed (cf. Variable #11). Some leaders seem far more successful than others in eliciting responses that reflect the viewer's political attachments. During the 1984 campaign, for example, issue agreement -- and, in January, partisanship -- influenced post-test attitudes toward Reagan but not toward Mondale; for comparable samples in February and November 1988, post-test attitudes

toward Bush and Jackson were significantly influenced by issue agreement but not by partisanship, whereas seeing Dukakis elicited post-test attitudes that were affected by both partisanship and issue agreement in February -- and by neither in November (Sullivan and Masters, 1989a: Appendix I).¹⁸ Similarly, partisanship had a greater impact on the emotional responses of French viewers to excerpts of Chirac than of Fabius (Masters and Sullivan, 1989a: Table 1).

c. Explanatory hypothesis. Especially in the television age, political principles and parties have come to be incarnated by the persona of individual leaders; as a result, cognitive factors like partisanship, ideology, or issue agreement can be activated merely by seeing a leader or by responding positively to his nonverbal displays.

9. Gender of Viewer: Because there is increasing interest in gender differences in social cognition and political behavior (Gilligan, 1982; Schubert, 1985, 1987), differences between the responses of male and female viewers were analyzed across a number of studies.

a. Measurement of variable: self-report of gender in pretest questionnaire used as the basis of analysis of gender differences in response.¹⁹

¹⁸Interestingly enough, for both samples at Dartmouth in 1988, partisanship ceased to effect post-test attitudes to Reagan, and issue agreement only influenced attitudes in November, even though the excerpts shown had also been used in the 1984 study (Sullivan and Masters, 1989b: Appendix I). For an explanation of this change in the effectiveness of the same stimulus material, see Variable #14 (leader's status).

¹⁹In the most recent studies, increasing numbers of subjects have failed to enter gender on questionnaires: while possibly due to errors in completing the instrument, it is plausible to assume that some subjects now refuse to answer questions about gender for ideological reasons.

b. Principal effects found: although males and females often differ in the way that they respond to nonverbal cues, the pattern is far from simple: rather than consistent differences in emotional response or attitude, it seems that gender effects are related to the way that males and females process various cues.

Despite the widespread presumption that females are more "sensitive" to nonverbal behavior than males (Hall, 1978, 1987; Babchuck, et al., 1985), this conventional wisdom does not seem to apply when viewers watch leaders on television. When silent excerpts of Reagan were edited into the background of TV news stories, males rather than females were more likely to recall accurately the type of silent displays they had seen (Sullivan, et al., 1984; Lanzetta, et al., 1985: 104-5) and neutral males -- but not females -- expressed post-test attitudes that were significantly influenced by the embedded displays (Sullivan and Masters, 1989a: Figure 3; Lanzetta, et al., 1985: Figure 4.5). In other experiments, it would seem that the viewer's party identification is more likely to influence male's emotions and post-test attitudes, whereas interactions between prior attitude and the display that has been seen are more likely to be significant in female responses (Masters, 1989b: Tables 2-3, Figure 3; Masters and Carlotti, 1988: Figures 1, 4a-b).²⁰ In addition to these effects of the display, however, are differences in the way males' and females' prior attitudes or descriptions of the display relate to emotional responses and attitude changes (Carlotti, 1988: 89, 91, 128, 131, 134).

Several gender differences in processing specific nonverbal cues were also found. Consistent with the general

²⁰When gender is used as a factor in an analysis of variance, along with attitude towards the leader and the nature of display, interactive effects for gender by display and no main effect for gender can be interpreted as a confirmation that males and females are processing cues in a different way. (For a discussion of this method, see Steckler and Rosenthal, 1985). Reanalysis of our studies with this technique found a number of such interactions (Masters and Carlotti, 1988: Tables 1-2).

finding that females are more likely to be risk-averse than males (Masters, 1989b: Figure 2), displays of anger/threat seem generally to be more salient -- and often more aversive -- to females. Gender sometimes has a significant influence on the way a leader's display behavior is described (Plate, 1984), with males being more likely to describe some excerpts as exhibiting high levels of A/T (Carlotti, 1988: 116). After seeing newscasts with silent displays of Reagan in the background, displays influenced immediate emotional responses to the news story differently by gender (Sullivan and Masters, 1989a: Figure 5); in this study, females -- but not males -- were less likely to attribute positive traits to the President if they had actually been exposed to A/T displays than H/R (Sullivan and Masters, 1989b: Table 3). Changes in the status of a leader, as reflected in national opinion polls, also seem to influence the evocative effects of the same videotaped excerpts (see Variable #14) to a greater degree for females than for males (Masters and Carlotti, 1988: Figure 5).

c. Explanatory hypothesis: it would seem that males are more likely to respond to political events in terms of partisanship, ideology, or isolated features of the event observed whereas prior attitude and display are more likely to have interactive effects for women than for men; this difference is consistent with observed characteristics of gender roles and socialization in our society (e.g., Sapiro, 1986) as well as hypothesized tendencies for female social behavior to reflect concrete commitments to specific members of the group to a greater extent than do males (Gilligan, 1982; de Waal, 1984; Masters, 1989b).

10. Personality or Sensitivity of Viewer: since increasing attention has been devoted to the social implications of personality differences that seem to be reflected in different responses to a social situations, the individual viewer's perception of hedonic or agonistic cues in same stimulus were considered as a factor that might contribute to emotional responses.

a. Measurement of variable: differences in hedonic and agonic descriptive ratings of each display as well as the ratio of hedonic to agonic ratings of each excerpt were correlated with viewers' verbal self-reports of emotion.²¹

b. Principal effects found: individual differences in the description of hedonic or agonic cues are correlated with positive and negative emotional responses respectively -- and these individual perceptions are an independent factor in emotional response, controlling for other variables.

An analysis of variance of emotions to joy after watching H/R excerpts of Reagan, Hart, and Mondale in the 1984 Presidential candidate study showed significant effects for prior attitude to the leader and for the tendency to describe the excerpt as exhibiting hedonic or positive cues (happiness and strength), with no effects attributable to the viewer's party identification or sensitivity to agonic cues of anger and fear (Carlotti, 1988: 56-57); a similar analysis of emotions of scorn and anxiety during the same displays shows significant effects of prior attitude (except toward Hart) and descriptions of agonic or negative cues, with no effects attributable to partisanship or description of hedonic cues (Carlotti, 1988: 58-60). In regression models predicting emotional response, the level of hedonic or agonic cues perceived in the display is usually a significant predictor controlling for other variables (Masters, 1989b: Figures 3-4; Carlotti, 1988: 126-28).

11. Extent of Cognitive Information about Politics: in addition to considering the effects of partisanship, the overall richness of cognitive information about politics (often called the difference between "naive" versus "sophisticated" citizens) was studied as a possible factor in viewers' responses to seeing leaders on television.

²¹In the 1988 study, viewers also completed the Cloninger TPQ personality inventory (Cloninger, 1987; Carlotti, 1988). Results from this data are not yet fully analyzed.

a. Measurement of variable: the extent of information as measured by verbal responses to attitude and information questions on pretest questionnaire was scaled and correlated with between-subject differences in emotional responses and attitude changes after watching same displays.

b. Principal effects found: less informed or naive viewers are more influenced by displays and cues than those with rich information or strong attitudes.

In addition to findings reported above with regard to attitudes toward leaders, partisanship, and ideology, the best evidence of this effect concerned a study in which viewers watched the 1976 Presidential debate between Ford and Carter either with or without network journalistic commentary, recorded responses to both leaders, and then saw a routine newscast story about the debate. While journalist's cues both in the commentary after the debate and the newscast had an effect on all subjects, naive or relatively uninformed viewers were more effected by negative descriptions and judgments of both candidates (Newton, et al., 1987).

c. Explanatory hypothesis. Political information processing should be more complex when viewers have greater information and cognitive complexity, especially insofar as the modular or parallel processing structure of the central nervous system (Gazzaniga, 1985) implies that such cognitive richness entails reliance on cortical and linguistic memories which qualify the immediate effects of nonverbal cues (cf. Appendix I).

12. Culture of Viewer: to measure cultural differences, similar experiments contrasting the effects of H/R, A/T, and F/E were conducted in both France and the U.S.

a. Measurement of variables: responses of similar samples in France and the U.S. were compared, using similar experimental

designs and questionnaires, with excerpts showing national leaders of each country. To control for linguistic differences in words used for display behavior and emotional response, all affective terms in the American questionnaire were translated into French and then back-translated to English by a bilingual French scholar; terms with discrepant meanings were dropped from the final instrument (Masters and Sullivan, 1989a, 1989b).

b. Principal effects found: the description of facial displays and the structure of emotional responses is highly similar in each country, but French viewers are more likely to respond with positive emotion to A/T display and prior attitude is more likely to interact with descriptions and emotional responses in France than in U.S.

Although these findings have already been indicated in passing, it is useful to summarize cross-cultural similarities and differences. The structure of words used to describe displays is essentially the same in France and the U.S. (Masters and Sullivan, 1989a, 1989b; Masters and Mouchon, 1986), as is the pattern of using verbal self-reports of emotional responses to the excerpts (see above, Figure 2). American culture does, however, seem to have "ritualized" A/T in a rather different way than the French: whereas viewers in the U.S. respond more positively to H/R displays than to those of A/T, these two types of display behavior are less different in their effects on French viewers (Masters and Sullivan, 1989a: Figure 4; Masters and Sullivan, 1989b: Figures 2a-c and 3a-c).

c. Explanatory hypothesis: since cultures often differ in the way similar nonverbal cues function as social signals, it is to be expected that the evolved propensity to respond to facial display cues should be shaped by culture and political traditions; French viewers seemingly expect leaders to be rather more authoritative than do Americans, for whom an egalitarian tradition suggests the propriety of more reassuring displays by leaders.

13. Socio-economic status of viewer: differences in social class or ethnicity within the United States should also be expected to influence responses to the same stimuli of leaders.

a. Measurement of variables: using the same experimental paradigm, an identical set of excerpts was presented to widely different groups of students (Grambling State University, an open-admission black college, students at Boston University, and undergraduates at Dartmouth) in the week before the 1988 American Presidential election; since Dartmouth's students reflect higher socio-economic status than the other two samples, between-sample averages permit an assessment of the effect of social background and ethnicity in responses to leaders.

b. Principal effects found: although displays of national leaders are described in similar ways by all subjects, emotional responses to most leaders are weaker in both lower class samples than for Ivy League subjects.

Since analysis of this data has just begun, the findings reported here (see Table 3) should be considered as tentative. It is nevertheless evident that many leaders elicit very different responses depending upon the socio-economic groups seeing them: e.g., both lower-class samples perceived and felt more positive emotion than did Dartmouth students when viewing Jackson. Black subjects responded with extraordinarily strong positive emotion to Dukakis (at a time when other subjects were not aroused by his excerpts) as well as to Jackson; not only did other American politicians elicit much less positive emotion from black viewers than for whites, but the results show a few strong cases of counter-empathy (such as increased negative emotions after seeing Reagan's H/R displays as contrasted with his neutral ones).

Table 3

Viewers' Net Positive Emotional Response To The 1988 Presidential Candidates After Seeing Their Happy/Reassuring and Their Neutral Displays²²

LEADER	University					
	Ivy League ER to H/R	Ivy League ER to Neut	Black ER to H/R	Black ER to Neut	Urban ER to H/R	Urban ER to Neut
Reagan	5.24*	1.74*	-.55	-.38	2.15*	.78*
Hart	2.30*	-1.13*	.94	-.28	2.18*	-1.13*
Bush	.69	.56	-.28	-1.24	-1.78~	-.34~
Dukakis	1.79~	.91~	5.58*	3.47*	2.93	3.35
Dole	.32	-.82	-.60	-1.55	.10	.55
Jackson	1.41*	-.22*	6.48*	6.83*	3.22*	1.61*
Gephardt	.29*	1.89*	1.18	.71	1.25	.70
Robertson	.22~	-.78~	.77*	-.51*	-1.61	-1.66

* Net Positive Emotional Response = [(Happy+Comforted) - (Angry+Fearful)] Each emotional response measured on a 0-6 scale. By an F test * = statistically significant at $p < .05$ and ~ at $p < .10$. N = 55 the Ivy League U, N = 47 for the Black University, and N=41 for the urban university.

c. Explanatory hypothesis. It is of particular interest that there is a relative absence of display effects on attitude among the lower class samples: for blacks, for example, it would appear that the cognitive information distinguishing between Jackson and Dukakis on the one hand, and all other leaders on the other, was sufficiently salient that display behavior did not provide additional information that was perceived as relevant to emotional response or attitude change.

D. Factors Associated with the Social Context

14. Status of leader: since followers tend to focus attention on dominant individuals and respond differentially to them (Chance, 1976), public opinion ratings of leader at time of experiment were considered as a measure of status that might affect viewer responses.

²² The three universities are Dartmouth, Grambling, and Boston University.

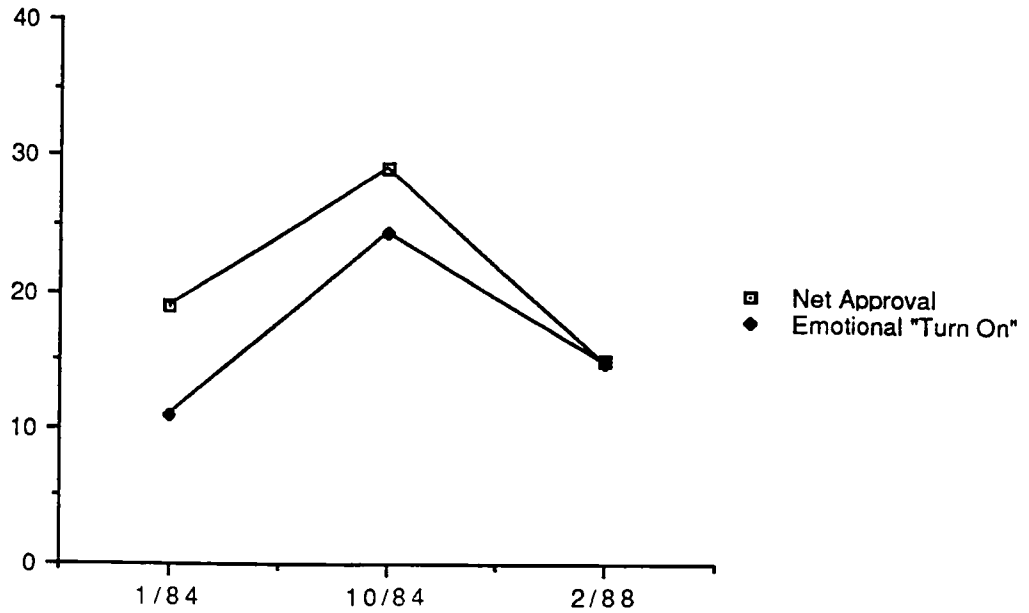
a. Measurement of variable: the same excerpts of Reagan were shown to comparable samples at times when his ratings in national public opinion polls had changed; each sample's average "net warmth" of emotional response (self-reported feelings of happiness and comfort minus feelings of anger and fear) to the H/R excerpt was subtracted from net warmth to the neutral excerpt to measure the display effects while controlling for other variables (see above, Variable #6 - Display Intensity). These difference scores were then compared with changes in the "net positive" public opinion poll rating (percent of the public favoring the leader minus percent opposed).

b. Principal effects found: the more favorable the public opinion toward a powerful leader at the time of experiment, the greater the evocative effect of same display. ²³

For comparable samples drawn from the Dartmouth College student population, the enhanced net warmth of response attributable to President Reagan's H/R excerpt increased from January 1984 to November 1984, paralleling an increase in Reagan's net approval rating in the public opinion polls; a decline in support in public opinion between November 1984 and February 1988 was again paralleled by a decline in the effectiveness with which Reagan's H/R display elicited positive emotion (see Figure 4). These changes attributable to Reagan's status were somewhat stronger for females than for males

²³ In the 1988 study using displays of all Presidential candidates, the intensity of the positive emotional response to Bush's H/R display did not rise significantly between February and November, nor did Dukakis' H/R display have significantly different effects over the course of the campaign. Because the experiment was designed to measure the change in emotional response over the campaign to the same display of each candidate, we chose the best available exemplar of a Bush and Dukakis H/R display from a very restricted set, and at the outset of the year, Bush's display behavior was often perceived as blending fear with happiness (Suplee, 1988; Barnes, 1988). There is some evidence that changes in Bush's H/R display behavior over the course of the campaign (and particularly after the Republican Convention) made him more evocative, whereas our study had to use an exemplar dating from the period before the first primaries.

Figure 2: Net Approval of Reagan and Emotional Responses to Identical Excerpts, 1984 and 1988*



*Enhanced emotional response attributable to H/R display (Emotional "Turn On") = Difference between self-reported net warmth of emotions (happiness and comfort minus anger and fear) during the same neutral and H/R excerpts of President Reagan; see Variable #6, "Intensity of Display." The three experimental samples are comparable (Sullivan and Masters, 1988a; Carlotti, 1988). Net approval = % approving Reagan minus % disapproving, *New York Times* public opinion polls closest to date of experiment. For ease of comparison, the emotional "turn on" score was multiplied by a factor of 10.

c. Explanatory hypothesis: since leaders tend to serve as the focus of attention among nonhuman primates, children, and adults (Chance, 1976; Montagner, 1977; Goodall, 1986), the evocative properties of the same display behavior are correlated with the dominance status of the individual exhibiting them (Sullivan and Masters, 1989a: 6).

15. Competitive versus Noncompetitive Viewing Context:

since leaders are more likely to elicit responses based on partisanship and prior political attitudes when they are challenged by meaningful rivals, there should be a difference in the effects of displays depending on whether leaders are seen alone or in a competitive context.

a. Measurement of variable: average responses to same excerpts when leaders were seen along with rivals for power were compared with responses to the same excerpt when the leader was seen alone in viewing session.

b. Principal effects found: in competitive contexts, prior attitude more likely to be activated in response to display and viewing experience and H/R displays more likely to polarize supporters and critics.

In a study showing excerpts of President Reagan without any other leader, H/R, A/T and F/E displays elicited EMG and autonomic responses that did not interact with viewer's attitudes (McHugo, et al., 1985); when Reagan and Hart were shown together in a subsequent study, the same psychophysiological measures interacted with prior attitudes (McHugo, Bush, and Lanzetta, 1987).

16. Framing or Cueing: interpretation of events by an authority figure or journalist should also influence viewers emotional responses and attitudes toward leaders (Iyengar and Kinder, 1987).

a. Measurement of variables: between-subject differences in responses were analyzed after the 1976 Presidential debate between Ford and Carter was seen with and without journalist's "instant analysis," and were further compared to within-subject differences in responses immediately after debate and later after watching news coverage of the same event (Newton, et al, 1987).

b. Principal Effects found: not only were descriptions and emotional responses influenced by the news commentators' judgments, but instant analysis and subsequent news coverage had additive effects

Average descriptive ratings of the strength and happiness of both rivals in the Presidential debate were lower -- and descriptions of anger and fear higher -- for viewers who saw an instant analysis critical of both candidates; similar differences occurred for emotional response and attitude (Figure 5). Later, after both groups of subjects saw a newscast story on the debate, ratings and attitudes declined further. The authoritative cues of journalists had, moreover, greater impact on "naive" viewers than on those with more sophisticated cognitive information (see above, Variable # 11).

FIGURE 5 (= NEWTON ET AL FIGURE ?) ABOUT HERE

c. Explanatory hypothesis: since viewers rely on cognitive cues that frame information presented to them, journalistic reports serve to "frame" or "cue" perceptions of nonverbal behavior and felt emotional responses as well as cognitive judgments.

Conclusions

The effects of facial displays, not to mention other nonverbal cues, seem to be of bewildering complexity. The simplistic dichotomies which long dominated discussions of human psychology

-- nature versus nurture, emotion versus cognition, or instinct versus learning -- seem inadequate to account for the way citizens respond when viewing powerful leaders on television. Instead, experimental evidence suggests how a wide range of factors are integrated when viewers process meaningful information about rival candidates or political leaders.

Although it seems paradoxical at first that facial displays should play such an important role in political information processing, recent research in neuroscience contradicts traditional approaches which isolate cognition and emotion. The "modular" or "parallel processing" models of the central nervous system (Gazzaniga, 1985; Mishkin and Appenzeller, 1987; Appendix I), which now seem beyond question, have three essential implications for political psychology: first, it is only to be expected that a wide variety of verbal and nonverbal cues will interact when citizens engage in political behavior; second, patterns of response should differ not only from one individual to another, but from one setting to another; and third, nonverbal cues like the facial displays studied here will sometimes -- but not always -- have significant effects in leader-follower relations.

That the face plays an unexpectedly important role in social behavior and cognitive information processing has become evident in a number of studies far removed from political psychology. Not only are the infant's responses to a mother's facial behavior a stable behavioral trait apparently associated with individual personality (Izard, Embree, and Heubner, 1987; Kagan, Reznick, and Snidman, 1987; Kagan, 1988), but latency and habituation in response to new faces at 8 months predict verbal behavior at one year and four years of age (Bornstein, 1988). Reasons for these findings can, moreover, be found in the discovery of the neuroanatomical structures implicated in associative learning and memory, since the inferior temporal lobe and closely related sites specialized in processing facial cues are directly linked to

components of the limbic system playing a central role in both social and cognitive behavior (Appendix I).

These results have practical implications, providing a more realistic approach to puzzles that have long confronted political psychology. From time to time, episodic events seem to change the political landscape. Often, however, the mechanisms that might account for these changes are puzzling. In the first polls after the Democratic nominating convention in July 1988, Dukakis led Bush; after the Republican convention, George Bush received what journalists call a favorable "bounce" and took the lead in opinion polls. These changes were, however, sharply different for men and women. In July 1988, only 26% of females approved Bush whereas 43% of males did so, while Dukakis was favored by 56% of females compared to 46% of males (*Wall Street Journal*, July 28, 1988, p. 52). In mid-August, after Bush's nomination, Dukakis trailed his rival 39% to 49% among males but only 42% to 44% among females. How might such short term changes be explained?

Because Presidential nominating conventions provide a national focus of attention, citizens are more likely to see rival leaders at these moments than in the routine periods of a campaign. It is surely plausible that emotional and cognitive responses during such focal events contribute to changes in public opinion (cf. Orren and Polsby, 1987). But episodic responses to rival leaders need to be studied in terms of the concrete cues presented to the viewer and the actual patterns of information processing capable of generating attitude change. On methodological grounds, experimental studies of responses to naturally occurring events in which citizens observe leaders seem necessary to account for opinion changes that are tracked by the polls; pragmatically, such experiments have the advantage of permitting an assessment of the way nonverbal cues and verbal information might be integrated during the events that actually shape political life.

This analytic approach permits a more realistic assessment of the way episodic memories are formed under the influence of perceptions and emotional responses at the moment of watching a leader, which thus might explain the enormous effects of campaign debates or focal events like Muskie's "sobbing" in 1972 and Bush's acceptance speech in 1988. As we have shown, however, the interrelationship between the leader's nonverbal behavior, the viewer's emotions, and lasting attitudes is extraordinarily complex: at least sixteen different variables seem to be implicated in the system by which the citizen responds to the experience of watching a political leader.

This is not to say that the results are definitive or always easily explained. Consider again the differences in males' and females' episodic responses to Bush and Dukakis during the summer of 1988. Although gender differences in social and political behavior have frequently been demonstrated, theoretical explanations of these differences and plausible mechanisms to account for them have been highly controversial. By focusing on emotional and cognitive responses while watching powerful leaders, it is at least possible to suggest that one way that the gender might influence political life concerns modes of information processing (Masters, 1989b; Masters and Carlotti, 1988; Appendix I).

Ultimately, political psychology will need to build links between such every-day phenomena as the citizen's feelings and judgments about rival leaders and the discoveries of neuroscience. As a first step in this direction, more research is needed to explore episodic emotional and cognitive responses as they relate to long-term attitudes. While facial displays may be interesting in themselves as evidence of the way presentational styles and expressive behavior relate to rhetoric and political effectiveness, at a deeper level the study of nonverbal cues in politics provides a valuable approach to the underlying process by which emotion and cognition are integrated in all political behavior.

APPENDIX I

POLITICAL INFORMATION PROCESSING AND COGNITIVE NEUROSCIENCE

In the literature of political psychology, increased attention has been given to models of "political information processing" which stress the cost of information and cognitive analysis. For the citizen, time and effort are needed to learn about political issues and candidates. As a result, it is argued, voters use simple "schemas" or "chronicities" to simplify the way they process political information (Lau, et al., 1988; Lodge, et al., 1989). In one formulation, the voter should be described as a "cognitive miser," seeking to minimize these information costs in response to political life.

Interestingly enough, however, information processing models have often ignored emotion, even though the attribution of a lasting emotional "bias" or "valence" to information is an effective device for simplifying the cognitive process. This is particularly important in the light of research in cognitive neuroscience -- a discipline that has rapidly developed in the last decade. Using techniques ranging from PET or NMR scanning of the entire human brain to the measurement of single cell responses during specific information processing tasks, cognitive neuroscientists are rapidly transforming the understanding of how the central nervous system works.

These recent studies of the structure of the brain demonstrate the essential role of episodic and lasting emotion in cognition and confirm the importance of the face as a social stimulus among primates generally. It has now been demonstrated, for example, that when the face of a conspecific is perceived and identified, a characteristic ensemble of neurons in the visual areas of the inferior temporal lobes ("inferotemporal cortex") is activated (Rolls, 1987, 1989a). This neuronal area is, in turn, closely linked with emotional responses mediated by the limbic system (especially the amygdala and hippocampus) -- centers that are essential not only for emotion, but for associative learning and memory (Mishkin and Appenzeller, 1987; Squire, 1987: esp. 336).

The temporal lobes are particularly important in social behavior: among free-ranging nonhuman primates, damage to this structure seems to prevent bonding with others and results in the ostracism of the affected individual (Kling, 1986); humans whose temporal lobes are damaged or destroyed not only exhibit the same behavioral traits but report an inability to establish emotional bonds or feelings when interacting with others (Kling, 1987). It is therefore of particular relevance that approximately 10% of the neurons in the visual pathway of the inferotemporal cortex of nonhuman primates are specialized in processing information of facial stimuli (Rolls, 1989a). The neuronal network for the perception of faces is thus an important component in the neuroanatomical structures underlying learning, memory, and social interaction in humans as well as in nonhuman primates.

Although it should hardly be surprising that the sight of a face is an important cue in the social interactions of humans (Darwin, 1872; Tranel and Damasio, 1985), research on the interactions between mothers and infants confirms that responses to facial cues are important predictors of the growing child's social behavior or personality (Izard, Hembree, and Huebner, 1987; Izard, 1988). Perhaps more surprising has been the discovery that the latency and habituation in processing the perception of faces by four month old infant's is a significant predictor (along with mother-infant social interaction) of the child's verbal abilities at the age of 1 year and 4 years of age (Bornstein, 1988). In short, perception of

the face seems to be implicated not only in social behavior and personality, but in some ways this system seems to be linked to the capacity for associative learning more generally.

While ensembles of cells in the inferio-temporal cortex are implicated in distinguishing between one known face and another, moreover, some seem to be specialized in decoding specific cues underlying the facial displays used in our studies. To cite but one striking example, single neurons have been identified which only fire on the perception of the vertical (or "dorsal") head movement (Rolls, 1989b) -- a movement associated with threat which illustrates Darwin's principle of antithesis and plays a major role in the anger/threat displays identified in our prior work (Masters, et al., 1986: Figure 1). In short, the hardware of the human brain seems to be organized in a way that would make the experience of seeing the facial displays of leaders particularly salient.

While the inferotemporal cortex is important in the processing of perceptions which become the basis of "episodic memory," moreover, the limbic system is in turn closely linked with areas in the associative cortex where prior cognitive memories are stored (Rolls, 1989a; Squire, 1987; Mishkin and Appenzeller, 1987). The central nervous system is thus so structured that when one human sees another, the establishment of new attitudes or the comparison of current behavior with prior attitudes can easily be related to the sight of the face and any cues associated with it. As a result, the latest neuroanatomical studies are consistent with our prior evidence that the experience of seeing leaders on television influences viewers' emotional and cognitive responses in a way that can have lasting effects on attitudes and behavior.

Ultimately, research in cognitive neuroscience may suggest mechanisms that could explain many questions in political information processing, such the often puzzling similarities and differences in cognition between men and women. Although reasons for observed gender differences remain highly controversial (Masters, 1989b; Masters and Carlotti, 1988), evidence like that presented here indicates the importance of going beyond traditional sociological models. One hypothesis concerns patterns of cerebral lateralization that are entailed in cognition or emotion, and which may vary by gender (Masland, 1981; Gazzaniga, 1985; Geschwind & Galaburda, 1987). For example, split brain studies show that both facial recognition and decoding of facial displays tend to be localized in the right hemisphere among monkeys and humans, whereas discrimination tasks are left hemispheric in monkeys -- just as speech and abstract analysis are typically left hemisphere functions in humans (Hamilton & Vermeire, 1989). Because differences in the extent of lateralized information processing have repeatedly been found between men and women, especially with regard to social cues (Masland, 1981; Mendoza and Barchas, 1984), males and females may differ in the pattern of cognitive processing even where they tend to agree -- as they often do -- on the substantive matters (Masters and Carlotti, 1988; Masters, 1989b). Other neurological mechanisms, associated with the effects of sex hormones on the neonatal development of the hypothalamus, might also explain observed gender differences in the way information is processed (Williams, 1989). While such hypotheses lie outside the realm of political science, they suggest the importance of neurological processes if one is to understand the way facial displays and political attitudes relate to the experience of watching leaders on television.

Democratic political theory must, in the long run, consider the findings of such research. While it has long been assumed that the human brain is a "black box" which cannot be observed directly, this is no longer true. One of the main consequences is the demonstration that the central nervous system, while subject to modification and restructuring during experience, is not the "tabula rasa" described by Locke and assumed by many behaviorists. Political learning is, like all learning, necessarily mediated by

structures that include the centers of the brain directly associated with emotion. In the Western tradition, the greatest political thinkers understood human behavior in terms of a complex integration of passion and reason. Recent scientific research shows that it is both necessary and possible to return to that perspective (Masters, 1989a).

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