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PEERS' MUTUAL EYE CONTACT: CIRCUMSTANTIAL AND INTERPERSONAL CORRELATES

By

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ABSTRACT

PEERS' MUTUAL EYE CONTACT: CIRCUMSTANTIAL AND INTERPERSONAL CORRELATES

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Peers' subjective estimates of mutual eye contact in seconds (SEMECS) with each other member of five-to-nine person interpersonally-oriented groups for mixed-sex adults that met twice weekly for about 20 sessions (mostly of 90 minutes) were collected for their 4th, 8th, 12th, and 17th meetings. All eleven available groups were randomly assigned to one of three SEMECS treatments: Training and Feedback (T + F), Training only (T), and neither Training nor Feedback (N). Three T + F groups and four T groups made SEMECS estimates on each occassion, while four N groups made these estimates only at their 12th and 17th sessions. Several weeks distant from most SEMECS estimates, the total set of 73 participants were also administered selected interpersonal measures.

Despite nearly equal initial mean SEMECS estimates, averaging about 16 seconds with each partner within both T + F and T groups, the subsequent estimates by T groups consistently averaged near 12 seconds, over double the T + F groups' 5- to 6-second estimates. Much higher were the N groups' separate estimates of roughly 30 seconds each. Thus, feedback and training lowered SEMECS sharply and distinctively.

Declining estimates were also broadly associated with growing familiarity with group peers and the SEMECS task. T + F groups showed the greatest interpartner SEMECS agreement and their three postfeedback mean estimates were very stable and also displayed high intergroup consistency.

Outgoing and expressive interpersonal attributes correlated positively and reliably with partner-based SEMECS, while self-based SEMECS's comparable correlations were near the chance level. These SEMECS-personality linkages also appeared influenced by treatments (clearer for the more considered and restrained estimates of T + F groups, weaker for T groups, and puzzling for N groups) and measures (clearer if SEMECS was aggregated over occasions than if assessed on single occasions). Because most SEMECS-personality correlations concerned measures administered weeks apart, the robustness of the consistently significant linkages seems noteworthy. This subjective approach to assessing nonverbal behavior showed promise for other naturalistic applications and suggestions for enhancing the brief training and feedback procedures employed here were offered.

DEDICATION

Ngabuye ngadla! mina kababa:

uMathumbetwala awabonwa
Abonwa zinqapheli
UPotolozi kwabamhlophe abelungu.

Lenyoni ngiyethula nakuwe mama, Heli, ntombi yase-Mbo e-Magogo, kanye nasemndenini wami ongibekezelele kunzima ngizabalaza ngisombulula inzulu nokujiya kolwazi.

Bafowethu kanye nodadewethu bonani ukuthi ningenzani ngengihlabene ngakho.

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"We are perpetually confronted with hard times,
the forerunners of great opportunities."

BUSHGRADUATE

J.M.B. Hadebe, 1980
at an
International Conference in Montreal, Canada

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INTRODUCTION

Mutual glance is a nonverbal communication cue salient during human interaction (Mehrabian, 1971a, 1972, 1976, 1978, 1980; Merhrabian & Epstein, 1972; Siegm & Feldstein, 1978). Eye contact (EC) may be used (a) to influence the quantity and quality of interpersonal relationships (Samovar, Porter, & Jain, 1981; White, 1975); (b) to indicate that communication channels are open (Heun & Heun, 1975; Williams, 1977); (c) to convey a need for affiliation (Mehrabian, 1981; Mehrabian & Ksionsky, 1974; Russell & Mehrabian, 1978); (d) to help interactants feel closer as the physical space between them increases (Patterson & Sechrest, 1970; Russo, 1975); (e) to produce anxiety in others (Russell & Mehrabian, 1978; Samovar, Porter, & Jain, 1981); and (f) to express personal liking and appreciation (Goldstein, Kilroy, & Van de Voort, 1976; Kleinke, Meeker, & LaFong, 1974; Mehrabian, 1981; Pellegrini, Hicks, & Gordon, 1970).

The avoidance of EC during interpersonal communication has several silent messages. It may be utilized to hide inner feelings (Nielson, 1962; Samovar, et al, 1981); to express dislike or tension or recent deception (Ellsworth, Carlsmith, & Henson, 1972; Fugita, 1974); to increase psychological distance when people are too physically close (Heun & Heun, 1975; Storm & Thomas, 1977); and to discourage any social contact (White, 1975). Lack of EC also suggests uncertainty (Day, 1964; Knapp, 1972), a sense of inferiority (Edelman, Omark, & Freedman, 1974), a sense of unconcern, a feeling that one is being manipulated,

hostility, and shyness (Mehrabian, 1981).

Eye contact's importance has stimulated a great deal of research. However, virtually all these studies were conducted in laboratories under experimental conditions (Scherwitz & Helmreich, 1973; Kimble & Oszewiski, 1980). A number of authors have commented on the artificiality of the commonly used model that features a continuously-staring confederate or interviewer. Thus, Kendon and Cook (1969) remarked that "most studies have employed a continuously gazing confederate, so that whenever the subject looks at the confederate, eye contact occurs; this is a rather artificial situation" (p. 481). Libby (1970 supported their objections.

A prior work (Hadebe, 1983) attempted to move beyond these criticisms by investigating mutual eye contact (MEC) within the naturalistic setting of small groups attending to the members' interpersonal processes that interacted much more naturally. MEC is defined as an event in which two people claim to have looked at each other's eyes while communicating verbally or nonverbally. This definition of mutual glance agrees with Esser (1972) and Von Cranach and Ellgring (1973) who viewed EC as an event in which "both partners look into the other's eyes" (p. 220). Hadebe's (1983) MEC events occurred during meetings of small interpersonally-oriented groups for university undergraduates and substantial positive linkages were found between dyads' subjective MEC estimates and personal liking in accord with similar findings from laboratory investigations (Exline, 1963; Kleinke & Pohlen, 1971). Uncontrolled confounding variables that included feedback about partner's prior MEC estimations, differing degrees of familiarity with partners and also with the MEC measure, as well as varying MEC estimation training procedures partially clouded the

meaning of Hadebe's (1983) findings. The present work extends this prior study in also being conducted within a non-artificial environment (i.e., no manipulated variables) of small naturalistic groups. Its scope has been expanded to better identify relationships between subjective estimates of MEC, on the one hand, and familiarity, training, and feedback about MEC estimation, on the other. It also attempts to link MEC to a wider band of interpersonal behaviors, including measures representing both the subjective and objective domains.

REVIEW OF RELEVANT LITERATURE

The apparent importance of eye contact, mutual glance, or gaze has stimulated extensive research in many fields.

Cross-cultural Communications

Avoidance of eye contact (EC) is an expression of respect in some societies. Thus, among the Nguni and Sotho traditional natives (Blacks) in South Africa the author knows, from personal experience, that it is a sign of disrespect, and perhaps even of defiance, for a child to maintain EC while talking with an adult, or for a wife while talking with her husband. When they are together in private, however, away from other people, a wife may maintain EC while talking with her husband. Similarly, in the Mexican culture, children are expected to avoid EC with adults as a sign of deference. For example, children, especially females, are taught to lower their eyes while talking with an adult. In these cases lowering of eyes during dyadic interaction is not indicative of any hidden information, as seems widely believed by South African Whites and perhaps also in Western cultures. This observation is consistent with Argyle and Dean's (1965) report that "there are cross-cultural differences, varying from taboos on eye contact, to much greater amounts of intimacy than [is] common in Western countries" (p. 290).

In dyadic communication South African Blacks and Whites tend to attribute different meanings to EC. For instance, Blacks avoid EC with their superiors as a nonverbal sign of recognition and respect for the

authority-subordinate relationship. This observation is in accord with Rosenfield and Civikly's (1976) comment that the Black Americans, Chicanos, Native Americans, and Puerto Ricans avoid EC to express recognition and respect for the authority. Whites, on the other hand, regard avoidance of eye-to-eye contact as a manifestation of apprehension, perhaps even of lying. These different attributions to the same stimuli (EC) often contribute to misunderstandings, tensions, and even conflicts during Black-White dyadic communication, especially where the latter is unable and/or even unwilling to consider the other's philosophy of life. Edward T. Hall, cited by Samovar, et al. (1981), observed that silent messages (EC inclusive) can cause far-reaching miscommunication between interactants of different cultural backgrounds. Addressing himself to participants who, in a dyadic communication, were in power, and whom he saw as both capable of, and responsible for, mitigating this problem, Hall wrote:

> I am convinced that much of our difficulties with other people in other countries stem from the fact that so little is known about cross-cultural communication. . . . Formal training in the language, history, government and customs of another nation is only the first step in a comprehensive program. Of equal importance is an introduction of the nonverbal language which exists in every country of the world and among the various groups within each country (p. 154).

The importance of EC can also be seen in certain areas of Mexico where the population is generally divided into two extremes: the compesinos (peasants or farm workers) and the ricos (upper class or rich people). Customarily, the farm workers are expected to avoid EC with the rich people if they seek their favor or approval. The latter, too, expect the former to look down and avoid EC as a sign of humbleness. However, the compesinos dislike this traditional manner of relating to the rich people since it is a sign of subservience and even

servitude. It is interesting to note that when Mexicans cross the U.S. border, the meaning that they attribute to EC often causes problems because their North American superiors perceive avoidance of EC as indicative of hiding information. Their Mexican-American friends, too, often encourage them to look at their employers in the eye. Cross-culturally, the import of EC can either facilitate or complicate interpersonal communication.

The meaning of EC avoidance tends to change from one culture to the other. For example, in some Far Eastern cultures, it is impolite to gaze directly in the eyes of the other person during communication. On the other hand, the Arabs believe that interactants ought to make "use of personal space, stand very close to their communication partners and stare into their eyes" (Samovar, et al., 1981, p. 172). Arabs believe that an eye is a key to a person's being and one's soul. Perhaps, this is one of the reasons that the Palistine Liberation Organization Chairman, Yasser Arafat, frequently wears glasses, even indoors. He might be avoiding EC with his interactants so that they may not see deep into his soul and being or into his eyes, "the mirror of the mind" (Nielson, 1962).

In some cultures, male-female relationships influence EC. Like among South African Nguni and Sotho natives (Blacks), women are expected to avoid EC with men in many Asian cultures. Consequently, out of courtesy most men avoid looking straight into the eyes of women. It is interesting to note that this practice is in direct contrast to what is done in France, where it is a norm for men to stare at the eyes of women in public. In North America, a prolonged stare in the context of other cues is commonly used by homosexuals (Samovar, et al., 1981) as a way of saying "I am interested in you.

Let's start a relationship."

EC and Survival

People also use EC for survival purposes. Thus, if a pedestrian comes to an intersection and finds a vehicle halted in response to a STOP sign, s/he is likely to look directly into the eyes of the driver before starting to cross in front of the automobile. A pedestrian does this to ensure that the driver is aware of him/her and that s/he will allow him/her to cross safely. In some circumstances, however, one may be more likely to ensure safety by avoiding EC. Illustrating this strategy of survival, Russell Baker of the New York Times wrote:

> Veterans of New York's guerilla life know better than to make eye contact with other people on the streets. For the criminal, eye contact is an invitation to produce his knife. . . . The rule of survival is never look anyone in the eye, and it is a hard, hard rule to follow at times. . . . Among outlanders there is an embittered old saying about New York that there are a million people on every street corner and not one of them will give you so much as a glance. Those million people are not being coldblooded. Just surviving (1981, p. 17A).

This observation is implied in Mtshali's (1982) poem entitled "Nightfall in Soweto." It may also be very true of the other South African black townships.

EC and Assurance

EC may be used in attempt to get the truth which is not expressed in a verbal message. This is sometimes done since it seems widely believed that the eye is the "mirror of the soul" (LaFrance & Mayo, 1976). This was examplified by the Senate testimony of Herbert W. Kalmbach, one of President Nixon's personal lawyers. Kalmbach had received instructions that he ought to make private payments to the

Watergate accomplices. However, before doing so, he attempted to get assurance from Nixon's aide John Ehrlichman, that the appropriation of these funds was right and legal:

> Kalmbach: I can remember it very vividly because I looked at him, and I said, "John, I am looking right into your eyes. I know Jeanne and your family, you know Barbara and my family. You know that my family and my reputation mean everything to me, and it is just absolutely necessary, John, that you tell me, first that John Dean has the authority to direct me in this assignment, that it is a proper assignment, and that I am to go forward on it.
>
> Dash(*): And did he look at you in the eyes?
>
> Kalmbach: Yes, he did.
>
> Dash: What did he say to you?
>
> Kalmbach: He said, "Herb, John Dean does have the authority, it is proper, and you are to go forward."
> (Hearing Before the Select Committee on Presidential Campaign Activities, 1973, p. 2106).

It is clear that Kalmbach intuitively sensed that he was being involved in an improper arrangement. In his attempt to ensure his safety he requested Ehrlichman to be honest, looked him in the eyes, and even reminded him of their family ties (Grumet, 1983). Unfortunately, for Kalmbach, this was a vain effort, because, despite this testimony, he did not succeed in exonerating himself. Ehrlichman later denied that this talk ever occurred (Miller, 1974). Thus, it is essential to note that maintaining EC with a listener is not necessarily a sign of complete disclosure since pathological liars, e.g., psychopaths, tend to maintain large amounts of EC while telling lie after lie (Hadebe, 1983).

(*) Samuel Dash, was the Chief Counsel for the Senate Watergate Committee.

Eye contact (EC) may also be a cunning survival strategy in a world of business. Thus, Brooks (1962) has documented how upper-tier executives of the General Electric (G.E.) Corporation for years employed various nonverbal behaviors, including "an unmistakable wink" (p. 54), to advance and communicate various illegal policies with each other and selected customers. Their "wink" style of communications, amply documented by Federal court records, was adopted to evade federal anti-trust laws (Section I of The Sherman Act of 1890) and was standard company policy for at least seven years. It avoided leaving a "paper trail" of illegal acts and could not be captured by sound recordings. Eventually several G.E. executives confirmed these illegal techniques in exchange for lighter prison sentences. These diverse functions of MEC, or its absence, reinforce the necessity of viewing the present findings within the pertinent social context and caution that they may not be broadly generalized to divergent circumstances.

Empirical Studies of EC

It is likely that no other nonverbal behavior has evoked as much attention from researchers as has EC. According to Samovar, et al. (1981) "in group communication we spend between 30 and 60 percent of our time in eye contact with others. It is estimated that 10 to 30 percent of our looks have a duration of about one second" (p. 171). Knapp (1972) observed that speakers may maintain EC with "their interactants to indicate the conclusion of thought units and to check their interactant's attentiveness and reaction. . . . [or to] seek feedback concerning the reactions of others" (p. 131). This observation agrees with Samovar, et al. (1981) who wrote "we may look to discover how they react to something we have said" (p. 171). Thus, EC is an

"indication of seeking reaction of others" (Heun & Heun, 1975, p. 39) and can function "as a means to monitor and observe the partner or information seeking" (von Cranch & Ellgring, 1973, p. 420). A communicator may employ EC to seek feedback as markers in the conversation (Duncan & Niederehe, 1974; Knapp, 1972) or in gauging the addressee's reaction to the communicator's speech or, as Exline, Ellyson, and Long (1975) put it, "to obtain information from and about the speaker which cannot be derived from his words alone" (p. 24). These remarks agree with Ellsworth and Ludwig (1972) who concluded "that a direct gaze has an arousing effect on the target" (p. 390). However, these authors further commented, "presumably such a gaze must deviate from the normal background of regulatory behavior, or must occur outside the context of a verbal behavior, in order to be arousing" (p. 390). In a nutshell, a speaker can utilize EC as another aspect of approach (Mehrabian, 1981).

According to Argyle and Cook (1976) and Exline and Fehr (1978), gaze and mutual gaze are forms of nonverbal behavior that have great meaning in human communication. This observation was supported by Libby and Yaklevich (1973) who remarked that nurturant individuals tend to express their interest and love of others by maintaining EC with them irrespective of whether or not the same amount of love and interest is being shown in return. Ellsworth and Ludwig (1972) concluded that EC in a dyadic interaction both indicates and calls for a certain amount of involvement.

Eye contact also seems widely used to convey needs for intimacy and inclusion (Argyle & Dean, 1965; Ellsworth, 1975; Exline, 1963; Ellison, Dovido, Corson, & Vinicur, 1980; Heun & Heun, 1975; Kendon, 1967; Mehrabian, 1981). To this role of EC in nonverbal communication,

Knapp (1972) added

> Those who have affiliative needs tend to return glances more often. Such affiliative needs may be the basis for a courtship relationship. Hence, the descriptive term "making eyes." Both males and females are prone to choose partners with eye contact when introduced (pp. 132-133).

This remark on the relationship of the expression of need for affiliation through EC and courtship practices agrees with Rubin's (1970) finding that strongly attracted dating couples had more EC with each other than did less attracted ones.

It is not uncommon that eye contact initiates interest which sometimes develops into a love relationship. In "As You Like It," Shakespeare observed "who loveth not on first sight?" This was dramatically portrayed by "a somewhat inexperienced woman" who wrote to the medical column of a Philadelphia newspaper:

> Question: I blame my problem on eyes--mine and those of another. I am a married woman with children and was absolutely not looking for another man. But--BOOM!--there it is. My age is 35. . . . I experienced this feeling whenever our eyes meet. . . . Of this feeling, we have never spoken, but I sense that he is experiencing the same as I am. . . . How does one turn this off? This must be the way many extramarital affairs begin. Where does it come from? What sets it off? Please try to explain it medically. Just what is there in the eye contact to produce such a problem?
>
> Answer: . . . I wish I knew the answer. . . . All I can offer as a doctor is the fact that the eyes themselves are not to blame. If you really want the problem resolved, better discuss it with your family doctor or with a marriage counselor. . . . (Steincrohn, 1975, p. 67).

Psychiatric and Psychological Settings

Studies on eye contact (EC) have also been conducted in psychiatry. Thus, Golberg and Wellens (1983) investigated associations between cardiovascular responses and EC. They found that if their participants

had extended EC with their experimenters, their heart rate and pulse amplitude increased. Decreases in amount of EC were accompanied by declines in these physiological responses. This finding supported Mazur, Rosa, Faupel, Heller, Leen, and Thurman (1980) who demonstrated "that mutual gaze does indeed cause more physiological arousal than control conditions or nonmutual gaze" (p. 50). Apparently, there are positive correlations between mutual gaze and psychophysiological arousal.

Gale, Lucas, Nissim, and Harpham (1972) confirmed their hypothesis that increased EC between an experimenter and a patient would be accompanied by significant elevations in EEG amplitude. This finding was also corroborated by Gale, Apratt, Chapman, and Smallborne (1975) who reported that EEG arousal was highest when mutual gaze occurred in close proximity, but diminished with increased distance. These results confirmed Nicholas and Champness's (1971) observation that direct eye-to-eye contact generates significantly more galvanic skin responses than one-way gazes. These studies and many others (Bloom, Houston, & Burish, 1976; Graham & Clifton, 1966; McBride, King, & James, 1965) reported a positive linkage between mutual glance and arousal.

The importance of EC can also be seen in the psychiatric mental status examination. For example, one symptom of autistic infants is that they do not maintain EC with their mothers (Brooks, Morrow, & Gray, 1968; Foxx, 1977; Hutt & Omstead, 1966; Kozloff, 1973). Paranoiacs tend to maintain large amount of EC with their interactant because of hypervigilance related to their alleged fears that others may hurt them. Extended EC, accompanied by other nonverbal cues, is also used by U.S.A. homosexuals in initiating relationships.

Hinchliffe, Lancashire, and Roberts (1970, 1971), also Rutter and Stephenson (1972), found that depressed, schizophrenic, and psychotic individuals are less inclined to look at partner's eyes. Possibly this is a product of their diminished interest in life and their desire to be left in seclusion.

Mutual glance is also used by psychologists and others as a communication channel to tell whether or not s/he has established "contact" with a patient. Lundberg (1973) reported that patients look more in the eyes of a mental health professional when they trust him/her and realize that s/he is there to help them succeed, and that they maintain less EC if they have less trust and/or confidence in the interviewer. Lundberg also commented that lack of EC might be a reflection of "poor emotional relatedness, lack of affect or inappropriate affect and lack of warmth" (p. 127). This observation supported Hinchliffe, et al.'s (1970) remark that depressed individuals tend to avoid EC with others, and that this lack of EC is an effort not only to discourage too high a degree of intimacy but also to reduce affective contact. These authors also added "it may well be that eye contact is one of the clues which a clinician learns to use, perhaps unconsciously, when making the diagnosis of depression" (p. 570). Any psychiatric and psychological assessment and evaluation seems incomplete without information deduced through EC between an examiner and a patient.

Mutual gaze also seems salient in cross-cultural psychiatric symptomatology. Thus, many Japanese believe in evil-eye superstition in which a patient with a neurotic disorder called <u>taijin kyofu</u>, should avoid EC with other people for fear of injuring them if their eyes happen to meet (Gutheil, 1979). The unnatural power of the eye can

also be seen in the belief of Mexicans and Mexican-Americans in the mal de ojo (evil eye). Here, if one looks at the other person's body (e.g., eyes or hair, especially that of a child or baby) with appreciation or envy or jealousy, and does not touch it, it is believed that body-part of the target person may develop the mal de ojo. This is a folk-illness which manifests itself in some form of infirmity affecting either that organ or the whole body. If this sickness affects the latter, it may be manifested by headache, sleeplessness, drowsiness, restlessness, fever, vomiting, etc. It is important to note that this illness can be fatal. This disorder is commonly treated by prayers, gently rubbing the body with a whole egg, or by having a perpetrator touch the head of the victim, thereby draining off the threatening powers of the evil-eye. Hence, the Mexicans and some Mexican-Americans expect one to touch their babies when one looks at them. If one does not, they may be worried and even ask that this be done out of fear of the evil-eye which might have developed in the baby. In certain parts of Mexico, special charms are placed around an infant's neck to guard against the evil-eye. The power of EC may also be seen in the cosmology of the Bushmen in Southern Africa who believe that women ought to avoid EC with men during menstrual period. It is believed that her glance can not only fix men in whatever position they happen to be in, but may even permanently transform men into trees that talk (Greenacre, 1926). Edwards, Jainarain, Randeree, Rzadkowolski, and Wessels (1982) studied conversion disorders among Zulu psychiatric patients at a South African (Durban) hospital and found that 78% of these patients believed that their mental problem was caused by their traditional beliefs and/or had consulted traditional practitioners (izangoma) before coming to the hospital. Whisson (1964) observed

that "a psychiatrist working within a framework of reference that excluded spirits (superstition) would have great difficulty in curing any patient who believes himself attacked" (p. 304). Therefore, professionals who work with multi-cultural mental health clientele may find it necessary and useful to be mindful that eye contact's meaning may change from one society to the other and that the personality attributes presently observed to be linked to MEC may also shift if the belief systems of cultures are widely divergent.

EC may also have an important role in the treatment of psychological problems. Stevens and Long (1982) hypothesized that there would be a positive correlation between EC and self-assertiveness. They then trained participants in this skill and found that increased self-assertiveness was accompanied by more EC. In a similar vein, Johnson, Gross, and Widman (1982) used the Diabetes Assertiveness Test (Gross & Johnson, 1981) to measure social coping skills in adolescent diabetics. They found that participants maintained more mutual gaze with the experimenter after they had learned how to cope with their illness than before they developed these skills. However, further research is still required to confirm these findings, although it seems clear that eye-to-eye interaction appears to have some implications for psychological treatment.

EC in Field Studies

In their study, Gielen, Dick, Rosenberg, Kelly, and Chiafettelli (1979) used a naturalistic observation approach. They hypothesized that conversing White dyads would maintain more EC than Black dyads. They studied 49 pairs of individuals who were either students or faculty of York College, an undergraduate institution which is part of

the City University of New York system. Participants were observed for two-minute intervals while they freely interacted in a student lounge, unaware that their behaviors were being monitored. Dyadic participants were sitting no more than one meter away from each other. The observer was seated two to five meters away from the dyad. The observer used a stopwatch to measure the amount of EC during an interaction interval of two minutes. EC was defined as any event during which dyadic partners looked at each other directly face-to-face with heads parallel to each other. The prediction was supported. This finding agreed with LaFrance and Mayo's (1976) observation that during conversational interactions, Whites look more at each other than Blacks do. Gielen, et al.'s (1979) study and the current work are similar in that both endeavored to examine the role of EC from a naturalistic point of view. However, the present investigation is different in that (a) it did not employ any observers since participants themselves estimated mutual eye contact (MEC), and (b) MEC was defined as an event in which individuals stated they had looked at their partner's eyes while communicating verbally or silently.

Participants' initial subjective MEC estimates were quite high in Hadebe's (1983) prior study. Their subsequent MEC estimates declined sharply and also tended to stabilize. Thus, after 6-, 28-, and 49-hours of group interaction the MEC estimates of partners X and Y averaged 32 and 22, 12 and 5, and 7 and 5, seconds, respectively.

Interpersonal Measures

Exline (1963) found that women with a high need for Affiliation maintained more eye contact (EC) when talking than did women with a low need for Affiliation. This finding was supported by Exline, Gray,

and Schutte (1965) who found that persons high on Affection measures from Schutz's (1958) Fundamental Interpersonal Relations Orientation (FIRO-B) test had more EC with interviewers than did participants low on FIRO-B's Inclusion and Affection dimensions. However, Kendon and Cook (1969) later reported that "of 90 correlations involving FIRO only five were significant, almost exactly what would be expected by chance. There was no tendency for Affiliation, wanted or given, to be related to amount of looking" (p. 493).

Gray (1971) also used FIRO-B to investigate the amount of EC as a function of individual's need for Affiliation, need for Dominance, and sex. He found that dominant women maintained more EC with an interviewer than did dominant men. In both cases this happened regardless of interviewer's sex. However, highly dependent persons (male or female) maintained equal amounts of EC with the interviewer, independent of the latter's gender. No correlation was found between FIRO-B Affection need and the amount of interviewer-participant EC.

Efran and Broughton (1966) studied the effects of expectancies for social approval, as measured by the Crown-Marlowe (1964) scale, on visual behavior. They found positive correlations between need for approval and amount of EC. However, Efran (1968) was unable to replicate this result. Thus, Ellsworth and Ludwig (1972) concluded that "the relationship between Affiliation/Inclusion/Approval need and eye contact continues to be dubious, and probably depends largely on some third variable, such as the subject's expectations of approval" (p. 381).

Mobb (1969) investigated EC and introversion-extraversion. He found that extraverts maintained more EC than introverts, whether talking or listening. Argyle (1969) observed that dominant and/or

socially poised individuals looked more at others' eyes than did submissive or socially anxious persons.

Exline and Messick (1967) investigated relationships between dominance-dependence orientation and social reinforcement on one hand, and the amount of EC on the other. They used FIRO-B's Control scales to differentiate between dominant and dependent participants. Their results showed several interactions. Dependent persons showed more EC with interviewers when given low (as compared to high) amounts of verbal social reinforcement. Their EC was also higher than that of the dominant persons when given the same amount of such reinforcement.

In view of these many tentative and sometimes conflicting findings, there is a need for a more extended look at how eye contact relates to interpersonal behavior. Wiggin's (1982) comprehensive review of the interpersonal literature identified only two principal dimensions, labeled Affiliation and Dominance, as salient. Consequently, the present work selected conceptually related measures from the personality literature that appear to represent these central dimensions.

Criticisms of Laboratory Studies

Several investigators have criticized the introduction or inclusion of experimental conditions in eye contact (EC) studies during interpersonal communication. Libby (1970) commented that

> Often an experimental situation is employed in which a confederate or the experimenter stares the subject in the eyes throughout the course of their interaction [Exline, Gray, & Schuette, 1965; Exline & Winters, 1965]--an unnatural situation which may elicit unnatural responses (pp. 303-304).

This observation was not only supported but also expanded by Argyle (1971) who further maintained that

> Artificial laboratory experiments [which investigate natural and social systems] are always in danger of creating situations that do not occur in the real world and hence generating misleading results (p. 296).

In attempts to create strict experimental conditions, researchers have labored unsuccessfully to discriminate and assess eye gazes (EG's) from non-EG's in natural and spontaneous interpersonal interaction. To solve this problem, Vine (1971) suggested that naturalistic approaches might yield more meaningful results. He reminded researchers that

> In natural interactions we either give EG's or we look at other target in the head region rather rarely. If this is the case, then observers need only be able to discriminate which is FGs [Facial Gazes] from non-FGs [non-Facial Gazes], which is relatively an easier task (pp. 328-329).

Exline and Fehr (1978) agreed with the notion of minimizing experimental manipulations in EC research as much as possible. However, they strongly objected to introducing independent observers. They believed that eye gaze is called eye contact only if it has some meaning to the receiver or observer who is part of that mutual eye contact. This argument suggests that the measurement of EC in such research might better be done directly by the receiver, rather than someone external to that particular eye-to-eye interaction.

In a similar vein, Duncan and Fiske (1977) viewed eye-to-eye interaction as a "natural social system" (p. 11), the investigation of which cannot be divorced from its purely spontaneous character. They were aware that "limitations on the naturalness of interactions used for such research stem from both research requirements and considerations of ethics" (p. 25). However, they strongly argued that EC research should be "an attempt to study interaction in as natural a form as possible" (p. 25). They further maintained that

holding artificial intervention to a minimum ought to be a highly desirable goal in any study of natural phenomena. These are some of the researchers who criticize experimental conditions in EC studies in favor of less artificial approaches.

Naturalistic Studies

Hadebe's (1983) work endeavored to accommodate criticisms levelled against laboratory-based eye contact studies in favor of a naturalistic approach. The author investigated mutual eye contact (MEC) in dyadic partners of small interpersonally oriented groups, using an Estimate of Mutual Eye Contact in Seconds (EMECS) measure (Hadebe, 1983). He found that dyadic partners' raw MEC estimates often differed sharply, indicating that EMECS yielded little dyadic agreement and high variability. Raw MEC estimates also evidenced little stability over time, as the correlations of individuals' MEC estimates from one observation to the next for a given partner were generally quite low (mean $\underline{r}$ = .17). To achieve a more stable measure, these raw estimates were transformed into percentages that were found to yield notably lower variability among individuals and dyads as well as being intrinsically more stable for the individual (each person's total MEC with all partners was fixed at 100 percent) across all groups and occasions. The correlations among individuals' percentage MEC estimates over time in a series of six different groups averaged modestly higher (mean $\underline{r}$ = .32) than the corresponding .17 value for raw estimates, although about 90 percent of the differences among each partner's estimates remained unrelated to the other's.

Hadebe found a strong positive linkage between partner's Liking and their percentage MEC estimates despite the restricted temporal

stability of measures of both MEC and dyadic Liking. These findings augmented tentative evidence of the validity of these subjective MEC estimates that rested upon interpartner agreement. The positive liking-MEC correlation found by this study between subjectively-estimated MEC agreed with independent evidence from diverse laboratory-based studies (Mehrabian, 1968; Exline, 1963; Kleinke, Deautels, & Knapp, 1977; Duncan, & Fiske, 1977).

Effects of Familiarity, Training, and Feedback

Some important sources of instability in subjective MEC estimates that might be reduced were also observed in Hadebe's (1983) study. Familiarity was one such factor that appeared to significantly effect the estimates. At least two types of familiarity seemed pertinent: (a) interpartner (person) familiarity; and (b) familiarity with the method of making mutual eye contact estimates (task or method or instrument familiarity). It is not easy to say which of these played the major role. The first type was defined by the number of hours that group members had spent together during a series of meetings of small groups. Apparently both types contributed, along with other variables, to reduce individuals' MEC estimates after the initial trial. Thus, the 6-, 28-, and 49-hour MEC estimates of partners X and Y in one group averaged 64 and 46, 21 and 18, and 8 and 7 seconds, respectively. Familiarity appeared to have appreciable impact in the sense that MEC estimates regularly declined. It is not clear whether estimates would have continued to remain the same, or rise or fall, had levels of this variable been controlled.

Hadebe's (1983) work was also relatively uncontrolled in the sense that the instructions and preparations for administering the

EMECS measure varied from group to group. Participants in one group, whose leader improvised a preparatory five-second MEC estimation exercise, made relatively low MEC estimates that also showed reasonably high temporal stability, whereas other groups that received no preparation for initial estimates yielded generally higher values that were less stable over time. It remained unclear whether MEC estimates would be about the same, or rise or fall, if preparation and/or training were better controlled.

Familiarity and preparation were further confounded, however, with feedback. Individuals' initial MEC estimates, when participants were still relatively naive and inexperienced in MEC estimation, were much higher than their estimates after receiving feedback about interpartner discrepancies in their prior estimates. The author's work suggests that feedback about initial incongruities in partners' MEC estimates can improve the meaningfulness of the partners' estimates. This feedback apparently had appreciable impact in the sense that MEC estimates declined sharply. It was unclear that this would have happened without feedback. Thus, the present investigation proposes to further explore how subjectively-estimated MEC relates to familiarity, training, and feedback on MEC estimation.

Another goal was to better appraise how these MEC estimates relate to interpersonal behavior within the context of small, loosely structured naturalistic groups. Because of conflicting earlier reports previously noted, it seems important to select personality measures that represented major dimensions of interpersonal behavior rather than isolated variables whose meaningfulness is less settled. Consequently, three measures were chosen: (a) Hurley's (1978) ratings of interpersonal behavior in small groups that feature measure of Acceptance versus

Rejection of Self (ARS) and Acceptance versus Rejection of Others (ARO); (b) Schutz's (1958) FIRO-B which relies wholly upon self-reports; and (c) Lorr and McNair's (1967) extensive Interpersonal Behavior Inventory (IBI) that provides for ratings from both self and group peers. Wiggin's (1982) report regarded the IBI as a promising measure of the Affiliation and Dominance dimensions. The rationale for selecting these tools for the current study will be documented subsequently (see section on "Measures") when data concerning their validity and reliability will be reviewed.

Given this background, the current study intends to explore the effect of treatments (Training & Feedback or T+F, Training only or T, & Naive or N) on MEC estimates within the context of small groups of peers attending their own interpersonal behaviors. These data will be collected on four occasions (Times I, II, III, & IV) spaced at roughly equal intervals throughout the 20 regularly scheduled meetings of these groups and representing increasing degrees of familiarity. Referring to estimates of MEC that are self-based ("given") and that originate with each other group member ("received"), two types of MEC data will be considered. The linkages of these MEC estimates to selected personality measures will also be examined.

HYPOTHESES

1. Hadebe (1983) observed that MEC estimates collected at low familiarity (6-hours) consistently exceeded those made later (after 28- & 49-hours). In the current study it was hypothesized that levels of task-interpartner familiarity (low, modest, moderate, & high or at Times I, II, III, & IV) would significantly influence self-based estimates of mutual eye contact (MEC). Initial estimates were expected to be higher than subsequent ones.
2. In Hadebe's prior work, the incidental unstructured training in MEC estimates provided by some groups had confounded the results by decreasing and stabilizing MEC estimates. Consequently, it was predicted that divergent treatments (Training & Feedback or T+F, Training only or T, and Naive) would differentially effect self-based MEC estimates and that these estimates of the T+F, T, and Naive groups would be low, medium, and high, respectively.
3. The mean MEC estimates that individuals give ("self-based") and receive ("partner-based") from all other members of their small group will show interoccasion stability at higher familiarity levels by correlating positively at Times III versus IV.
4. Treatments will significantly effect correlations of mean partner-based MEC at moderate (III) and high (IV) task-interpartner familiarity levels. Across these two occasions, there would be stronger linkages for the combined Training and Feedback (T+F) groups versus moderate and weaker (perhaps nonsignificant)

interoccasion stability, respectively, of individuals' MEC estimates among the Training and Naive groups.

5. Training plus Feedback will yield more significant correlations between individuals' interoccasion MEC estimates, self- or partner-based, than would either Training only or no training at all (Naive).
6. The correlations of dyadic partners' (interpartner agreement) MEC estimates would be positive and stronger at the later occasions (III & IV) than earlier (I & II).
7. Treatments will significantly effect interpartners' MEC correlations at higher (III & IV) task and partner familiarity. Thus, at Times III and IV, interpartner correlations of composite treatment groups that received Training and Feedback, Training in MEC estimation only, and no training would be high, moderate, and low, respectively.
8. Several studies of relationships between eye contact and personality variables were reviewed. Considering their rather mixed outcomes, an overview of this sector will be sought by examining MEC estimates' linkages to measures of the central dimensions of interpersonal behavior. It is hypothesized that these MEC-personality correlations will be clearer and stronger among those groups provided the Training and Feedback (T+F) presumed to enhance the validity of MEC estimates, than among those groups (Training only and Naive) likely to make less valid MEC estimates.

METHODOLOGY

Participants

The persons studied were advanced undergraduates in groups oriented toward strengthening interpersonal communication skills. Participation in these groups was the principal ingredient of a non-required 400-level psychology course at Michigan State University. Enrollment was open to juniors and seniors from any major. Members of eleven groups (73 persons: 29 men and 44 women) contributed to the data collections.

Interpersonal Groups

These groups were primarily educational, rather than psychotherapeutic, in nature. Their main function was to provide a favorable climate in which group members could examine and possibly enhance their interpersonal skills. These included learning about and expressing empathy, understanding, feelings, caring, warmth, acceptance, and confrontative skills. After every session each participant wrote separate paragraphs that described his/her own experiences with, behaviors toward, feelings about, and plans for relating to each other group member. Called the group "log," these written accounts were regularly reviewed by the instructor and served as the principal base for students' grades. Each participant was also required to describe his/her perception of self and every other group member twice each term on a series of behavior ratings. Precise and complete feedback

was subsequently provided on each set of ratings. This included a comparison of self-ratings with how each other member of that group had rated the individual. These comparisons highlighted similarities and differences between how each member rated himself/herself and how s/he was rated by others.

Each group held two 90-minute sessions weekly plus twelve-hour long (marathon) sessions near the term's third and seventh weekends, totalling about 50 hours of experiential meetings over nine weeks. Due to members' divergent class schedules and prior time commitments, it was not possible for all groups to hold marathon sessions in the same sequence. Thus, for some groups marathon I constituted their fifth session, while it was at other groups' seventh session. Similar considerations applied to the second marathon. Each group was led by an undergraduate facilitator or duo who had at least one prior term of training in group leadership skills in addition to earlier participation as a group member. Apart from these small group sessions, all facilitators and leader trainees met with the course instructor for a weekly two-hour staff meeting.

Measures

This study employed four principal measures:

1. Hadebe's (1983) Estimate of Mutual Eye Contact in Seconds (EMECS, see Appendix A). This instrument was jointly developed by the researcher and his faculty advisor, Professor John R. Hurley. Its purpose was to yield estimates of the amount of perceived MEC that participants had maintained with one another during selected group sessions.

2. Group Behavior Ratings. This personality instrument consists of eight subscales. Four measure Acceptance versus Rejection of Others or ARO (Warm--Cold, Helps others--Harms others, Gentle--Harsh, Accepts others--Rejects others), and four measure Acceptance versus Rejection of Self or ARS (Shows feelings--Hides feelings, Expressive--Guarded, Active--Passive, and Dominant--Submissive). Both ARO and ARS are preceded by a Liked--Disliked rating. These nine scales constitute an instrument which claims to assess the two principal dimensions of behavior (Hurley, 1978; Hurley & Rosenthal, 1978).

Several studies have supported the construct validity of these ratings of behavior within small groups. ARO and ARS has been consistently found to correlate significantly and differentially with other measures of Wiggin's (1982) Affiliation and Dominance dimensions. Gerstenhaber (1974) studied correlations between LaForge and Suczek's (1955) LOV (Affiliation) and DOM (Dominance) factors. Using self-ratings, he found that DOM correlated .70 ($p < .001$) with ARS and .18 with ARO, while LOV correlated .55 ($p < .001$) with ARO and .00 with ARS. Near the end of groups similar to the present series, Hurley (1983) administered Lorr and McNair's (1967) Interpersonal Behavior Inventory (IBI) to six small experiental groups' 47 undergraduate members who had previously made ARS and ARO ratings after about 22- and 45-hours of group interaction. Peers' mean ARS ratings correlated positively (.41 & .63) with their ratings of individuals on the IBI's five-scale Dominance factor but inversely (-.39 & -.44) with its four-scale Intropunitive factor. Neither IBI factor correlated significantly with comparable ARO ratings, although ARO correlated strongly (.73 & .74) with IBI's remaining six-scale Affiliation factor. IBI's Hostility and Competitiveness scales

(which correlated .71) linked positively to ARS but negatively to ARO on each occasion. Three of the four correlations of both Hostility and Competitiveness with ARS and ARO were statistically significant (above ± .36).

All nine scales were presented in a booklet with instructions on the front page. The instructions asked each member to (a) rate himself/herself and each other group member on a continuum of 0 to 9 for each subscale, and (b) base these ratings upon his/her personal impression of each person's behavior within this group (Hurley, 1978) over all prior sessions including marathons.

In a subsequent regular group session within the next seven to ten days, each group participant received a matrix of ratings on each subscale and composite (ARS & ARO), showing how s/he rated himself/herself and s/he was rated by others. Also provided to each person, was a graphic summary that fully depicted discrepancies between self- and peer-based ratings. These discrepancies were shared and discussed within each group (feedback) to encourage interpersonal communication and to heighten their awareness of how others perceived their interpersonal behavior.

3. Schutz's (1958) Fundamental Interpersonal Relations Orientation (FIRO-B). This instrument purports to measure the interpersonal needs of Control, Inclusion, and Affection as defined by Schutz (1966). FIRO-B contains separate scoring keys for needs expressed and wanted (from others) of each type. This tool was selected for the current study because it claims to assess the most important dimensions of interpersonal behavior and thus promises to contribute meaningfully to our understanding of the relationship between eye contact and interpersonal behaviors. The claims of

satisfactory validity (Schutz, 1967) for this instrument have been supported in several other works. Goulding and Knudson (1975) studied multivariable-multimethod convergence in the domain of interpersonal behavior. They found a close relationship between Schutz's (1958) Control, Affection, and Inclusion factors and Lorr and Suziedelis's (1969) Control, Nurturance, and Detachment versus Sociability measures. These investigators also indicated that, although their semantic labels differed, both sets of measures agreed with theoretical notions about the structure of interpersonal behavior advanced earlier by Leary (1957) and LaForge (1963), as well as with LaForge and Suczek's (1965) Interpersonal Check List. According to Schutz (1967), the average internal consistency (reliability) coefficient of the six FIRO-B scales is .94.

4. Lorr and McNair's (1967) Interpersonal Behavior Inventory (IBI). This instrument was selected for the current study because it was designed to measure the main manifest reactions to interpersonal behavior and there is substantial preliminary evidence (Wiggins, 1982) that it does that. "To identify some of the more prominent interpersonal situation-dimensions that evoke interpersonal responses [and] to identify the main manifest reaction dimensions in the interpersonal domain" (p. 446), Lorr, Suzedelis, and Kinane (1969) conducted a study which included selected IBI measures (Hostility, Nurturance, Sociability, etc.). They found that individuals made different responses to similar stimulus-situations, depending upon their needs.

Using Lorr and McNair's (1967) personality scale to measure Nurturance--a personality trait similar to Schutz's (1958) Affection expressed and wanted--Libby and Yaklevich (1973) found that

participants high in Nurturance maintained more eye contact with a confederate than did persons low on this dimension. This observation was supported by Mehrabian's (1971b) report that individuals high in need for affection looked more than those low in this need.

Lorr and Suzedelis's (1969) study sought to: (a) determine the higher-level factors measured by IBI scales, and (b) compare the structure found with Schutz's (1958) concepts. A composite measure constituted by IBI scales of Nurturance, Agreeableness, Affiliation, and Deference appeared similar to Schutz's need for Affection. FIRO-B's "expressed" and "wanted" needs of each variety were aggregated in this study. IBI's summed scales of Dominance, Competitiveness, Hostility, Exhibition, and Sociability agreed with Schutz's need for Control while IBI's Detachment and Inhibition (Shyness) scales were found to parallel Schutz's Inclusion needs. Confirmatory findings were reported by Bochner and Kaminski (1974).

IBI's validity has been supported by several studies. Lorr and McNair (1965) found that although this instrument was developed from professionals' ratings of patients, it yielded similar results when college students were asked to rate their acquaintances. Wiggins (1982) compared the IBI with several other interpersonal behavior measures, including Leary's (1957) circumplex and Schutz's (1958) FIRO-B. He concluded that "on both substantive and psychometric grounds, the Interpersonal Behavior Inventory appears to be a useful clinical device for assessment of patient characteristics and evaluation of therapeutic outcomes" (p. 15).

ARS and ARO, FIRO-B, and IBI were utilized in the current study since they appear to not only assess the central dimensions of interpersonal behavior but they also share a common goal of trying to

comprehensively appraise the interpersonal features of personality in the sense of attending to its salient aspects. Additionally, these scales complemented one another in the sense that FIRO-B assesses interpersonal behavior only as perceived or experienced by the individual himself/herself while ARS and ARO and IBI appraise related attributes as perceived by others as well as by self.

Procedure

At the beginning of the Spring and Fall terms of 1983, all PSY 400 course enrollees met in one classroom. They were asked to form small groups of about seven relatively unacquainted persons who could regularly meet for two 90-minute small group sessions each week. It was also emphasized that each group should have an equal number of females and males, if possible. Consequently, 11 groups (seven in Spring & four in Fall) were formed. Each term's groups were randomly assigned to three treatments: three groups received Training and Feedback in MEC estimation, four Training only, and no training was given to the remaining four.

Training Exercises

These exercises were intended to enhance the likelihood of valid MEC estimates by members of the selected groups. There were two types of exercises.

1. Facilitators' Exercises. These preceded the initial session of all participating groups (See next section b). It involved only the facilitators of those groups randomly selected for MEC estimation training. These facilitators had just met with the course instructor

and other course staff for 110 minutes to discuss general issues pertinent to conducting interpersonal growth groups. Immediately following this meeting, all facilitators of those groups not scheduled to receive MEC estimation training were excused. Those who remained were then asked to complete the EMECS with reference to the preceding 110 minute meeting. The researcher explained that their MEC estimates should be based wholly upon experiences during that 110 minutes. As a final instruction, the investigator also clarified and emphasized that these MEC estimates were not an effort to evaluate or judge how individuals had communicated during the target period. Rather, it was an attempt: (a) to explore their interpersonal communication, and (b) to provide an exercise preparatory to administering the EMECS within their respective small groups. EMECS forms were collected from these facilitators upon their completion.

Estimations of MEC from all of these selected group facilitators were combined in matrix format on a single card. This matrix displayed how each partner rated the other member of all possible dyads, as shown in Figure 1. Dyadic partners were arbitrarily designated X and Y. Thus, each pair had two related estimates, namely, X's of MEC with Y, and Y's of MEC with X. For example, Figure 1 shows that Mark's (Y's) estimate of his MEC with John (X) = 35 (first value, first row), while John's (X's) estimate of his MEC with Mark (Y) = 24 (first value, second row).

The investigator encircled the estimates of the dyad(s) having the greatest MEC estimate discrepancies and triangulated the estimates of dyad(s) least discrepant, as also depicted in Figure 1. The facilitators of those groups randomly selected for both training and feedback were requested to attend an additional special meeting

		Person X: Estimatees								
	PERSON Y	Mark	John	Leslie	Suzie	Paul	Lisa	Marie	Dan	Σ Given
ESTIMATORS	Mark	·	35	5	2	△2	○0	15	9	68
	John	24	·	6	0	8	2	10	0	50
	Leslie	1	4	·	8	△1	2	4	△1	21
	Suzie	0	3	6	·	2	2	10	3	26
	Paul	△3	4	△1	5	·	1	2	10	26
	Lisa	○30	8	10	19	5	·	4	○33	109
	Marie	1	3	0	2	6	2	·	2	16
	Dan	4	3	△1	1	2	○4	4	·	19
	Σ Received	63	60	29	37	26	13	49	58	335

△ = Least or no discrepancies

○ = Greatest discrepancies

Figure 1. Participants' MEC Estimates of One Another for T+F groups

with the researcher to exemplify constructive feedback. At this meeting each facilitator received a feedback form that displayed all MEC estimates attributed to ("given") each partner as well as those assigned by ("received from") partners in addition to the total estimates "given" by each individual in that group, as illustrated by Figure 1. This format provided each participant with full information about the discrepancies between her/his own MEC estimates and those of all possible partners. Unstructured general discussion of these data and a review of factors that might have contributed to these discrepancies followed. These discussions rarely lasted longer than ten minutes.

2. Exercises for Training Groups. These sessions were conducted by those facilitators whose groups had been selected for training in MEC estimations. They were asked to administer the EMECS toward the end of about the fourth session of their group. The fourth session was chosen for this training intervention because it was believed that by this time these groups had largely stabilized in terms of membership and member's comfort with the group format (see p. 13). The researcher emphasized that each facilitator should stress that MEC estimates were not meant to evaluate how group members communicated with each other immediately before circulating the EMECS report form to members. Instead, the EMECS was described as another avenue for exploring interpersonal communication and growth. Details of the instructions for this exercise are as given in Table 1.

Estimations of MEC from all members of each group were assembled in a matrix format on a separate card for each group. The researcher then identified the least and greatest discrepancies, as earlier shown in Figure 1. Toward the close of each group's next session,

Table 1. MEC Training Exercise

Instructions:
(To be given by one facilitator)

1. "At this stage of today's session, we will depart from our usual procedure."

2. "Arrange yourself in facing pairs, selecting partners who do not typically look at each other a lot."

3. "I will ask you to look into each other's eyes for a few seconds. Do not begin until I give you a cue. I will also tell when you are to stop. Does everyone understand?" Repeat instruction #3 once.

4. Then say: "Get ready, (pause briefly) begin."
(Count to yourself at normal speed: "One Mississippi, Two Mississippi, Three Mississippi." Then say "Stop.")

   Next say, "That was a three-second interval. We did this brief exercise to help you make reasonable estimates of your total seconds of mutual eye contact with each other person in this group during the previous 85 minutes of today's session. Exclude this three-second exercise from your estimates.

5. Ask them to return to their original seats. Give an EMECS copy to each. Read instructions preceding the EMECS page aloud. Then tell them that these mutual eye contact estimates must include their 3-second exercise. And stress that they must be based upon eye-to-eye contact.

   (In case a member has no partner, one facilitator should act as a partner. The other facilitator, if any, should monitor this exercise.)

   When they are through, collect EMECS forms.

every member of those groups selected for training and feedback on MEC estimation received her/his own copy of that group's MEC data. The feedback form displayed all self-based ("given") and partner-based ("received") estimates as well as the total estimates that each member "gave" to all others. This oriented each participant toward his/her MEC estimates and interpartner discrepancies. A five- to ten-minute general discussion of these data and a review of factors that might have contributed to these discrepancies followed. Details of instructions for this feedback are given in Table 2. Facilitators of each MEC training group also submitted brief written accounts of their respective groups' comments on, and reactions to, MEC estimation and/or feedback.

As a second part of this training exercise, the facilitators of groups assigned to MEC estimate training readministered EMECS toward the close of about their eighth session. The researcher again arranged all MEC data of that group in a matrix format like before. Toward the end of these groups' next regular session, participants of those groups assigned to the training and feedback condition again received copies of all MEC feedback pertinent to that group. Feedback sessions were again conducted.

Collection of Data

Estimations of MEC were later collected from designated interpersonal groups, each of which eventually met for a total of about 20 sessions. Facilitators readministered the EMECS for a third occasion to these groups after each group had convened for a total of about 25 hours. Three groups continued to receive both Training and

Table 2. Instructions for Feedback Exercise

Instructions:

To be given:

a) by a facilitator to his/her group members during the last 15 minutes of the subsequent regular session.

b) only to the groups that are selected for pretraining and feedback on mutual eye contact.

1) "Once more, at this stage of our today's session, we will depart from our usual procedure."

(The facilitator then hands out sheets similar to Figure 1 tailored to that groups' MEC data that were prepared by the researcher.)

2) "Here is the summary of your latest mutual eye contact estimates."

Please note the following:

a) This instrument is not intended to evaluate or judge the quality of your communication, but merely to provide some information about your communications with others within this group. This may be useful to you and other group members in better understanding the communication events within this group.

b) All estimates given are depicted across the page (horizontally) while estimates received from others are shown in columns (vertically). Do you understand this?

c) A circle indicates greatest discrepancies between partner's estimates.

d) A triangle indicates least or zero discrepancies.

(Repeat, if necessary.)

(The facilitator then opens discussion by saying:)

3) "Check with whom your mutual eye contact estimates have the

a) greatest discrepancies. "Could you think of factors that might have led to this?"

b) least discrepancies. "What do you think might have led to this?"

(At the end of the discussion, group members will be allowed to keep these MEC data sheets for further review, if they wish.)

Feedback in MEC estimation, four other groups continued to receive Training only, while the other four groups received no treatment. Facilitators of the last four groups were now asked to initially administer EMECS to their respective groups according to the Table 3 instructions.

Estimations of MEC from all participants of each group were assembled in matrix format. MEC estimates of groups assigned to training and feedback were again annotated for feedback. Towards the end of that group's next regular session, each participant again received a copy of the pertinent feedback form. The feedback process was repeated. A similar MEC data collection occurred near a late but pre-final group session, usually the 18th, or after each group had met for about 49 hours. No feedback was provided at this point due to the impending end of the term.

Overview of Data Collections

After the Time III MEC data collection, information about each participant's self-perceived interpersonal behavior was collected by administering Schutz's FIRO-B (1958). After each group's initial session post-marathon II, following about 43½ hours of group participation, Lorr and McNair's (1967) Interpersonal Behavior Inventory (IBI) was also made available to all participants on a voluntary basis. Group members were given the option of filling out this instrument describing themselves and every other group member as an alternative to writing their required group log entries for two sessions. All group leaders were also asked to complete the IBI without options. Respondents completed the IBI at their own time

Table 3. Instructions for EMECS Administration without Training

(To be given by one facilitator toward the end of the group session.)

Please: (a) Strictly adhere to these instructions,
(b) Do not give any additional instructions,
(c) If participant(s) ask(s) you some questions, just repeat the instruction(s) verbatim.

1. Begin by saying:

"At this stage of today's session, we will depart from our usual procedure."

(Give an EMECS copy to each group member.)

2. Then read instructions preceding the EMECS page aloud.

3. Then say: "Please note:

(a) that your estimates must be based upon eye-to-eye contact, and

(b) that they should be in seconds."

4. When they are through, collect the forms.

schedule outside the classroom and generally returned it near the term's end or about two weeks later. They estimated that it required about three hours to complete the IBI's 140 items for self plus the six other persons that typically constituted each group.

Early Group Behavior Ratings were administered to all groups near their seventh session (before Time II MEC estimates). About ten days later, near session 10, feedback on these ratings was provided and informally discussed within the assigned groups. The same process was repeated shortly before the Time IV estimates. An overview of all data collection phases and times is presented in Table 4.

Sample Characteristics

Consistent with their voluntary selection of enrollment in this very atypical 400-level PSY course, it seems likely that this sample was more interested in interpersonal behavior than most upper-level MSU undergraduates. It did include, however, a wide variety of other majors. Of 60 group members (excluding group facilitators) 33 (55%) were psychology majors while 27 (45%) others represented a wide variety of non-psychology majors or a broad spectrum of non-social science majors ranging from business to mathematics and engineering. The participants seemed generally cooperative in supplying data, and one group facilitator observed:

> I believe the group enjoys this task (MEC estimations) for various reasons, not the least of which is that feedback is always appreciated. . . . During the feedback session, folks freely talked about their impressions and often took responsibility for "unreasonable" estimates.

This 73-person sample appeared generally similar in interpersonal ratings to Blank's (1984) 88-person sample drawn from the same

Table 4. Overview of Data Collection Phases and Times

Weeks	I		II		III		IV		V		VI		VII		VIII		IX		X	
Group Sessions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Interventions																				
1. MEC Training & Feedback				A				B				C				D				
2. MEC Training Only				A				B				C				D				
3. Naive												C				D				
Personality Data (All groups)																				
1. ARS/ARO							X_1			X_1F							X_2		X_2F	
2. FIRO-B																Y				
3. IBI																		Z		

A = Initial MEC estimate (7 groups).

B = Second MEC estimate (7 groups).

C = Third MEC estimate (11 groups).

D = Fourth MEC estimate (11 groups).

X_1 = early ARS/ARO data collection (all groups).

X_1F= Feedback on early ARS/ARO.

Y = FIRO data collected in general class meeting

X_2 = Late ARS/ARO data collection (all groups).

X_2F= Feedback on late ARS/ARO.

Z = IBI forms circulated (all groups).

course in other recent terms. On other personality measures related to Bem's (1975) widely-used sex-role preference measures, Blank found that her sample of PSY 400 participants did not differ significantly from other much larger samples of MSU undergraduates. Thus, this limited information suggests that the present sample was probably not remarkably different from the broad spectrum of university undergraduates in terms of general personality features. The results of this study may be limited by the somewhat protected miniculture of these young adults in an academic setting despite this quite naturalistic approach to assessing MEC. Without further research the present findings cannot be confidently generalized beyond MSU's undergraduate population.

Mean scores on the personality measures for the current sample did not grossly differ from other pertinent samples. Table 5 shows these differences for prior college student samples of Blank (1984), Lorr and Suzedelis (1969), and Schutz (1955). Inspection of these data reveals several points of interest. The present 73-person sample's means for ARS and ARO generally moderately exceeded Blank's for unknown reasons. Both studies were based upon MSU undergraduates enrolled in PSY 400 and were conducted only a year or two apart. The differences between the present means and those of Lorr and Suzedelis's (1969) for the IBI were small despite their sample's much larger size ($\underline{N}$ = 290). The mean of Schutz's (1958) small FIRO sample sometimes exceeded and sometimes fell below the present means. The only notable FIRO differences were the present group's higher scores on Affection wanted and lower scores on Control expressed. The 25 years separating these two data collections leave the meaning of these differences uncertain, although it seems appropriate that members of the present groups that focused

Table 5. Personality Comparisons of Present Sample with Pertinent Prior Studies: Means, Standard Deviations, and Differences.

			Present (N = 73)		Prior Studies*		Mean Difference
			Mean	SD	Mean	SD	
RATINGS OF BEHAVIOR	ARS: Self	Early	24.90	(5.94)	25.08	(6.31)	-0.18
		Late	27.07	(4.45)	26.62	(5.67)	0.45
	ARS: Peers	Early	23.54	(6.57)	21.95	(6.72)	1.59
		Late	26.00	(5.13)	24.21	(5.48)	1.79
	ARO: Self	Early	27.12	(4.81)	26.00	(5.66)	1.12
		Peers	27.63	(4.80)	26.82	(4.67)	0.81
	ARO: Peers	Early	27.61	(4.66)	25.55	(3.93)	2.06
		Peers	28.46	(3.82)	26.58	(3.50)	1.88
IBI:		Control	19.86	(0.39)	19.65	unknown	0.21
		Affection	24.09	(0.34)	23.75	unknown	0.34
FIRO	Inclusion	Wanted	5.27	(0.36)	5.4	unknown	-0.13
		Expressed	4.56	(0.24)	4.0	unknown	0.56
	Control	Wanted	3.03	(0.21)	3.4	unknown	-0.37
		Expressed	3.06	(0.26)	5.0	unknown	-1.94
	Affection	Wanted	6.34	(0.27)	3.6	unknown	2.74
		Expressed	5.09	(0.29)	4.9	unknown	0.19

*Blank's (1984) Ratings of Behavior prior sample had N = 88. For the IBI, Lorr and Suzedelis's (1969) sample had N = 290 for ratings by others but no self-reported data. Schutz's (1958) small FIRO-B sample had only N = 35.

upon acknowledgement of their feelings scored much higher on Affection wanted.

Personality self-ratings were not returned on FIRO by only two participants and ten chose not to complete the IBI ratings for both others and self. IBI ratings by a majority of their group peers (four or more others) were provided for all participants and used in the pertinent data analyses.

FINDINGS

Figure 2 and Table 6 show how the three "treatments" related to individuals' subjective mean raw MEC estimates. One extraordinary MEC estimate of 1200 seconds was judged invalid and excluded from subsequent analyses. It dramatically differed from that individual's partner's one second MEC estimate and exceeded the second highest estimate in this total sample of 1222 by over 900 seconds. Figure 2 shows how this "wild" estimate's inclusion would have altered the composite Training only group's Time II mean. Early, at low task-interpartner familiarity or occasion I, MEC estimates of both trained composite groups (T+F & T) were relatively high. As familiarity with task and partners increased, MEC estimates declined sharply but differentially. Thus, the combined T+F groups gave estimates of 15.1 and 5.9 seconds, respectively, for occasions I and II, plummeting 9.2 seconds or 61 percent. The comparable adjusted means of all T groups were 16.1 and 11.9 seconds, respectively, for a net decline of 4.2 seconds or 26 percent. The greater early decline of T+F groups over T groups was maintained at Times III and IV. Inspection of the occasion I means in Table 6 suggests that smaller groups tended to yield larger MEC estimates than larger groups, even though this association (r = .57) was not statistically significant at Time I. Excluding the distinctly larger MEC estimates of the two smallest groups did not materially alter Figure 2's findings. The hypothesis that early MEC estimates would exceed subsequent ones was

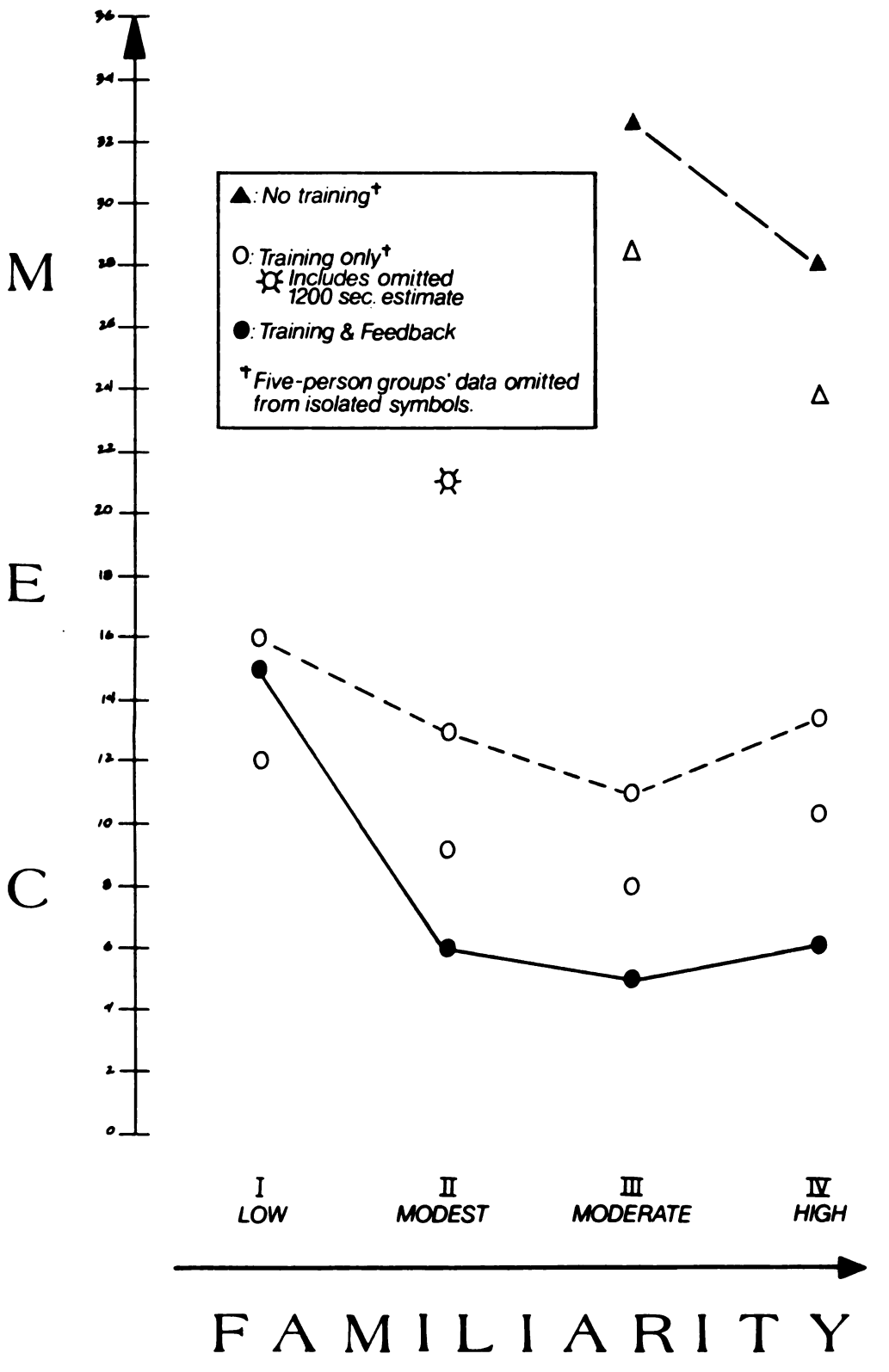

Figure 2. Composite Treatment Groups' Mean MEC Estimates on Each Occasion

Table 6. Individuals' Mean Seconds of MEC by Groups at Four Times and Related Changes

	N	TIMES				CHANGES					
		I	II	III	IV	I-IV	I-III	I-II	II-IV	II-III	III-IV
Training & Feedback (T-F):											
1(Sa)	7	16.9	7.9	5.7	5.6	11.3	11.2	9.0	2.3	2.2	0.1
2(Sb)	7	9.9	4.3	4.7	6.0	3.9	5.2	5.6	-1.7	-0.4	-1.3
3(Fc)	7	18.6	5.5	4.7	6.5	12.1	13.9	13.1	-1.0	0.8	-1.8
Total	21										
Composite		*15.1*	*5.9*	*5.0*	*6.0*	*9.1*	*10.1*	*9.2*	*-0.2*	*0.9*	*-1.0*
Training Only (T):											
1(Sc)	7	10.7	8.9	5.3	4.7	6.0	5.4	2.7	3.3	2.7	0.6
2(Sd)	9	13.7	13.1	9.2	14.4	-0.7	4.5	0.6	-1.3	3.9	-5.2
3(Fb)	6	10.7	5.4*	9.3	11.8	-1.1	1.4	5.3	-6.4	-3.9	-2.5
4(Fc)	5	35.2	22.9	23.5	26.3	8.9	11.7	12.3	-3.4	-0.6	-2.8
Total	27										
Composite[a]		*16.1*	*11.9*	*10.9*	*13.5*	*2.6*	*5.4*	*4.4*	*-1.6*	*1.0*	*-2.7*
Naive (N):											
1(Sd)	7			45.1	39.2						5.9
2(Se)	7			17.5	17.5						0.0
3(Fd)	6			21.7	20.9						0.8
4(Fe)	5			48.1	36.4						11.7
Total	25										
Composite[a]				*32.4*	*28.2*						*4.2*

[a]Means weighted for number per subgroup

*If the extraordinary 1200 second estimate had been included, this group's mean would have ballooned to 44.8 seconds. The corresponding adjusted T composite mean would have been 20.6 instead of the 11.9 listed.

plainly supported.

Table 6 also shows that, following their relatively high initial MEC estimates, most trained groups' raw MEC estimates tended to stabilize, especially for T+F groups. Their progressive mean estimates were 5.9 (II) 5.0 (III), and 6.0 (IV) seconds. Weaker stabilization occurred among the composite T groups, as shown by their adjusted mean estimates (in seconds) of 11.9 (II), 10.9 (III), and 13.5 (IV). The raw MEC estimates of T+F groups showed greater interoccasion stability and intergroup consistency than did those of T groups. The four Naive (N) or untrained groups showed distinctly less intergroup consistency and less stability from occasions III to IV. While their overall adjusted means of 32.4 (Time III) and 28.2 (Time IV) seconds remained reasonably close, group N #4's mean declined 11.7 seconds while group N #2's was constant. Overall, the combined Naive groups' MEC estimates were unusually high, perhaps reflecting their lack of both training and feedback. Treatments clearly differentially influenced the stability of MEC estimates, as hypothesized.

MEC Measures: Raw, Percentage, and ž-scores

For each of these three MEC measures, and separately by treatments, Table 7 shows all interoccasion stability correlations for mean partner-based ("received") MEC estimates. Percentage MEC estimates "given" were calculated by simply dividing the estimator's number of MEC seconds for each partner by her/his sum for all partners. Comparable correlations of mean self-based or "given" estimates are included only for raw seconds, as each individual within any given group gave a total of 100 percent to combined partners, rendering meaningless their related mean percentile and *z*-scores. To consider individuals' MEC estimates within

Table 7. Interperiod Stability Correlations for Individual's Mean Partner-based (Received) and Self-based (Gave) MEC Estimates at Four Familiarity Levels by Three Treatments in Raw Seconds, Percentage (%), and z-score Units†

			I: LOW			II: MODEST††			III: MODERATE		
			Raw	%	z	Raw	%	z	Raw	%	z
II:	T+F: (N=21)	Rc'd	43[c]	54[b]	38[c]						
		Gave	44[c]	-*	-						
	T : (N=27)	Rc'd	65[a]	-23	-6						
		Gave	50[b]	-	-						
III:	T+F: (N=21)	Rc'd	30	39[c]	38[c]	39[c]	33	40[c]			
		Gave	13	-	-	73[a]	-	-			
	T : (N=27)	Rc'd	76[a]	32	42[c]	72[a]	30	30			
		Gave	50[b]	-	-	71[a]	-	-			
IV: (HIGH)	T+F: (N=21)	Rc'd	8	4	-9	19	-1	37	33	38	47[c]
		Gave	39[c]	-	-	42[c]	-	-	32	-	-
	T : (N=27)	Rc'd	63[a]	18	-7	73[a]	6	12	71[a]	18	10
		Gave	44[c]	-	-	73[a]	-	-	75[a]	-	-
	N : (N=24)	Rc'd	NOT ADMINISTERED						62[a]	12	39[c]
		Gave							69[a]	-	-

†All decimals omitted.

[a] $p < .001$ by the 1-tailed test.

[b] $p < .01$ by the 1-tailed test.

[c] $p < .05$ by the 1-tailed test.

*Because this mean was the same for each member of any given group, the r value had no meaning.

††T groups' N's = 26 for Time II only.

the most appropriate and relevant context, these z-scores were separately computed for each small group, instead of for composite groups. Consequently these correlations for raw and z-scores, that would have been identical for composite groups, differed sharply. The mean raw MEC estimates that individuals "received from" (partner-based) and "gave to" (self-based) all partners in the composite T+F groups at Times III versus IV correlated .33 and .32. Corresponding correlations of .71 "received" and .75 "given" (each $p < .001$) were observed for the composite T groups, and the composite Naive groups generated comparable correlations of .62 "received" and .69 "given" (each $p < .001$). Late (III vs. IV) interoccasion correlations within the T+F and T composite groups averaged somewhat larger ($r = .41$) than earlier (mean r for I vs. II = .33). For raw estimates, all interoccasion correlations were positive and most (20 of 26) were statistically significant, so the results generally supported the hypothesized positive linkage. For partner-based ("received") data, raw MEC estimates generally had higher and/or more positive interoccasion correlations than did either percentage or z-scores. The proportion of significant positive linkages was greatest for the raw measures (9/13 or 69%) versus 46% (6/13) for standardized and 23% (3/13) for percentage scores. Thus, the interoccasion stability of mean MEC estimates was somewhat higher for raw than for transformed data and it was about equal for partners (mean $r = .50$) and self-based (mean $r = .52$) estimates for raw measures.

Another prediction was that the interoccasion correlations of mean MEC estimates that individuals "received" at upper familiarity levels (occasions III vs. IV) would be highest in T+F groups, moderate in T and weakest, in Naive groups. Among the composite groups, Table 7 also shows that these correlations of mean raw MEC "received"

at Times III versus IV were .33 for T+F, .71 ($p < .001$) for T, and .62 ($p < .001$) for Naive groups. The corresponding correlations yielded by the percentage and z-score measures were .38, .18, and .12; and .47 ($p < .05$), .10, and .39 ($p < .05$), respectively. Although few differences between the comparable correlations of these paired training groups were statistically significant, the composite T+F groups' correlations exceeded those of the T and Naive groups by two of these three measures. These findings did not consistently support the hypothesized differential effect of various treatments (T+F, T, & Naive) on these correlations.

It had also been hypothesized that the T+F groups would generate more significant correlations between mean MEC estimates that individuals either gave to and/or received from partners on the four occasions (I, II, III, & IV) than would either training alone (T) or no training (Naive). Table 7 shows that half (6 of 12) of raw mean MEC estimates' interoccasion correlations were statistically significant (5 p's $< .05$ & 1 $p < .001$) for the composite T+F groups. For the composite T groups, however, all (12) similar correlations of mean raw MEC estimates were statistically significant (9 p's $< .001$, 2 p's $< .01$, & 1 $p < .05$). The comparable correlations of percentage and z-scores were generally weaker. Additionally, among z-score and percentage data five of 26 (19%) interoccasion correlations were negative versus only one (4%) of 24 similar raw score correlations. Mean raw MEC estimates generally yielded more reliable and meaningful information relevant to the current hypothesis than did percentage and z-scores, so raw seconds are featured in subsequent data analyses. However, the postulation that significantly more interoccasion linkages would occur in T+F groups than in T groups was contrary to

the data trends.

Another hypothesis was that the linkages of dyadic partners' (interpartners') MEC estimates would be positive and stronger later (III & IV) than earlier (I & II). Table 8 shows that the correlations of partners' MEC estimates (raw, percentage, & standardized) were positive at Times III and IV for all composite groups. While interpartner MEC correlations were weaker at Time III than at Time IV for both T and Naive groups, for the T+F groups this was mildly reversed. Thus, the findings broadly supported the postulated positive relationship between increasing familiarity and heightened interpartner MEC agreement. Finer grained analyses of data for individual groups, also depicted in Table 8, shows that the reverse was largely attributable to the marked intermeasure fluctuations of individual groups.

At moderate (III) and high (IV) familiarity it had been predicted that partners' MEC correlations would be high, medium, and low for T+F, T, and Naive groups, respectively. Table 8 also shows that partners' Time III MEC estimates consistently correlated strongest for T+F, average for T, and lowest for Naive groups by each measure. The comparable Time IV findings were more mixed, although the T+F groups' correlations exceeded the others in two of three instances. The postulated differential effect of treatments upon interpartner MEC agreement at upper familiarity levels was largely supported. Unrelated to any hypothesis, it was also observed that the average interpartner correlation reported in Table 8 was somewhat higher for transformed measures (.38 for %; .34 for $\underline{z}$-scores) than for raw seconds (.22).

Table 8. Interpartner MEC Correlations of Composite and Individual Treatment Groups by Three Measures[†]

			I: LOW			II: MODEST			III: MODERATE			IV: HIGH		
		N[††]	Raw	%	z	Raw	%	z	Raw	%	z	Raw	%	z
T+F:	#1	36	-5	32	-8	12	43[c]	43[c]	61[b]	39[c]	73[a]	38[a]	38	68[a]
	#2	36	1	33	52[b]	64[a]	9	59[b]	61[b]	49[c]	71[a]	69[c]	37	39[c]
	#3	36	-10	41[c]	26	58[b]	61[a]	76[a]	68[a]	54[b]	60[b]	9	63[a]	77[a]
	Composite	*108*	*0*	*34*[c]	*14*	*30*[b]	*27*[c]	*60*[a]	*59*[a]	*46*[a]	*68*[a]	*38*[a]	*41*[a]	*61*[a]
T:	#1	36	18	51[b]	32	9	24	62[b]	44[c]	39[c]	56[b]	87[a]	75[a]	81[a]
	#2	64	16	10	-9	17	31[c]	26	5	35[c]	26	28[c]	55[a]	9
	#3	25	2	28	29	-13	1	-7	17	34	-12	23	32	-4
	#4	16	39	-10	40	-34	61[c]	40	42	64[c]	-17	-55[c]	26	-49
	Composite	*141*	*26*[b]	*39*	*18*	*-7*	*27*[b]	*31*[b]	*12*	*45*[a]	*23*	*14*	*63*[a]	*21*[c]
N:	#1	36							15	-3	31	29	53	82[a]
	#2	36							-18	56[b]	0	-5	28	-63[b]
	#3	25							17	51[c]	66[b]	43	62	91[a]
	#4	16							-4	49	-12	60[c]	13	78[b]
	Composite	*113*							*11*	*15*	*23*[c]	*25*[b]	*43*[a]	*48*[a]

[†]All decimals omitted.

[††]N represents the number of paired partners per group, not the number of persons.

[a]p < .001 by the single-tailed test of significance.

[b]p < .01 by the single-tailed test of significance.

[c]p < .05 by the single-tailed test of significance.

Personality Measures

Table 9 lists acronyms for the personality measures selected for likely linkages with EMECS and Table 10 shows their intercorrelations. Thus, late peer-based ratings of individuals on ARO correlated .59 ($p < .001$) with similar ratings several weeks earlier, while postgroup peer-rated IBI Affection correlated .61 ($p < .001$) with peers' late ARO ratings and .42 ($p < .01$) with early self-rated ARO. Table 10 also shows how these personality measures interlinked to form elementary factors or typal structures (McQuitty, 1961). For instance, while ARO-PL, IBI Affection-P, ARO-PE, ARO-SL, ARO-SE, and IBI Affection-S constituted the primary factor, defined by measures that intercorrelated more strongly with another member of that type than they correlated with any nontypal member, ARS-PE, ARS-PL, ARS-SL, ARS-SE, and IBI Control-P constituted a second major type. A third factor, dominated by the self-rated FIRO instrument was composed of Inclusion-W (wanted from others), Affection-W, Inclusion-X (expressed toward others), Affection-X, and a weak trailer, Control-W. Also based exclusively on self-ratings was a minor fourth made up only of IBI Control-S and FIRO Control-X. Table 10 also presents factorial relevance estimates for each measure, consisting of its summed r^2's (Σr^2) with all other members of the same factor, as well as comparable cross-typal or interfactor relevancy estimates. Thus, the same-type relevancies of ARO-PL and IBI Affection-S were 1.37 and 0.99, respectively, and, among the six measures constituting the ARO factor, ARO-PL contributed the most and IBI Affection-S the least. For each factor, Table 10 also displays a total of summed r^2's ($\Sigma\Sigma r^2$'s). For instance, $\Sigma\Sigma r^2$ of the ARO and ARS major types were 7.3 and 6.00, respectively. Thus, the ARO factor contributed most to the total

Table 9. Personality Measure Acronyms.

Acceptance versus Rejection of Self (ARS)	
Peer ratings early	ARS-PE
Peer ratings late	ARS-PL
Self ratings early	ARS-SE
Self ratings late	ARS-SL
Acceptance versus Rejection of Others (ARO)	
Peer ratings early	ARO-PE
Peer ratings late	ARO-PL
Self ratings early	ARO-SE
Self ratings late	ARO-SL
Interpersonal Behavior Inventory (IBI)	
Control peer ratings	IBI Control-P
Control self ratings	IBI Control-S
Affection peer ratings	IBI Affection-P
Affection self ratings	IBI Affection-S
Fundamental Interpersonal Relations Orientation (FIRO)	
Control wanted	FIRO Control-W
Control expressed	FIRO Control-X
Affection wanted	FIRO Affection-W
Affection expressed	FIRO Affection-X
Inclusion wanted	FIRO Inclusion-W
Inclusion expressed	FIRO Inclusion-X

Table 10. Personality Measure Intercorrelations, Factorial Structures, and Factor Relevancies (Σr^2)†

	ARO FACTOR							ARS FACTOR						FIRO Factor						Control				% of Total Covariance	
	PL	P	PE	SL	SE	IBI S	Σr^2	PE	PL	SL	SE	IBI P	Σr^2	Affection W	Affection X	Inclusion W	Inclusion X	Cont. W	Σr^2	IBI S	FIRO E	Σr^2	$\Sigma\Sigma r^2$	Own Factor	Matrix
ARO-PL	.	61[a]	59[a]	65[a]	39[a]	27[c]	1.37	18	42[a]	37	11	-30[b]	0.45	0	13	-14	27[c]	-3	0.11	-27[c]	-21[c]	0.12	2.05	18.7	8.0
Afection, IBI-P	61[a]	.	61[a]	38[a]	42[a]	54[a]	1.36	31[b]	27[c]	24[c]	13	2	0.24	11	18	-3	32[b]	0	0.15	9	-11	0.02	1.77	18.6	6.9
ARO-PE	59[a]	61[a]	.	43[a]	46[a]	43[a]	1.30	24[b]	20[c]	23[c]	10	-14	0.18	-4	6	-7	23[c]	-2	0.06	-27[c]	-31[b]	0.17	1.71	17.8	6.7
ARO-SL	65[a]	38[a]	43[a]	.	53[a]	36[a]	1.16	-5	15	33[b]	-12	-27[b]	0.22	11	8	12	18	22	0.11	-30[b]	-20[c]	0.13	1.62	15.9	6.3
ARO-SE	39[a]	42[a]	46[a]	53[a]	.	56[a]	1.13	7	9	23	24[c]	1	0.12	11	25[c]	9	30[b]	6	0.18	-1	14	0.02	1.45	15.5	5.6
Affection, IBI-S	27[c]	54[a]	43[a]	36[a]	56[a]	.	0.99	18	6	27[b]	13	5	0.13	31	33[b]	17	15	23	0.31	22[c]	0	0.05	1.48	13.5	5.8
Total Covariance of Factor:							7.31						1.34						0.92			0.51	10.08		
ARS-PE	18	31[b]	24[b]	-5	7	18	0.23	.	74[a]	60[a]	65[a]	59[a]	1.68	23[c]	21[c]	7	8	-8	0.11	24[c]	11	0.07	2.09	28.0	8.1
ARS-PL	42[a]	27[c]	20[c]	15	9	6	0.32	74[a]	.	76[a]	47[a]	39[a]	1.50	31[b]	24[c]	9	23[c]	9	0.22	8	-3	0.01	2.05	25.0	8.0
ARS-SL	37	24[c]	23[c]	33[b]	23	27[b]	0.48	60[a]	76[a]	.	44[a]	26[c]	1.20	33[b]	27[c]	15	21[c]	7	0.25	13	0	0.02	1.95	20.0	7.6
ARS-SE	11	13	10	-12	24[c]	13	0.13	65[a]	47[a]	44[a]	.	33[b]	0.95	15	25[c]	3	17	-9	0.12	8	1	0.01	1.21	15.8	4.7
Control, IBI-P	-30	2	-14	-27[b]	1	5	0.19	59[a]	39[a]	26[c]	33[b]	.	0.68	33[b]	30[b]	22[c]	5	-12	0.26	44[a]	15	0.22	1.35	11.3	5.3
Total Covariance of Factor:							1.35						6.01						0.96			0.33	8.65		
FIRO Affection-W	0	11	-4	11	11	31	0.13	23[c]	31[b]	33[b]	15	33[b]	0.39	.	56[a]	63[a]	33[b]	19	0.86	25[c]	8	0.07	1.45	29.0	5.6
FIRO Affection-X	13	18	6	8	25[c]	33[b]	0.23	21[c]	24[c]	27[c]	25[c]	30[b]	0.33	56[a]	.	43[a]	51[a]	-1	0.76	24[c]	17	0.09	1.41	25.7	5.5
FIRO Inclusion-W	-14	-3	-7	12	9	17	0.08	7	9	15	3	22[c]	0.08	63[a]	43[a]	.	29[b]	30	0.76	25[c]	26[c]	0.13	1.05	25.7	4.1
FIRO Inclusion-X	27[c]	32[b]	23[c]	18	30[b]	15	0.37	8	23[c]	21[c]	17	5	0.13	33[b]	51[a]	29[b]	.	-4	0.45	22[c]	13	0.07	1.02	15.2	4.0
FIRO Control-W	-3	0	-2	22	6	23	0.11	-8	9	7	-9	-12	0.04	19	-1	30	-4	.	0.13	14	4	0.02	0.30	4.4	1.2
Total Covariance of Factor:							0.92						0.97						2.96			0.38	5.23		
Control, IBI-S	-27[c]	9	-27[c]	-30[b]	-1	22[c]	0.29	24[c]	8	13	8	44[a]	0.28	25[c]	24[c]	25[c]	22[c]	14	0.25	.	53[a]	0.28	1.10	50.0	4.3
Control FIRO-X	-21[c]	-11	-31[b]	-20[c]	-14	0	0.21	11	-3	0	1	15	0.04	8	17	26[c]	13	4	0.12	53[a]	.	0.28	0.65	50.0	2.5
Total Covariance of Factor:							0.50						0.32						0.37			0.56	1.75		
																							25.71		

†All decimals omitted for correlation coefficients.

[a] $p < .001$ using the two-tailed test.

[b] $p < .01$ using the two-tailed test.

[c] $p < .05$ using the two-tailed test.

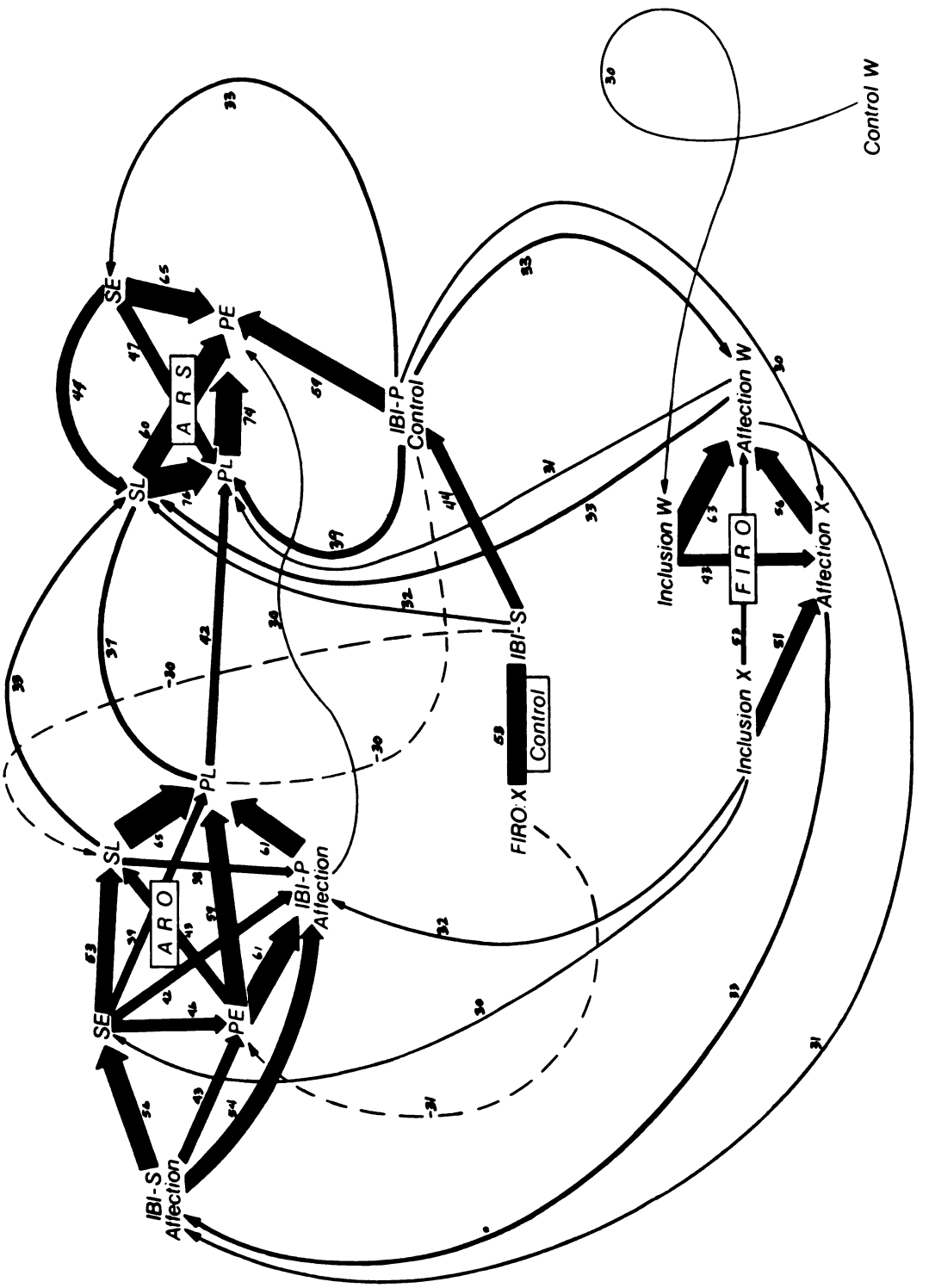

Figure 3. Diagrammed Intercorrelations of Personality Measures Depicting all r's of ± .30 or greater (N's = 73 - 61).

(grand) covariance of this battery of personality measures with ARS a close second. Figure 3 graphically depicts these types or elementary factors and their noteworthy interlinkages for all correlations of ± .30 and above. Arrowheads identify measures that contributed more to the total covariance of either the same factor or the total matrix. Broken lines identify the three negative linkages (ARO-SL to IBI Control-S, ARO-PE to FIRO Control-X, & ARO-PL to IBI Control-P). The width of these bonds is roughly proportional to the size of the relevant correlation. For example, the ARO-SL versus ARO-PL bond is the widest among the ARO cluster, representing a .65 correlation while the thinner ARO-SE versus ARO-PL bond depicts a .39 linkage.

Linkages of the EMECS to Personality Measures

It was hypothesized that individuals mean MEC (partner-based & self-based) would correlate positively with all personality measures. However, a preliminary survey of these data revealed so many negative correlations that it seemed more prudent to apply the more conservative two-tailed test of statistical significance to these data than to pre-emptorily dismiss the negative values as meaningless. Organized to feature those personality measures which linked most strongly to MEC for the seven groups (3 T+F & 4 T) that made MEC estimates on four occasions, despite the T groups' substantially greater MEC estimates on the three post-Time I occasions than were made by the T+F groups, Table 11 shows these correlations. Thus, partner-based Time II MEC estimates correlated .33 ($p < .05$) with ARS-PL. Most (92 of 144) single-occasion linkages of EMECS with the personality measures were positive and partner-based estimates yielded more (50) positive linkages than did self-based (42) estimates. Partner-based MEC estimates also

Table 11. Correlations of EMECS and Personality Measures for Combined Trained Groups.[†]

			Partner-based or "Received" MEC Estimates							Self-based or "Given" MEC Estimates						
			OCCASIONS				AGGREGATES			OCCASIONS				AGGREGATES		
			I	II	III	IV	I+II	III+IV	All	I	II	III	IV	I+II	III+IV	All
LATE	ARS	Peers	27	32[c]	25	33[c]	36[c]	31[c]	35[c]	-14	25	26	29[c]	-5	28	13
		Self	25	30[c]	30[c]	26	32[c]	30[c]	33[c]	-15	9	12	17	-9	13	2
	ARO	Peers	17	16	21	30[c]	20	31[c]	27	9	19	12	27	12	18	17
		Self	12	18	19	20	16	21	20	15	30[c]	14	26	21	17	21
FIRO Inclusion X (N = 47)			18	28	38[b]	40[b]	25	41[b]	35[c]	11	8	-7	-4	11	-8	2
EARLY	ARS	Peers	2	23	16	14	11	16	14	-10	-6	8	7	-11	8	-2
		Self	-2	14	14	10	4	12	9	2	-23	-6	-10	-5	-8	-3
	FIRO	Peers	-8	14	13	16	1	16	9	3	-2	-4	-8	2	-8	-2
		Self	4	9	18	5	6	12	8	8	-5	-2	4	3	0	2
FIRO Inclusion-W (N = 47)			-0	2	8	-7	1	-0	0	9	-3	0	-5	3	-5	1
Control	IBI	Peers	-8	-5	-8	-12	-8	-11	-10	-3	4	19	11	-1	15	8
		Self (N = 40)	-1	-3	4	-13	-3	-5	-4	21	-1	-29	-17	-21	-24	-25
	FIRO (N=47)	X	3	-3	16	-7	-0	4	2	-0	-19	-21	9	-14	15	-17
		W	-14	-9	-2	-8	-13	-15	-10	-1	5	6	1	-3	-3	-3
Affection	IBI	Peers	3	10	14	18	6	17	13	12	-3	-9	-4	8	-10	-1
		Self (N = 40)	-4	20	24	13	7	19	14	3	2	-9	-5	0	-4	-4
	FIRO (N=47)	X	-6	-3	-2	-11	-5	-7	-7	6	9	9	11	-3	8	6
		W	23	20	18	6	25	12	20	-2	20	23	13	4	14	10

[†]T+F and T groups N = 48, All decimals omitted.

[b] $p < .01$ by the two-tailed test.

[c] $p < .05$ by the two-tailed test.

accounted for 7 of 9 single-occasion correlations that reached statistical significance. Low familiarity (Time I) MEC contributed no significant bonds, while highest familiarity estimates (Time IV) yielded the most (4). Similarly, late ratings (ARS and ARO) of participants' within-group behavior yielded seven of the nine significant linkages versus none yielded by earlier ratings on these same measures.

For the presumably more reliable aggregated MEC indices, self-based MEC generated only 29 positive correlations (of 54) with personality measures and none was statistically significant. However, 41 of the comparable correlations of aggregated peer-based MEC estimates with personality measures were positive and nine of these reached statistical significance. Including these aggregated data, self-based estimates yielded a grand total of only two significant correlations versus 16 by partner-based estimates. Overall, Table 11 shows that EMECS linked significantly primarily to late ratings on ARS by peers (6) and self (5) and secondarily to self-rated FIRO Inclusion Expressed (4). The three remaining significant positive linkages all involved late ARO ratings by peers (2) and self (1). Thus, the prediction that the EMECS would generally correlate positively with these personality measures was supported, although this support was sparser and much more restricted than expected.

Beyond the hypotheses explored in this study, curiosity led to separately examining the correlations of MEC estimates with personality measures for segregated composite groups. The reader may recall that the composite Naive groups' Time IV MEC estimates averaged roughly four times those of the comparable T+F set; also that the latter's mean was less than half as large as the T groups' comparable

mean. Fully given in Appendices B (T+F), C (T), and D (Naive), these correlations are summarized for aggregated early and late partner-based ("received") and self-based ("given") MEC estimates in Table 12.

It seems reasonable that the clearest associations between MEC and the selected personality measures might occur among the T+F groups late (Times III and IV), following two prior feedback experiences and three training exercises, and that these linkages would be stronger for the aggregated late MEC estimates provided by pooled partners ("received") than for the more narrowly-based and probably less stable self-estimates ("given"). Aggregated late MEC data only partially fit these expectations, as a total of two (of 18 possible) significant positive correlations were generated by the T+F composite versus one by the T composite and none by the Naive composite. A roughly similar pattern held for the self-based ("given") MEC estimates, as two significant positive correlations were yielded by the T+F composite versus none by the T composite and two (plus 2 significant negative correlations) by the Naive composite. Also similar was the picture for their total positive correlations with combined self- and peer-based late aggregated (III & IV) MEC (T+F = 26 [of 36], T = 23, N = 23). The composite Naive groups' two significant negative correlations of aggregated late MEC and personality measures were especially surprising because both concerned <u>early</u> ARO ratings (self & peers). The unusual majority of negative correlations between ARO ratings aggregated late MEC (5 of 12 "received" and 9 of 12 "given"), and also with the ARO-linked IBI Affection measures (5 of 6 "given" and 2 of 6 "received"), suggests that this inverse MEC-ARO bond should be considered as a finding deserving further attention and not discounted as a mere "chance" deviation from the expected pattern of positive correlations.

Table 12. Correlations of 18 Personality Measures with Aggregated MEC Estimates for Segregated Groups[†]

	Partner-based (received) MEC Estimates					Self-based (given) MEC Estimates				
	Early (I+II)		Late (III+IV)			Early (I+II)		Late (III+IV)		
N =	T+F (21)	T (26)	T+F (21)	T (27)	N (24)	T+F (21)	T (26)	T+F (21)	T (27)	N (24)
ARS: PE	50[c]	-3	42	9	18	-6	-15	44[c]	-2	0
ARS: PL	53[b]	25	31	28	7	-20	2	26	27	29
ARS: SL	50[c]	29	9	43[c]	24	-25	0	5	16	8
ARS: SE	7	0	5	4	18	12	-17	22	-25	-3
IBI Control-P	2	-5	24	-10	17	-1	3	59[b]	19	0
ARO: PL	10	20	30	31	-11	5	12	-3	18	-33
IBI Affection-P	10	4	40	15	2	12	5	2	-20	-19
ARO: PE	0	-2	12	11	-4	-10	5	-24	-15	-43[c]
ARO: SL	-5	23	-1	26	-5	27	17	9	19	-7
ARO: SE	-12	14	-26	12	4	20	-11	-21	-7	-48[b]
IBI Affection-S	-27	18	-4	21	-13	12	-11	-29	-17	-13
FIRO Affection-W	44[c]	20	55[b]	12	15	-6	10	14	18	-2
FIRO Affection-X	13	-17	22	-18	20	45[c]	-23	18	7	10
FIRO Inclusion-W	-6	8	24	6	11	25	-4	38[c]	-6	24
FIRO Inclusion-X	21	19	46[c]	38[c]	5	36	-9	23	-31	18
FIRO Control-W	-15	-7	0	5	11	-8	7	-13	9	49[b]
Control, IBI-S	34	-5	28	-1	29	-24	-17	-8	-25	32
Control, FIRO-X	31	-9	27	5	13	19	30	32	-23	42[c]

[†] r = .01 x number.

[b] $p < .01$ by the two-tailed test of significance.

[c] p .05 by the two-tailed test of significance.

Table 13 broadly overviews all MEC-personality correlations, including the perspectives of combined (T+F + T) and segregated (T+F, T, & N) groups. It summarizes these data by sources (partner vs. self) and personality factors for aggregated MEC. Partner-based MEC yielded a total of 13 (among 126) significant positive correlations, while merely five positives (plus 2 negatives) were found with the comparable self-based MEC. The ARS personality factor yielded ten significant positive correlations (among 70) versus six (of 70) with the FIRO factors, one positive and two negative (among 84) with the ARO factor, and one positive (among 28) with Control. Late MEC yielded a grand total of 11 significant positive correlations and two negatives (among 144) versus seven positives (among 108) early.

Also revealing was a finer-grained analysis of how the IBI's 15 individual scales correlated with MEC (aggregated early & late: self-based & partner-based) for the composite T+F versus T groups. These IBI data included ratings of the individual by self and by pooled peers. Presented in Table 14, these correlations strongly reinforced the trend toward stronger associations of MEC and personality measures among T+F groups than among Training only groups. Thus, a total of 23 statistically significant MEC and personality correlations were yielded by T+F groups versus merely two by T groups. The majority (17 of 25) of these significant associations were with partner-based, rather than self-based, MEC. A remarkable feature of Table 14 was the series of five significant positive correlations of late self-based MEC with peers' ratings on <u>every</u> component (Dominance, Sociability, Exhibition, Competitiveness, & Hostility) of IBI's Control factor. These were the background of the substantial .59 ($\underline{p} < .01$) correlation of IBI's Control-P with aggregated late MEC

Table 13. Overview of all Significant, Total Positive, and Total Negative Correlations of Personality Factors and Aggregated Early (I+II) and Late (III+IV) MEC for Segregated (Table 12) and Combined (Table 11) Treatment Groups

Factor / MEC Source	Segregated (T+F, T, & N) Groups		Combined (T+F + T) Groups		Summary		All
	Early†	Late	Early	Late	Early†	Late	
	Sig; Σ+ Σ-	Sig; Σ+ Σ-	Sig; Σ+ Σ-	Sig; Σ+ Σ-	Sig; Σ+ Σ-	Sig; Σ+ Σ-	Sig; Σ+ Σ-
ARO							
a. Partner-based	0; 7 5	0; 11 7	0; 6 0	1; 6 0	0; 13 5	1; 17 7	+1,-2; 52 32
b. Self-based	0; 9 3	-2; 4 14	0; 6 0	0; 3 3	0; 15 3	-2; 7 17	
ARS							
a. Partner-based	3; 7 3	1; 14 1	2; 4 1	2; 4 1	5; 11 4	3; 18 2	10; 47 23
b. Self-based	0; 3 7	2; 11 4	0; 0 5	0; 4 1	0; 3 12	2; 15 5	
FIRO							
a. Partner-based	1; 6 4	2; 13 2	0; 3 2	1; 2 3	1; 9 6	3; 15 5	6; 45 25
b. Self-based	1; 5 5	1; 11 4	0; 3 2	0; 2 3	1; 8 7	1; 13 7	
CONTROL							
a. Partner-based	0; 2 2	0; 5 1	0; 0 2	0; 1 1	0; 2 4	0; 6 2	1; 14 14
b. Self-based	0; 2 2	1; 3 3	0; 0 2	0; 1 1	0; 2 4	1; 4 4	
ALL							
a. Partner-based	4; 22 14	3; 43 11	2; 13 5	4; 13 5	6; 35 19	7; 56 16	
b. Self-based	1; 19 17	+4,-2; 29 25	0; 9 9	0; 10 8	1; 28 26	4,-2; 39 33	
Grand Total:	5; 41 31	+7,-2; 72 36	2; 22 14	4; 23 13	7; 63 45	11,-2; 95 49	18,-2; 158 94

†MEC was not assessed early in N groups.

Table 14. Correlations of Aggregated Mean Early (I+II) and Late (III+IV) MEC Estimates with Ratings by Self (S) and Peers (P) on Individual IBI Scales for Segregated Groups

IBI FACTORS	Partner-based MEC								Self-based MEC								Total of Significant r's
	T				T+F				T				T+F				
	Early		Late		Early		Late		Early		Late		Early		Late		
N's:	S 21	P 26	S 22	P 27	S 18	P 21	S 18	P 21	S 21	P 26	S 22	P 27	S 18	P 21	S 18	P 21	
AFFECTION																	
Affiliativeness	-17	13	1	19	43[c]	6	7	40[c]	15	0	1	-5	-33	25	3	13	2
Nurturance	-22	-15	-26	5	0	24	-18	36	-6	-4	-14	-26	-22	11	-2	4	0
Agreeableness	-5	14	-12	26	15	-1	-28	30	34	-2	25	-17	-40	-7	-17	-11	0
Deference	14	6	-12	2	-13	-21	-52[c]	16	17	13	38[c]	-28	10	7	1	-10	2
CONTROL																	
Dominance	-6	3	-21	13	-27	20	4	31	-9	-8	-7	11	24	-13	21	47[c]	1
Sociability	4	1	-23	-4	48[c]	9	29	44[c]	15	7	16	4	21	27	41[c]	49[c]	4
Exhibition	-29	-10	-16	-12	-9	5	5	16	-11	11	-8	21	39	22	24	51[c]	1
Competitiveness	-28	-10	-33	-17	-45[c]	2	-39	3	-8	5	1	16	9	-19	-4	43[c]	2
Hostility	-25	-8	-13	-19	-47[c]	-19	-21	-2	-28	-6	-16	23	21	-19	6	38[c]	2
NONALIGNED																	
Submissiveness	-11	-4	-9	-16	-18	-43	-37	-37	-7	30	-5	-6	-23	-13	-30	-32	0
Abrasiveness	-23	-34[c]	-31	-32	-34	-31	-55[b]	8	-29	27	-29	-8	12	0	-13	-12	2
Inhibition	-12	-23	-23	-30	-31	-52[b]	-42[c]	-37[c]	-28	5	-25	-14	-28	-19	-32	-33	3-
Detachment	-21	-9	-27	-18	-42[c]	-11	-35	-24	-23	3	-14	3	-34	-26	-43[c]	-25	2
Succorance	-7	-4	-17	-14	-41[c]	-54	-69[a]	-23	8	32	14	19	2	-1	-29	-2	3-
Mistrust	-18	6	-10	-18	-65[b]	-22	-23	-22	-16	-14	-13	8	4	-17	-31	3	1
Number of statistically significant r's	0	1	0	0	7	2	4	3	0	0	1	0	0	0	2	5	
Subtotals:	1				16				1				7				25

[a] p < .001 by the two-tailed test.

[b] p < .01 by the two-tailed test.

[c] p < .05 by the two-tailed test.

in Table 11. Another noteworthy aspect of Table 14 was the T+F groups' four (2 for partner-based MEC, 1 for self-based MEC) late significant positive correlations with IBI Sociability. These contrasted with exclusively negative series of three significant correlations of both IBI Inhibition and Succorance with MEC among the T+F groups.

DISCUSSION

Overview

Feedback and training each reduced MEC estimates by more than half the estimates of untrained groups. Unfamiliarity apparently elicited exaggerated initial MEC estimates and growing familiarity was associated with higher interestimate consistency and increasing interpartner agreement. MEC estimates also linked interestingly to personality measures although these relationships seemed moderated by: (a) treatments (clearest for T+F groups' more restrained and considered MEC estimates, visible but weaker in T groups, and more puzzling in Naive groups); (b) sources (stronger when partner-based than when self-based); and (c) measures (clearer if MEC was aggregated than if assessed on single occasions). The significant MEC-personality linkages were sparser than expected and contained several surprises. Except that the interoccasion correlations of T+F group members' mean MEC estimates failed to reliably exceed those of other treatments, all hypotheses were supported.

Central Findings: Feedback, Training, and Familiarity

Feedback was presently defined in performance terms as the difference between the MEC estimates of the T+F groups minus that of the T groups, all of which received the same training exercises. It clearly had a major dampening effect upon MEC estimates. Thus, after receiving feedback about their Time I estimates, the composite T+F

groups' MEC estimates dropped nearly two-thirds at Time II and largely retained this decline at Times II and IV. These reductions seem at least partially attributable to fear of adverse reactions from others, compounded, perhaps, by the task or instrument familiarity effect reflected in the general decline of second MEC estimates in both T and N groups. Commenting upon Time II MEC estimates, one group (T+F) facilitator noted, "people admitted that this batch of estimates was largely influenced by the feedback from Time I estimates. The group also seemed proud that there were so many triangulated (small or zero) discrepancies and so few encircled (large) discrepancies this time" (See Figure 1). In the composite group (T+F) that received feedback the end result of these factors was that MEC estimates remained especially low from modest through high task-interpartner familiarity levels. Another problem of feedback is that some participants seemed particularly apprehensive about discrepancies of MEC estimates they "gave" to others versus estimates they "received" from others. They may have consequently lowered their own estimates, mainly to reduce cognitive dissonance, rather than because they actually believed that they had less MEC with partners.

On the other hand, this work has identified several advantages of feedback on MEC estimation. Feedback apparently produced (a) greater stability in MEC estimates, as each of three T+F groups showed greater stability in MEC estimations from Times II through IV than did any of the four T groups, and (b) higher intergroup consistency in mean MEC over time. The weaker late interoccasion stability correlations noted in T+F groups than found for T and N groups (See Table 6) were puzzling and may be due to too much smaller standard deviations of mean MEC estimates given at Times III and IV in the composite T+F groups (1.85

& 2.81, respectively) than in the comparable T groups (III = 10.53, IV = 12.98) and N groups (III = 27.65, IV = 21.01). Partners' MEC agreement was also highest for Training and Feedback, moderate for Training only, and slightly lower (at Times III & IV) for no training at all. Another notable benefit of T+F training is that it yielded the largest incidence of MEC's anticipated significant positive linkages with aggregated personality measures (See Table 11) for both partner-based estimates (T+F = 6, T = 1, N = 0) and self-based estimates (T+F = 3, T = 0, N = 2). Evidently the combined positive effect of feedback and training improved the quality and meaningfulness of assessed MEC. Overall, the merits of feedback on MEC estimation outweighed their limitations for the present purposes. Contrary to hypothesis V (p. 25), the combined T+F groups yielded fewer statistically significant inter-occasion correlations of mean MEC estimates "given" and "received" than did either the comparable T or Naive groups.

Treatments likewise influenced MEC estimates. The substantial intertreatment differences after Time I appropriately reflected the greater MEC-reducing effect of training plus feedback vis-a-vis either training alone or no training at all. Although their estimates differed substantially, each composite treatment groups' raw mean MEC estimates tended to stabilize with increasing familiarity. At Time III the treatments significantly and consistently effected inter-partner MEC correlations by all three measures (raw, standardized, & percentage). These correlations were always highest for the composite T+F group, medium for the T group, and lowest for the composite Naive group. The corresponding Time IV results were less clear, although again the T+F groups' correlations generally exceeded others. Because few of the differences between the comparable correlations of these

treatment groups reached statistical significance, this evidence was not rigorous. However, the trend of those "soft" distinctions plainly supported the hypothesized differential influence of the treatment at the higher familiarity levels.

Familiarity with the MEC estimation task and/or instrument appreciably reduced these estimates, as all composite groups' second MEC estimates were substantially under their initial estimates. However, this task-instrument effect appears overshadowed and eventually dominated by the influences of feedback, training, and interpartner familiarity. At both upper (III & IV) familiarity levels all interpartner MEC correlations were positive and were generally stronger at Time IV than at Time III. The only exception occurred for the combined T+F groups where the very restricted range of individuals' estimates may have adversely limited interpartner agreement. Overall, however, a positive linkage between increasing familiarity and strengthened interpartner MEC agreement was found. Degree of task-interpartner familiarity also significantly influenced MEC estimates ("given to others") as anticipated from Hadebe's (1983) work. From low to moderate familiarity, individuals' relatively high MEC estimates in both composite treatment groups (T+F & T) dropped sharply then generally stabilized with increasing task and interpartner familiarity except for a mild upturn at maximum familiarity.

Individuals' mean interoccasion MEC estimates correlated positively at moderate and high levels of familiarity (task-interpartner) for estimates given and received and all of these correlations were significant for raw MEC estimates. The prediction that increased familiarity with task and partners would yield positively correlated late interoccasion MEC estimates was strongly supported. The desirability of

training (and feedback) on MEC estimations was indicated by Hadebe's (1983) earlier findings that groups which received some improvised and unplanned training in MEC estimations made somewhat more stable and meaningful estimates than did untrained groups.

Despite the fact that differentially treated (T+F vs. T) groups with grossly different MEC norms were combined into a loose aggregate likely to reduce the prospect of statistically significant MEC-personality correlations, most of these linkages (depicted in Table 10) were positive at Times I through IV, as anticipated. These correlations also broadly resembled those yielded by the aggregated MEC data for segregated treatment groups given in Table 11. The foregoing observations revealed some notable connections between raw MEC estimates and personality measures. Partners' mean estimates of their MEC with individuals' accounted for most of these positive personality linkages (16 of 18 in Table 10 and 7 of 12 in Table 11). A grand total of 32 of these 432 correlations with the single occasion and aggregated raw MEC estimates were statistically significant. These results suggest that peer-based mean MEC estimates tend to be more meaningful, and perhaps, more valid, than their self-based counterparts. Self-based MEC estimates yielded a less than chance number (9/216) of significant correlations with the personality measures.

MEC Measures

This subjective approach to MEC assessment was sensitive to diverse influences. Despite some noteworthy variations among subgroups that received T and N treatments, MEC estimates generally varied with the type of treatment and also with individual's personality differences. Thus, the mean initial MEC estimates of nine-member group T #2 averaged

about one-third (13.7 vs. 35.2 seconds) those of group T #4's five members. All trained groups' Time I estimates averaged less than half (15.6 vs. 32.4 seconds) the composite Naive group's initial (Time III) mean MEC estimates. MEC estimates sometimes varied according to individual's emotional involvement with partners. Thus, a woman who acknowledged feeling quite attracted to a male partner estimated that they had 1200 seconds (20 minutes!) of MEC during a group session, although her partner estimated that they had merely only one second of MEC.

Raw MEC estimates proved superior to standardized and percentage scores for interoccasion stability, but not for interpartner agreement. Thus, standardized and percentage measures generated more positive and significant interpartner correlations than raw MEC estimates. These present advantages of raw MEC estimates, although contrary to Hadebe's (1983) findings for interoccasion linkages, possibly reflected the differential influence of treatments (T+F & T). The present work, therefore, emphasized raw MEC estimates in subsequent analyses and only considered standardized and/or percentage data in exploring interpartner agreement. Future studies of MEC should utilize each of these approaches in view of these somewhat conflicting findings in successive studies.

Personality Measures

Both early and late the self- and peer-based group ratings on ARO intercorrelated substantially and positively as expected. Self- and peer-based postgroup ratings on the IBI's Affection factor also bonded positively to this ARO cluster as anticipated, indicating that these six measures represented the primary dimension of interpersonal behavior

that Wiggins (1982) and other scholars have labelled affiliation. Surprisingly, however, neither Schutz's Affection nor Inclusion measures (either Expressed or Wanted from others) linked importantly to the primary affiliation measures, aside from four slim positive links (2 by Inclusion Expressed and one each by Affection Expressed and Wanted) to the ARO cluster. FIRO's two Affection measures showed four equally strong positive ties to ARS cluster members. That five of FIRO's six measures interlinked more strongly than they connected with any other personality measure suggests that they were heavily laden with variance peculiar to the FIRO's unique nature. Only FIRO Control Expressed bonded firmly to a non-FIRO measure, self-rated IBI Control.

Dominance, Wiggins' (1982) consensus label for the second principal dimension of interpersonal behavior, seemed well represented by the four (early and late, self- and peer-based) ARS measures and peer-rated IBI Control. In tandem, this five-measure factor and the six-measure ARO cluster accounted for nearly three-quarters of the total covariance (See Table 9) among the 18 personality measures, although the ARO and ARS factors' interconnections were generally modest (strongest were the same-time correlations of late peer-rated ARO with late ARS: peer-rated = .42; self-rated = .37). One of the five linkages between these ARS and ARO clusters (See Figure 3) was negative (ARO-PL vs. IBI Control-P). The minor Control (FIRO-X vs. IBI-Self) cluster had only four notable linkages to other measures, two positive bonds to members of ARS (SL & IBI Control-P) and two negative bonds to members of ARO (PE & SL). Thus, these self-based Control ratings highlighted differences between the ARO and ARS clusters.

In summary, these data largely confirmed the independent presence of the expected affiliation (ARO) and dominance (ARS) factors while raising questions about the validity and meaning of the FIRO-derived measures. Plainly the FIRO Affection measures did not relate to IBI Affection as proposed by Lorr and McNair (1965). FIRO Inclusion Wanted had no meaningful linkages to any member of the two principal dimensions of interpersonal behavior. In view of the FIRO cluster's general isolation from other reasonable members of the affiliation and dominance dimensions, these data raise doubts about the appropriateness of Schutz's (1958) label of FIRO (Fundamental Interpersonal Relations Orientation) for this set of measures.

EMECS Linkages with Personality Measures

More than half (17 of 30) of the significant positive correlations of personality measures involved members of the ARS quintet. Showing broad agreement that persons who are more active, expressive, and self-accepting tend to attract and give more MEC than do more passive, inexpressive, and self-rejecting individuals, nine (8 ARS + 1 IBI) of these 17 instances concerned peer-based personality ratings and eight concerned ARS self-ratings. This finding plainly agrees with Hurley and Bennett's (1983) finding that ARS's subscales generated many more significant positive correlations (42 vs. 19) with MEC estimates than did ARO's subscales.

The FIRO cluster contributed a total of nine significant linkages (among 120 possibilities) with MEC, five by Inclusion expressed, two by Affection wanted and solo contributions by Control wanted and Affection expressed. All of Inclusion expressed's bonds were to peer-based MEC, indicating that this self-based Inclusion rating was

a positive clue to subsequent efforts to maintain MEC. Affection wanted also linked consistently with partner-based MEC, but only in T+F groups. The inconsistent remaining single ties of self-based FIRO ratings were wholly to self-estimated MEC for segregated treatment groups.

The ARO cluster members' MEC correlations were puzzling, as only five among these 144 correlations (Tables 10 & 11) were significant. Three were positive (2 for ARO-PL with partner-based late MEC and one for ARO-SL with self-based early MEC) and two were negative (self-based late MEC with early ARO by peers and self in the Naive group). It is tempting to dismiss these as "chance" events, but this inclination is clouded by the unusual predominance of unexpected negative correlations (17 among 30) of self-based MEC with ARO cluster members among the segregated groups (Table 11), including both significant negative correlations. Apparently undisciplined (Naive) groups self-estimated MEC tended to vary inversely with their early self-ratings on ARO. Later partner-estimated MEC showed a contrary inclination, tending to correlate positively with late peer-rated ARO. These more ambiguous ARO-MEC linkages are also congruent with the mixed pattern of 19 positive but eight negative correlations of ARO subscales with MEC noted by Hurley and Bennett (1983).

Only one significant correlation occurred among 48 possible between MEC and the partners of the self-based Control doublet, suggesting that these personality measures were irrelevant to MEC.

The ARS and ARO ratings of participants' within-group behaviors generally contributed importantly to the MEC-personality linkages. The four (early & late, self-based & peer-based) ARS measures yielded most (16 of 30) of MEC's positive and significant personality associations, while the ARO measures contributed three positive and the only two

significant negative linkages with MEC. Additionally, ARS and ARO showed reasonable early-to-late stability and each largely linked to the IBI's personality factors as expected.

Outcome Highlights

The present study found that (a) even modest structured feedback and training in MEC estimation by fairly rudimentary procedures can yield estimates that are more meaningful and stable over time than untutored estimates; (b) peer-based ("received") MEC estimates appeared more meaningful than self-based ("given") estimates, possibly because the former reflected the pooled judgements of a set of well-informed others; and (c) more significant and reasonable correlations between MEC estimates and personality measures were generated by groups that received training and feedback than by groups given other treatments. The great majority of prior eye contact studies have been conducted in laboratories under experimental conditions. The current work demonstrated that MEC estimation can be reasonably assessed subjectively in noncontrived groups outside of the laboratory with brief programs of training and feedback. This facilitates further explorations of MEC in natural settings without the distorting influences of confounding artificial conditions (confederates, observers, skullcaps, machinery, and other equipment).

An unusual strength of the present work was that MEC estimates correlated positively and reliably with personality measures administered several weeks apart. The durability of these MEC-personality bonds cannot reasonably be attributed to the methodological artifacts that might well account for similar linkages observed when such measures are administered at the same time or within a narrow temporal perspective.

Suggestions for Further Related Studies

This work also has procedural implications. The current study employed MEC estimation training centered upon estimating a three-second interval by silently counting "One Mississippi, Two Mississippi, Three Mississippi" at normal speed. It also included relatively unstructured feedback sessions, rarely longer than ten minutes, during which participants voluntarily discussed discrepancies between their own and partner's MEC estimates. This rudimentary training and feedback appeared to substantially improve the interoccasion stability and intergroup consistency of MEC estimates, so it is recommended that future related studies should include more thorough training and feedback exercises. This may be achieved in several ways: (a) the effects of several different (3, 6, or 9 second) mutual gaze exercises on MEC estimates can be explored; (b) more detailed instructions can be developed for the training and/or feedback tasks; (c) more time (20 minutes or more, instead of 5 to 10) should be devoted to training or feedback. Such procedural advances may augment the meaningfulness of MEC estimates and enhance their reliability and validity (Horowitz, Inouye, & Siegelman, 1979). However, feedback may also have side effects that require attention. Thus, some participants are likely to become apprehensive after initially learning substantial discrepancies between their own MEC estimates vis-a-vis those from partners. Consequently, they may tend to unduely decrease subsequent MEC estimates.

From this current study, it was learned that high MEC estimates should be regarded with special caution because they may well be distorted by emotional involvements. In one extraordinary instance a woman who acknowledged feeling quite attracted to a male partner estimated that they had 1200 seconds of MEC during a group session,

versus her partner's estimated of only one second. Advanced training and/or feedback may decrease the likelihood of such aberrations in future studies of MEC.

Future researchers may also want to explore the impact of group size on MEC estimates. In the present work, group size differences suggested some problems. For example, five-member group T #4 consistently gave high estimates while low estimates were consistently produced by nine-member group T #2. Future studies might use groups of equal size or at least make systematic studies of the effects of group size on MEC estimates.

The very modest mean MEC estimates of only five to ten seconds with each of about six other small group members after many hours of relatively intimate personal discussions during 90-minutes (5400 seconds) meetings indicates the MEC is a relatively uncommon experience, occurring only about 1/100 of the time in highly favorable circumstances. Without training in MEC estimation, most persons apparently tend to grossly overestimate MEC. Even slight MEC estimation training seemed helpful, for the Time I mean estimates of the seven combined treatment T+F & T) groups were less than half that of the four combined Naive group's initial MEC estimates at Time III.

Contrary to Hadebe's (1983) findings, here raw MEC estimates proved superior to standardized and percentage scores for interoccasion stability. This advantage of raw MEC estimates possibly reflected unintentional usage of semi-treatments (like T+F & T) in Hadebe's prior work. On the other hand, the standardized and percentage measures generated more positive and significant interpartner correlations than did raw MEC estimates. The present work, therefore, emphasized raw

MEC estimates in subsequent analyses and only considered standardized and/or percentage data for exploring interpartner agreement. Future related studies should consider these differences between measures of MEC.

Averaged peer-based MEC estimates correlated more importantly with personality measures than did self-based ones. This agrees with the notion that the way an individual is seen by pooled others may yield more objective and reliable data than self-based reports. As Horowitz et al. (1979) have shown, pooling informed observers' impressions tends to increase the reliability and validity of psychological measures. Similar prospects were suggested by the aggregated MEC estimates which apparently yielded proportionally more positive significant correlations with personality measures for the T+F composite group than did single occasion MEC estimates. This observation suggests advantages of aggregated MEC estimates over single-occasion estimates in exploring relationships between MEC estimates and personality measures.

APPENDIX A

Appendix A

Estimates of Mutual Eye Contact in Seconds (EMECS)

IMPORTANT

Before you begin completing the Estimates of Mutual Eye Contact in Seconds (EMECS), we want you to know that its purpose is merely to gather some information about how you communicate with each other in this group. We are not trying to evaluate or judge the quality of your communication, but just to gain some additional information that may be useful to you and other group members in better understanding the communication events within this group.

Estimates of Mutual Eye Contact in Seconds (EMECS)

Instructions:

The left-hand column of this instrument shows the names of your group members.
1) Encircle your own name.
2) Estimate the amount of mutual eye contact that you believe you maintained with each person during this 90-minute session. This estimation MUST be in seconds.
3) Check the appropriate seconds in the row corresponding with each name.

(If you happen to make an error, neatly cancel it and check the appropriate cell.)

NOTE: Mutual eye contact (MEC) is defined as an event in which you believe that you have looked at each other's eyes while communicating verbally or non-verbally.

Seconds of Mutual Eye Contact: Number identifies center of category

Group Members	0	1	2	3	4	5	6	7	8	9	10	12	15	18	21	24	27	30	35	36	39	42	47	52	57	62	67	72	77	82	87	92	97	Give Specific # Above 100
Dean																																		
Ed																																		
Natalie																																		
Mayda																																		
Colleen																																		
LuAnn																																		
Dave																																		

Appendix B

Correlations of Personality Measures with Mean MEC Estimates for Composite T+F Groups†

		Partner-based (Received) MEC estimates							Self-based (Given) MEC Estimates						
		OCCASIONS				AGGREGATES			OCCASIONS				AGGREGATES		
	Times:	I	II	III	IV	I+II	III+IV	ALL	I	II	III	IV	I+II	III+IV	ALL
ARS	PE:	58[b]	7	44[c]	28	50[c]	42	56[b]	-10	16	35	36	-6	44[c]	4
ARS	PL:	63[a]	4	27	25	53[c]	31	56[b]	-25	16	30	15	-20	26	-12
ARS	SL:	55[b]	15	13	4	50[c]	9	47[c]	-26	-9	4	4	-25	5	-21
ARS	SE:	15	16	18	-7	7	5	8	14	-5	-12	37	12	22	16
IBI Control	P :	8	12	8	21	2	24	9	-7	28	48[c]	49[c]	-1	59[b]	12
ARO	PL:	20	-19	23	25	10	30	18	10	21	-16	7	5	-3	3
IBI Affection	P :	23	-25	41	26	10	40	21	18	-18	-9	9	12	2	11
ARO	PE:	12	-32	10	10	-0	12	3	-4	-36	-34	-10	-10	-24	-14
ARO	SL:	0	-16	-9	5	-5	-1	-4	31	-5	-3	15	27	9	26
ARO	SE:	-7	-20	-35	-10	-12	-26	-18	28	-30	-45[c]	1	20	-21	12
IBI Affection	S :	-21	-31	-19	9	-27	-4	-24	21	-34	-45	11	12	-29	4
FIRO Affection	W :	36	45[c]	26	60[b]	44[c]	55[b]	55[b]	-11	20	17	8	-6	14	-3
FIRO Affection	X :	15	3	12	22	13	22	18	44[c]	26	-15	34	45[c]	18	43
FIRO Inclusion	W :	-16	22	7	29	-6	24	1	21	32	27	34	25	38	30
FIRO Inclusion	X :	20	13	27	46[c]	21	46[c]	32	36	17	9	25	36	23	37
FIRO Control	W :	-15	-9	16	-13	-15	-0	13	-6	-15	-2	-16	-8	-13	-10
Control:	IBI-S :	23	47[c]	23	23	34	28	37	-22	-14	13	-19	-24	-8	-22
	FIRO-X :	24	34	36	12	31	27	35	21	2	17	32	19	32	24

†All N's = 21 except 18 for IBI self-rating.

All decimals omitted.

[a] $p < .001$ by the 2-tailed test of significance.

[b] $p < .01$ by the 2-tailed test of significance.

[c] $p < .05$ by the 2-tailed test of significance.

Appendix C

Correlations of Personality Measures with Mean MEC Estimates for Composite T Groups[†]

		Partner-based (Received) MEC Estimates							Self-based (Given) MEC Estimates						
		OCCASIONS				AGGREGATES			OCCASIONS				AGGREGATES		
	Times:	I	II	III	IV	I+II	III+IV	ALL	I	II	III	IV	I+II	III+IV	ALL
ARS	PE:	-25	27	10	7	-3	9	4	-11	-19	1	-2	-15	-2	-9
ARS	PL:	5	41[c]	19	32	25	28	29	-7	24	24	31	2	27	19
ARS	SL:	10	45[c]	42[c]	38	29	43[c]	39[c]	-6	16	15	22	-0	16	10
ARS	SE:	8	14	6	2	-0	4	3	-9	-43[c]	-16	-31	-17	-25	-23
IBI Control	P :	-12	3	-6	-12	-5	-10	-8	-1	6	23	13	3	19	12
ARO	PL:	16	20	17	40[c]	20	31	27	7	24	11	29	12	18	17
IBI Affection	P :	-7	16	10	17	4	15	10	8	-5	-16	-12	5	-20	-8
ARO	PE:	-17	17	8	12	-2	11	5	5	-4	-8	-16	5	-15	-6
ARO	SL:	17	26	24	25	23	26	26	4	41[c]	16	16	17	19	20
ARO	SE:	-10	12	25	-2	14	12	14	-12	-9	-5	-3	-11	-7	-10
IBI Affection	S :	3	34	31	7	18	21	20	-14	5	-16	-15	-11	-17	-15
FIRO Affection	W :	18	19	23	0	20	12	17	3	24	30	17	10	18	16
FIRO Affection	X :	-19	-10	-8	26	-17	-18	-18	-26	4	14	7	-23	7	-9
FIRO Inclusion	W :	8	7	18	6	8	6	7	2	-4	3	-6	-4	-6	-5
FIRO Inclusion	X :	16	20	36	34	19	38	30	-7	-8	-24	-25	-9	-31	-22
FIRO Control	W :	-13	2	10	3	-7	5	-1	6	26	0	16	7	9	9
Control IBI	S :	-8	-5	11	-12	-5	-1	-2	-21	8	-33	-15	-17	-25	-22
Control FIRO	X :	-6	-11	20	10	-9	5	-2	-13	-24	-29	-15	-30	-23	-29

[†]All MEC N's = 27 except 26 for II and its aggregates. Personality N's = 27 for all ARS, ARO, and IBI peer ratings. FIRO N's = 26; IBI self-rating N's = 22. All decimals omitted.

[c] $P < .05$ by the 2-tailed test of significance

Appendix D

Correlations of Personality Measures with Mean MEC Estimates for Composite N Groups[†]

		Partner-based(Received) MEC Estimates							Self-based (Given) MEC Estimates						
		OCCASIONS				AGGREGATES			OCCASIONS				AGGREGATES		
		I	II	III	IV	I+II	III+IV	ALL	I	II	III	IV	I+II	III+IV	ALL
ARS	PE:			9	28		18				-6	7		-0	
ARS	PL:			17	29		24				11	2		8	
ARS	SL:			-3	23		7				32	23		29	
ARS	SE:			4	31		18				-4	-4		-3	
IBI Control	P :			10	25		17				-8	11		0	
ARO	PL:			-21	6		-11				-28	-36		-33	
IBI Affection	P :			4	-8		2				-29	-8		-19	
ARO	PE:			-9	-4		-4				-47[b]	-38		-43[c]	
ARO	SL:			-3	-7		-5				1	-17		7	
ARO	SE:			5	-3		4				-48[b]	-44[c]		-48[b]	
IBI Affection	S :			5	-29		-13				-14	-3		-13	
FIRO Affection	W :			21	13		15				-8	13		-2	
FIRO Affection	X :			8	48[c]		20				-7	39		10	
FIRO Inclusion	W :			18	6		11				25	24		24	
FIRO Inclusion	X :			-17	30		5				8	26		18	
FIRO Control	W :			16	-2		11				46[c]	46[c]		49[b]	
Control IBI	S :			24	29		29				18	45[c]		32	
Control FIRO	X :			14	6		13				40[c]	39		43[c]	

[†] N's = 25 for III, 24 for IV. All decimals omitted.

[b] $p < .01$ by the 2-tail test of significance.

[c] $p < .05$ by the 2-tail test of significance.

APPENDIX B

APPENDIX C

APPENDIX D

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