

Development of the Nonverbal Immediacy Scale (NIS): Measures of Self- and Other-Perceived Nonverbal Immediacy

Virginia P. Richmond, James C. McCroskey, and Aaron D. Johnson

In recent years nonverbal immediacy has received considerable attention from researchers concerned with instructional communication, interpersonal communication, and organizational communication. Unfortunately, the instruments used to measure nonverbal immediacy in these contexts sometimes have been problematic in terms of their reliability estimates. This research attempted to overcome this problem, or failing that, to identify the cause(s) of the reduced reliability. The research resulted in a scale with high reliability when used as either a self-report or an other-report measure. It was also found to be equally reliable across the contexts of instructional, interpersonal, and organizational communication. Content validity of the scale is good and an initial test of predictive validity produced a high validity correlation. Unexpected sex differences were observed in the results and these are discussed in this report.

KEY CONCEPTS nonverbal immediacy, measurement, self-perceived immediacy, other-perceived immediacy

Virginia P. Richmond (Ph.D., University of Nebraska, 1977) and James C. McCroskey (Ed.D., Pennsylvania State University, 1966) are Professors of Communication Studies at West Virginia University, Morgantown, WV 26506-6293. Aaron D. Johnson (M.A., West Virginia University, 2001) is a doctoral student at the same institution.

Immediacy, particularly nonverbal immediacy, has received increasing attention from communication scholars over the last quarter-century. In general, this research has indicated that communicators who engage in nonverbally immediate behaviors with others are seen by those others in a more positive way than they see people who do not engage in those communication behaviors. Unfortunately, the reliability estimates for the instruments which have been used to measure nonverbal immediacy often have been found to be quite low. Hence, the validity of these instruments is also open to question. The purpose of the present research was to develop a reliable nonverbal immediacy measure which could be used as a self-report:

instrument or (with modified wording) as an other-report instrument.

THE IMMEDIACY CONSTRUCT

The contemporary view of immediacy has evolved from the work of Mehrabian (1966, 1971, 1981). Mehrabian's earliest work focused on verbal (linguistic) immediacy. His later work focused more on nonverbal immediacy. His early research led to his *immediacy principle*, which states "people are drawn toward persons and things they like, they evaluate highly, and prefer; they avoid or move away from things they dislike, evaluate negatively, or do not prefer" (Mehrabian, 1971, p.1). This view, then, suggests that "liking causes immediacy." This provides a good psychological explanation of why immediacy exists. Internal affect produces immediate behavior. However, this does not account for the possibility that individuals might engage in these immediate behaviors even if they do not have the internal affect.

Although most communication researchers have followed the pattern of the first immediacy researcher in this field (Andersen, 1978, 1979) and recognized the foundational work of Mehrabian, they have not followed his psychological approach. Rather they have focused on the impact of immediate communication on others. This "immediacy causes liking" approach is more typical of communication researchers who tend to focus their work on the outcomes of communication behavior rather than the psychological causes of that communication behavior (for a summary of this work in the instructional communication area see McCroskey & Richmond, 1992). This distinction in research approaches led Richmond and McCroskey (2000a) to posit a corollary to Mehrabian's original principle of immediacy. Their "principle of immediate communication" states that "the more communicators employ immediate behaviors, the more others will like, evaluate highly, and prefer such communicators; and the less communicators employ immediate behaviors the more others will dislike, evaluate negatively, and reject such communicators" (p. 212). This communication perspective views immediacy behaviors under the control of communicators to be tools with which to influence the responses of others.

These two principles suggest reciprocal causation. This view was taken directly by McCroskey and Richmond (2000b) in their research in the organizational context. They drew on both accommodation theory and reciprocity theory to advance their hypotheses. Their hypothesis that in the on-going context of organizational communication the immediacy of the supervisor and the subordinate would be correlated was supported in this research. In short, both principles which have been advanced appear to be correct and not contradictory.

Measurement of Verbal and Nonverbal Immediacy

In Mehrabian's early work (1966) he advanced the idea that linguistic features may exist which reveal an individual's affect toward another or others. This led Gorham (1988) to attempt to develop a measure of verbal immediacy. Rather than examining linguistic features of communication, however, she centered on the larger picture of what kinds of things people say—in this instance what teachers say to students. This measure was initially well-received by immediacy researchers. However, subsequently a careful analysis of the methods used to generate the measure indicated it was completely invalid as a measure of verbal immediacy. Instead it was determined to be a measure of the verbal behaviors exhibited by good teachers—not necessarily immediate behaviors (Robinson & Richmond, 1995).

Subsequently, Mottet and Richmond (1998) made another attempt to develop a verbal immediacy measure. They also were unsuccessful. However, they were able to generate topologies of both verbal approach and verbal avoidance techniques. Although these topologies are very useful in guiding people in ways to appear more or less approachable, Mottet and Richmond clearly indicate that immediacy and approach-avoidance are very different constructs. Hence, there currently is no measure of verbal immediacy and, given the breadth of Mottet and Richmond's efforts, it is likely that it is better to think of immediacy simply as a nonverbal construct. Although there is little doubt that there are things which people can say that will make them appear to be more likeable, the repertoire of these messages may be too small to deserve future attention by immediacy researchers. What is represented in these messages probably can be integrated with the work on approach-avoidance messages to more advantage than integrating them within the immediacy construct.

Communication research on immediacy and its measurement began in instructional communication with the work of Andersen (1978, 1979). Her concerns were with the measurement of the immediacy of teachers and its association with learning. In her research Andersen employed three different measurement approaches. The first was the Behavioral Indicators of Immediacy (BII) measure. This was a 15-item Likert-type scale which was completed by students with respect to the teacher of their class. The second measure was the Generalized Immediacy (GI) scale, a 9-item measure employing bipolar scales. This measure was based on McCroskey's Generalized Belief Scale (McCroskey & Richmond, 1996) which had not been published at that time. This scale also was completed by the students with regard to their teacher. The third measure was an 11-item rating scale. This scale was completed by trained observers who observed each teacher's class. The BII and the rating scale were considered low-inference measures, while the GI was a high inference scale.

The results of the Andersen (1978, 1979) study indicated that the BII was highly related to both the GI and the observer ratings. This suggested that students could report their teachers' immediacy as well as trained observers, thus indicating that trained observers were not needed in future immediacy research. Both the BII and the GI generated reliability estimates above .90. In the development of the BII, however, factor analyses indicated the 13 of 28 original items needed to be deleted since they did not load on the primary factor. Although this raised the reliability of the instrument, it substantially reduced its face validity. Hence, most researchers accepted the GI scale as the better instrument for future studies.

Unfortunately, a critical validity test of the GI scale indicated that may have been a poor choice. Data were collected from both teachers and their students with regard to the teachers' nonverbal immediacy. The GI scale was employed. The correlation between student and teacher was small and non-significant (Rodgers & McCroskey, 1984). It was suspected that the high-inference nature of the measure was the problem. This was confirmed by Gorham and Zakahi (1990) when they found a very substantial correlation ($r = .70$) between student and teacher reports of the teachers' immediacy employing a low-inference measure based on the Andersen's original BII scale.

As a result of Rodgers and McCroskey's findings, Richmond, Gorham, and McCroskey (1987) re-examined the original BII scale. That re-examination resulted in these researchers noticing that the instructions for the BII scale asked the students to compare their teacher with other teachers they had on each of the scale items. This indicated that the BII was not a low-inference scale as it earlier had been believed to be.

They generated a new scale to measure immediacy of teachers which instructed respondents to report on teachers' immediacy with no reference to other teachers they had experienced. This 14-item measure was the one employed by Gorham and Zakahi (1990) which generated very positive indications of validity. Some items on this scale were drawn from Andersen's work and others were generated by the researchers in hopes of having a better balance of positively and negatively worded items. This scale was labeled the Nonverbal Immediacy Measure (NIM). This measure in its original form or a revised, 10-item form (McCroskey, Richmond, Sallinen, Fayer, & Barraclough, 1995) has been the most common choice of instructional communication researchers since that time.

Reliability Problems

The evolution of measures of nonverbal immediacy was primarily within instructional communication research. In addition to the validity problems with these measures noted above, there also has been a problem with reliability. Both the 14- and 10-item NIM have provided a wide variety of reliability estimates—ranging from .67 to .89 (Hess & Smythe, 2001; McCroskey et al., 1995) with most of the estimates in the middle of this range. An instrument developed by Burgoon, Buller, Hale, & deTurck (1984) produced similar reliability estimates (.76). A self-report of immediacy developed by Richmond and McCroskey (2000a) has estimates a bit higher, .81 in three studies. However, the reliability for a version of this scale designed to be an other-report of immediacy (in this study, supervisors) generated a .87 reliability estimate.

Even though numerous studies have shown nonverbal immediacy measures to be substantially correlated with a variety of outcome variables, the reliability issue is still important. Although reliabilities above .80 are normally considered quite satisfactory, those below .70 generally are not. Simply put, there is room for improvement. Given the inconsistent reliability estimates for nonverbal immediacy measures, it is likely that the degree of association of nonverbal immediacy with these other variables has been underestimated. As a consequence, the current study was designed to produce more reliable instruments which can be used in communication research to measure either self-reported nonverbal immediacy or other-reported nonverbal immediacy. If we were to fail in this endeavor, we hoped that we would at least be able to determine the source(s) of unreliability affecting nonverbal immediacy measures.

METHOD

Participants

Participants were undergraduate students enrolled in mass-lecture introductory courses in communication at a large Mid-Atlantic university. The data were collected during the first week of classes to avoid the possibility that the participants' responses on the questionnaires would be influenced by content in the course. A total of 656 instruments were completed by males (53%) and 585 were completed by females (47%). Participation in this study was voluntary and students were awarded bonus points toward their final grade for their participation, which accounted for approximately 0.5 percent of their final grade. A small number (5) of the students did not fully complete the instruments. They did receive their participation points but their responses were not included in the data analyses (or included in the count above). The classes in which the participants were enrolled draw students from all colleges and departments in the university which enroll undergraduates. Although we did not collect direct reports

concerning race or ethnicity from the participants, based on the enrollment data for the courses, they were predominately Caucasian (>95%), with the remainder being highly diverse. This is consistent with the overall enrollment in the university. Because of the small number of non-Caucasians, this information was obtained from enrollment data rather than including it on the questionnaire to protect the anonymity of the participants.

Measures

Nonverbal Immediacy Instrument. Since the purpose of this research was to develop a measure which could be employed either as a self-report or as an other-report, some items for the instrument were drawn from previously used measures of both types. These items were drawn primarily from instruments developed or revised by Andersen (1978, 1979), McCroskey, Richmond, Sallinen, Fayer, and Barraclough (1995), Richmond, Gorham, and McCroskey (1987), and Richmond and McCroskey (2000). Some additional items were generated by the researchers to balance the positively worded items (where agreement would indicate high immediacy) with negatively worded items (where agreement would indicate low immediacy).

A total of 26 items (13 positively worded, 13 negatively worded) were chosen to constitute the research instrument. These items are presented in Figure 1 as a self-report of nonverbal immediacy and in Figure 2 as an other-report of nonverbal immediacy. The only differences between the two versions of the instrument are the designation of the target to be addressed (applies "to you" for self-report, applies to [a designated target] for other-report) and the wording of the items ("I use my hands . . ." for self-report, "He/She uses her/his hands . . ." for other-report).

The items were presented with a 5-point Likert-type response format (noted in Figures 1 and 2). Scores on the 13 negatively worded items were reflected prior to data analyses. These are items 3, 4, 5, 7, 8, 9, 11, 18, 20, 23, 24, 25, and 26.

Validation Instruments. Although additional validity tests for these instruments will come as a function of future research, two simple instruments were developed as a preliminary test of predictive validity. Since immediate communicators are often described as "warm" and "approachable," two-item instruments were developed for initial validity tests of the scales as predictors of warmth and approachability.

The items chosen for the measure of warmth were (in the form for other-perceived immediacy): He/She is a "warm" person when talking; and He/She is a "cold" person when talking. The items chosen to measure approachability were (in the form for the self-report of immediacy): I am approachable; and I am not approachable. The same type of response pattern as was used for the immediacy scale was employed for these measures. Again, the scoring of the negatively worded items was reflected prior to data analyses. Obtained alpha reliability for the warmth instrument was estimated at .65. For the approachability instrument the alpha estimate was .66. These were deemed less than fully satisfactory for an initial predictive validity test. Consequently, scores on these two instruments were added together to form a four-item measure of "warmth and approachability." This appeared justified by the substantial intercorrelations of the four items involved. The obtained alpha reliability for this combined instrument was .80. This was considered satisfactory for the initial predictive validity test.

Procedure

Instruments were prepared to be either a self-report measure or an other-report

FIGURE 1
Nonverbal Immediacy Scale-Self Report--NIS-S

DIRECTIONS: The following statements describe the ways some people behave while talking with or to others. Please indicate in the space at the left of each item the degree to which you believe the statement applies TO YOU. Please use the following 5-point scale:

1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Often; 5 = Very Often

- _____ 1. I use my hands and arms to gesture while talking to people.
- _____ 2. I touch others on the shoulder or arm while talking to them.
- _____ 3. I use a monotone or dull voice while talking to people.
- _____ 4. I look over or away from others while talking to them.
- _____ 5. I move away from others when they touch me while we are talking.
- _____ 6. I have a relaxed body position when I talk to people.
- _____ 7. I frown while talking to people.
- _____ 8. I avoid eye contact while talking to people.
- _____ 9. I have a tense body position while talking to people.
- _____ 10. I sit close or stand close to people while talking with them.
- _____ 11. My voice is monotonous or dull when I talk to people.
- _____ 12. I use a variety of vocal expressions when I talk to people.
- _____ 13. I gesture when I talk to people.
- _____ 14. I am animated when I talk to people.
- _____ 15. I have a bland facial expression when I talk to people.
- _____ 16. I move closer to people when I talk to them.
- _____ 17. I look directly at people while talking to them.
- _____ 18. I am stiff when I talk to people.
- _____ 19. I have a lot of vocal variety when I talk to people.
- _____ 20. I avoid gesturing while I am talking to people.
- _____ 21. I lean toward people when I talk to them.
- _____ 22. I maintain eye contact with people when I talk to them.
- _____ 23. I try not to sit or stand close to people when I talk with them.
- _____ 24. I lean away from people when I talk to them.
- _____ 25. I smile when I talk to people.
- _____ 26. I avoid touching people when I talk to them.

Scoring for NIS-S:

Step 1. Start with a score of 78. Add the scores from the following items:

- 1, 2, 6, 10, 12, 13, 14, 16, 17, 19, 21, 22, and 25.

Step 2. Add the scores from the following items:

- 3, 4, 5, 7, 8, 9, 11, 15, 18, 20, 23, 24, and 26.

Total Score = Step 1 minus Step 2.

measure. The target individual was varied across three types — teacher, supervisor, and date. These were chosen to represent the school environment, the work environment, and the social environment. These were believed to be a good cross-section of the communication contexts which the participants encounter. For the teacher condition, the participants were asked to respond to "the teacher you have in the class just before the one you are in." This is the most common method of assuring a broadly representative sample of teachers in instructional research. For the supervisor condition, the participants were asked to respond to "the supervisor you have in your current job, or had in your most recent job." Since the participants were all students and some were not employed while attending school, the latter portion of the instructions directed them to a recent job. For the date condition, the participants were asked to respond to the person "you most recently dated, but are *not* dating now." A previous dating partner was chosen over a current one because the researchers believed that responses to this target would be less skewed than might be the case if participants were responding to a current significant-other.

FIGURE 2
Nonverbal Immediacy Scale-Observer Report (NIS-O)

DIRECTIONS: The following statements describe the ways some people behave while talking with or to others. Please indicate in the space at the left of each item the degree to which you believe the statement applies to (fill in the target person's name or description). Please use the following 5-point scale:

1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Often; 5 = Very Often

- _____ 1. He/she uses her/his hands and arms to gesture while talking to people.
- _____ 2. He/she touches others on the shoulder or arm while talking to them.
- _____ 3. He/she uses a monotone or dull voice while talking to people.
- _____ 4. He/she looks over or away from others while talking to them.
- _____ 5. He/she moves away from others when they touch me while we are talking.
- _____ 6. He/she has a relaxed body position when he/she talks to people.
- _____ 7. He/she frowns while talking to people.
- _____ 8. He/she avoids eye contact while talking to people.
- _____ 9. He/she has a tense body position while talking to people.
- _____ 10. He/she sits close or stands close to people while talking with them.
- _____ 11. Her/his voice is monotonous or dull when he/she talks to people.
- _____ 12. He/she uses a variety of vocal expressions when he/she talks to people.
- _____ 13. He/she gestures when he/she talks to people.
- _____ 14. He/she is animated when he/she talk to people.
- _____ 15. He/she has a bland facial expression when he/she talks to people.
- _____ 16. He/she moves closer to people when he/she talks to them.
- _____ 17. He/she looks directly at people while talking to them.
- _____ 18. He/she is stiff when he/she talks to people.
- _____ 19. He/she has a lot of vocal variety when he/she talks to people.
- _____ 20. He/she avoids gesturing while he/she is talking to people.
- _____ 21. He/she leans toward people when he/she talks to them.
- _____ 22. He/she maintains eye contact with people when he/she talks to them.
- _____ 23. He/she tries not to sit or stand close to people when he/she talks with them.
- _____ 24. He/she leans away from people when he/she talks to them.
- _____ 25. He/she smiles when he/she talks to people.
- _____ 26. He/she avoids touching people when he/she talks to them.

Scoring for NIS-O:

Step 1. Start with a score of 78. Add the scores from the following items:

1, 2, 6, 10, 12, 13, 14, 16, 17, 19, 21, 22, and 25.

Step 2. Add the scores from the following items:

3, 4, 5, 7, 8, 9, 11, 15, 18, 20, 23, 24, and 26.

Total Score = Step 1 minus Step 2.

Instruments were distributed so that there would be as close as possible to an equal number of participants in each target condition and assure that there were at least 300 participants in each condition as recommended by Hatcher (1994). This resulted in 311 participants in the self-report condition, 310 in the teacher condition, 311 in the supervisor condition, and 309 in the date condition.

Data Analyses

All data analyses employed the appropriate SAS statistical software. The first set of analyses involved a series of principal components factor analyses. Both unrotated factor loadings and loadings for two factors employing oblique (Promax) rotation were examined. Since our intent was to generate a single-dimensional scale, the unrotated factor loadings provided the first test of dimensionality. These are reported in Table 1. The second test of dimensionality was the rotated factor loadings and the relationship between the two factors obtained.

Once a scale was identified, the means, standard deviations, and score-ranges for

TABLE 1
Unrotated First Factor Loadings for All Data Sets

Item	Self-Report	Teacher	Data Set Supervisor	Date	Overall
1	.62	.53	.57	.54	.56
2	.46	.14	.53	.52	.38
3	.49	.67	.73	.60	.64
4	.41	.54	.61	.56	.50
5	.44	.52	.51	.59	.48
6	.41	.57	.51	.54	.53
7	.49	.56	.56	.60	.53
8	.49	.62	.57	.65	.58
9	.49	.67	.65	.68	.64
10	.45	.47	.51	.64	.48
11	.48	.69	.69	.63	.64
12	.63	.73	.67	.62	.67
13	.64	.61	.57	.52	.58
14	.66	.66	.61	.62	.64
15	.54	.69	.73	.62	.67
16	.59	.48	.59	.67	.58
17	.56	.61	.58	.53	.56
18	.48	.72	.60	.65	.63
19	.60	.69	.68	.62	.66
20	.59	.58	.50	.51	.54
21	.53	.42	.50	.55	.49
22	.54	.60	.61	.62	.59
23	.46	.45	.56	.58	.50
24	.50	.57	.59	.58	.58
25	.56	.71	.70	.65	.67
26	.45	.20	.43	.51	.38

all measures were computed. These results are summarized in Table 2. In addition, possible sex effects were examined and tests of the significance of those effects was obtained through analyses of variance. The basic statistics by sex and the results of the tests for differences between males and females are reported in Table 3.

TABLE 2
Simple Statistics for Data Sets

Measure	Mean	Standard Deviation	Possible Range	Obtained Range
Overall Immediacy	94.9	14.9	26-130	40-130
Self	97.7	11.6	26-130	68-127
Teacher	93.8	15.2	26-130	40-130
Supervisor	93.4	16.3	26-130	45-130
Date	95.1	15.3	26-130	48-130
Overall Warmth/ Approachability	15.7	3.1	4-20	4-20
Self	16.7	2.2	4-20	7-20
Teacher	15.5	3.1	4-20	4-20
Supervisor	14.7	3.5	4-20	6-20
Date	15.9	2.9	4-20	7-20

TABLE 3
Means and Standard Deviations of Measures by Sex

Measure	Males		Females		F-ratio	p<	Variance
	Mean	S.D.	Mean	S.D.			
Nonverbal Immediacy							
Overall	92.2	14.1	98.0	15.1	49.3	.0001	.04
Self	93.8	10.8	102.0	10.9	44.2	.0001	.13
Teacher	91.1	14.4	96.7	15.7	10.5	.001	.03
Supervisor	90.1	15.3	96.9	16.8	13.9	.001	.04
Date	93.7	14.8	96.6	15.7	<2.0	NSD	---
Warmth/Approachability							
Overall	15.3	3.1	16.2	3.0	29.6	.0001	.02
Self	16.1	2.4	17.4	1.8	27.7	.0001	.08
Teacher	14.9	3.1	16.1	3.1	11.6	.001	.04
Supervisor	14.1	3.4	15.3	3.5	8.2	.01	.03
Date	15.7	2.9	16.0	2.9	<2.0	NSD	---

The third set of analyses focused on alpha reliabilities of the instrument in each of the conditions studied and the overall data set. In conjunction with these analyses, the SAS software employed automatically provided information that we could use to determine whether eliminating any item from the measure would result in increased reliability estimates. We also were provided information so that we could determine the level of association of each item on the scale with the total score of the scale. The obtained reliabilities are reported in Table 4.

TABLE 4
Alpha Reliabilities and Validity Correlations for Measures by Data Set

Measure	Self	Teacher	Data Set Supervisor	Date	Overall
Alpha Reliabilities					
Nonverbal Immediacy	.90	.92	.93	.93	.92
Warmth/Approachability	.69	.81	.82	.77	.80
Validity Estimates					
Correlations					
Between Measures	.58	.82	.77	.74	.75
Disattenuated Correlations	(.74)	(.95)	(.89)	(.88)	(.87)

The final data analyses focused on the predictive validity of the instrument. Correlations between scores on the research instrument and the criterion scale scores were obtained for each condition in the study and the overall data set.

RESULTS

Factor Analyses

The first data analysis focused on factor analyses. A separate factor analysis was conducted for each data set (self, teacher, supervisor, date) and the combined data set (including all four sub-sets). Kaiser's Measure of Sampling Adequacy (MSA) was calculated for each data set. The results indicate that all samples were adequate for analysis: overall data set, MSA = .93; self MSA = .86; teacher MSA = .91; supervisor MSA

= .92; date MSA = .91.

Our first step in interpreting the factor analysis results was to examine the loadings of the items on the first factor in the unrotated factor pattern matrix. Using the criterion suggest by Hatcher (1994) we judged any item with a loading of at least .40 on the initial factor (and no other loading $> .39$) to be loaded on the first factor. When factoring a truly single-factor scale, if an item does not meet this criterion, it suggests either that non-loading item represents another factor or that the item may simply not be a good item for measuring the intended construct. For the self, supervisor, and date data sets, all 26 items had a loading greater than .40 and no other loading that high. For the teacher and overall data sets, 24 items had a loading greater than .40 and no other loading that high. The remaining two items in both data sets had their highest loadings on the first factor and no other loading higher than that, but the loadings on the first factor were less than .40. The loadings for all items for each data set are reported in Table 1.

Since only two items out of 130 did not meet the test for loading on the first factor, the possibility that this observation was chance is high. However, we examined the two non-conforming items and found that both dealt with touch. We also examined the mean of each of these items in the teacher data set in comparison with other items in that data set and the touch means for the same items in the other data sub-sets. We determined that in the teacher data set, these two touch items had the lowest means of all the items on the measure. It was also observed that the means for these two items were much lower in the teacher data set than in the other subsets.

Items related to touch were present in the early measures of nonverbal immediacy of teachers (Andersen, 1978, 1979; Richmond, Gorham, & McCroskey, 1987). However, in measures developed later (which included efforts to produce shorter instruments) these items do not appear (McCroskey, Richmond, Sallinen, Fayer, Barraclough, 1995). Although teachers in early elementary schools frequently touch their students, it has been observed in studies involving college instructors that they are much less likely to do so for a variety of reasons (Richmond, Gorham, & McCroskey, 1987). We decided to retain these items in the scale since (as noted below) it was demonstrated that these items did not harm the reliability of the scale. However, they do enhance the content validity of the scale. From the earliest research with nonverbal immediacy in instruction, touch has been seen as a central element in nonverbal immediacy (Andersen, 1978). We believe that the reason these two items were weak in the teacher context is that the participants in this study were all college students. The fact that these participants reported that their teachers engaged in very few touching behaviors suggests the data from these items provided a restricted range, which very likely reduced the correlations between these items and the remaining items in the scale which did not have a restricted range. As a result, the obtained correlations between these items and the remainder of the items would not appear as equally strongly associated with the overall construct being measured.

Our second test of the dimensionality of the scale involved submitting the overall data set to factor analysis with oblique rotation. We first examined eigenvalues for all dimensions reported (scree test). It appeared that two factors might exist, but definitely no more than that. Hence, we examined results a the two-factor, oblique rotation. The correlation between the factors obtained was $-.61$, which indicates a strong correlation between the factors. An examination of the items loading on the different factors indicate that one factor included positively worded items while the other included negatively worded items. We conducted similar analyses for each of the subsets and

found essentially the same results, with only minor variation in the correlations between factors. These consistent results clearly indicated that the single-factor solution which we obtained initially was the best interpretation of the data.

The outcomes of this research were the Nonverbal Immediacy Scale-Self (NIS-S) and the Nonverbal Immediacy Scale-Other (NIS-O). These instruments are presented in Figures 1 and 2.

Basic Statistics

The next step in our data analyses was to obtain simple statistics related to our measures. Means, standard deviations, theoretic ranges, and obtained ranges for each measure are presented in Table 2.

The results of this analysis indicated that the means for the nonverbal immediacy scale on the four subsets of the data were very similar. The highest mean (self = 97.7) was only 4.3 points (on a 126 point scale) higher than the lowest mean (supervisor = 93.4). The obtained ranges were also very similar, with the exception of the self-report data where the obtained range was at least 20 points smaller than that for any of the other subsets. The results for the warmth/approachability measure were similar to those on the nonverbal immediacy scale. The highest mean (self = 16.7) was 2.0 points on a 16 point scale above the lowest mean (supervisor = 14.7). The obtained range on this scale was very similar to the possible range that could be anticipated.

The basic statistics for the measures were broken down by sex. These results are reported in Table 3. Consistent with the results discussed above, the means for nonverbal immediacy for the four subsets of the data were very similar for each sex. However, several sex differences were noted. Females generally rated the target (self or other) higher on the nonverbal immediacy scale than did the males. The exception was when they rated their dates. In this data set the male ratings of females and the female ratings of males did not differ significantly.

For most of the differences on the other data sets, for both the nonverbal immediacy scale and the warmth/approachability measure, the sexes were significantly different, but the observed difference only accounted for a comparatively small amount of the variance (2-4 percent). The exception was the observed difference on the self-report scales. Females saw themselves as much higher in nonverbal immediacy than did the males, the difference accounting for 13 percent of the variance. Similarly, the females saw themselves to be substantially more warm and approachable than did the males, accounting for 8 percent of the variance.

It was also noted that the standard deviations for females and males (either separately or together) in the self-report data set were substantially lower than in any other data set. They were approximately 1/3 lower than in any of the other-report data sets. This may be a reflection of the smaller range observed in this data set (noted above).

Alpha Reliabilities

The third set of data analyses focused on alpha reliability estimates. The reliability estimates are noted in Table 4. As indicated in the table, the reliability estimates for all of the data sets were at or above .90. The alpha analyses also indicated that in every data set every item was positively correlated with the total scores for both measures. The only two weak correlations observed (<.30) were for the touch items in teacher data set. The alpha analyses also indicated that removal of any item from any measure in any data set would not increase the reliability estimate for that measure.

Validity Estimates

The final data analysis centered on obtaining predictive validity estimates for the nonverbal immediacy scale from each data set. The measure of warmth/approachability served as the criterion variable. The obtained correlations (raw and disattenuated) are presented in Table 4. The raw validity correlations ranged from .58 to .82. The disattenuated validity correlations ranged from .74 to .95. The observed estimate for the self-report data set was lower than the other estimates, however all of the predictive validity estimates were substantial. The lower reliability of the warmth/approachability measure in this condition is seen as the most likely reason for this deviation.

Post Hoc Analysis

We conducted one *post hoc* analysis to explore a possible causal factor which could produce the kind of reduced reliability that had been observed in several previous studies employing shorter nonverbal immediacy measures. Since our examination of the new measure suggested that eight different types of nonverbal behavior were represented in the 26 items, we computed another factor analysis employing a forced orthogonal (varimax) eight-factor rotation. The eight factors we obtained were consistent with the eight different nonverbal behaviors being measured. This suggests that each of these types of nonverbal behavior may introduce unique variance. Hence, the full 26-item scale likely is measuring a hierarchical construct, nonverbal immediacy, which is influenced by each of these sub-factors. Were there more items for each of these dimensions, it probably would be possible to generate reliable subscores for each of these dimensions. This structure would be similar to the one found to be characteristic of the Personal Report of Communication Apprehension (Levine & McCroskey, 1990). By increasing the items in the measure for this study, it is likely that we increased the reliability for measuring each of the eight types of nonverbal behaviors, and in turn stabilized the reliability of the overall measure.

DISCUSSION

The primary goal of this research was to develop a measure of nonverbal immediacy which could be used as a self-report or an observer-report in a variety of communication contexts (instructional, organizational, interpersonal, etc.) with high reliability and validity. The results of the study reported above indicate that this goal was achieved.

A set of 26 items drawn from previous research was the basis for this new instrument. The scale items are balanced in terms of positively and negatively worded items. The factor analyses indicate that all of the items could be retained in the instrument for the self-report version and for the other-report across a variety of communication contexts.

It was determined that the reliability estimates for both versions of this instrument were .90 or above. This is substantially superior to previous nonverbal immediacy instruments used in communication research. The content validity of the instrument is very strong because it includes 13 different nonverbal components, with two items for each component. On its face, then, this instrument appears to represent the components of nonverbal immediacy which are considered by researchers and authors to be the essential components. This study also provided a preliminary indication of the

predictive validity of both versions of the instrument. The validity estimates for the total sample, and for the four subsets of the data, ranged from moderate to very high. Use of the instrument in future research should provide additional indications of the instrument's validity. At this point, it appears that the scale is both reliable and valid.

One caution is necessary. The results of our analyses of sex differences in this study pointed to a problem that only future research can resolve. In most of these analyses females rated the targeted individuals as more nonverbally immediate than males rated them. This difference was very substantial in the self-reports of nonverbal immediacy. This difference is consistent with arguments in the literature indicating the females are more sensitive to nonverbal cues than males and that females are more immediate than males. However, this difference did not appear in the data set involving targets of the opposite sex in a dating relationship. This is the context which might be expected to be the most likely to find such relationships, but none were found.

The power of the tests in this study was very high, high enough to identify very small but statistically significant differences between the sexes in all other contexts. However, no significant difference in this context was observed. This is a clear challenge to the assumption of females being more nonverbally immediate than males. It may be that females just think they are more nonverbally immediate. This alternative is strongly supported by the results on the self-report of nonverbal immediacy. Females saw themselves as much more nonverbally immediate than they saw any other type of target. Although they were not seen as more nonverbally immediate by their male dating partners, this could also be explained by the often alleged insensitivity to nonverbal immediacy cues on the part their male partners. Only future research can reconcile these conflicting explanations.

REFERENCES

- Andersen, J. F. (1978). The relationship between teacher immediacy and teaching effectiveness. Unpublished doctoral dissertation, Morgantown, WV: West Virginia University.
- Andersen, J. F. (1979). Teacher immediacy as a mediator of teaching effectiveness. In D. Nimmo (Ed.), *Communication Yearbook 3* (pp. 543-559). New Brunswick, NJ: Transaction Books.
- Burgoon, J. K., Buller, D. B., Hale, J. L., & deTurck, M. A. (1984). Relational messages associated with nonverbal behaviors. *Human Communication Research, 10*, 351-378.
- Gorham, J. S. (1988). The relationship between verbal teacher immediacy behaviors and student learning. *Communication Education, 37*, 40-53.
- Hatcher, L. (1994). *A step-by-step approach to using the SAS System for factor analysis and structural equation modeling*. Cary, NC: SAS Institute.
- Hess, J. A., Smythe, M. J., & Communication 451 (2001). Is teacher immediacy actually related to student cognitive learning? *Communication Studies, 52*, 197-219.
- Levine, T. R., & McCroskey, J. C. (1990). Measuring trait communication apprehension: A test of rival measurement models of the PRCA-24. *Communication Monographs, 57*, 62-72.
- McCroskey, J. C., & Richmond, V. P. (1992). Increasing teacher influence through immediacy. In V. P. Richmond & J. C. McCroskey (Eds.), *Power in the classroom: Communication, Control, and concern* (pp.101-119). Hillsdale, NJ: Lawrence Erlbaum.
- McCroskey, J. C., & Richmond, V. P. (1996). *Fundamentals of human communication: An interpersonal perspective*. Prospect Heights, IL: Waveland.
- McCroskey, J. C., Richmond, V. P., Sallinen, A., Fayer, J. M., & Barraclough, R. A. (1995). A cross-cultural and multi-behavioral analysis of the relationship between nonverbal immediacy and teacher evaluation. *Communication Education, 44*, 281-291.

- Mehrabian, A. (1966). Immediacy: An indicator of attitudes in linguistic communication. *Journal of Personality, 34*, 26-34.
- Mehrabian, A. (1971). *Silent messages*. Belmont, CA: Wadsworth.
- Mehrabian, A. (1981). *Silent messages: Implicit communication of emotions and attitudes* (2nd. ed.). Belmont, CA: Wadsworth.
- Richmond, V. P., Gorham, J. S., & McCroskey, J. C. (1987). The relationship between selected immediacy behaviors and cognitive learning. In M. A. McLaughlin (ed.), *Communication yearbook 10* (pp. 574-590). Newbury Park, CA: Sage.
- Richmond, V. P., & McCroskey, J. C. (2000a). *Nonverbal Behavior in Human Relations*, 4th edition. Needham Heights, MA: Allyn & Bacon.
- Richmond, V. P., & McCroskey, J. C. (2000b). The impact of supervisor and subordinate immediacy on relational and organizational outcomes. *Communication Monographs, 67*, 85-95.
- Robinson, R. Y., & Richmond, V. P. (1995). Validity of the verbal immediacy scale. *Communication Research Reports, 12*, 80-84.
- Rocca, K. A., & McCroskey, J. C. (1999). The interrelationship of student ratings of instructors' immediacy, verbal aggressiveness, homophily, and interpersonal attractions. *Communication Education, 48*, 303-316.