Handshaking, Gender, Personality, and First Impressions

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Although people's handshakes are thought to reflect their personality and influence our first impressions of them, these relations have seldom been formally investigated. One hundred twelve participants had their hand shaken twice by 4 trained coders (2 men and 2 women) and completed 4 personality measures. The participants' handshakes were stable and consistent across time and coders. There were also gender differences on most of the handshaking characteristics. A firm handshake was related positively to extraversion and emotional expressiveness and negatively to shyness and neuroticism; it was also positively related to openness to experience, but only for women. Finally, handshake characteristics were related to the impressions of the participants formed by the coders. These results demonstrate that personality traits, assessed through self-report, can predict specific behaviors assessed by trained observers. The pattern of relations among openness, gender, handshaking, and first impressions suggests that a firm handshake may be an effective form of self-promotion for women.

Handshaking is a common greeting behavior and is often one of the first observations that individuals make of each other upon meeting. Thus, the handshake may be a basis for some of the initial impressions that an individual forms about another. Although handshakes are anecdotally believed to communicate information about a person's personality, little systematic research has been done on the relation between handshaking and personality. Indeed, the extent to which handshaking is sufficiently stable across time and consistent across situations to reflect stable individual differences is largely unknown. Handshaking has also historically been more common among men than it has been among women or between men and women. However, we know little about gender differences in handshaking characteristics or about how gender may be involved in relations between personality, initial impressions, and handshaking. The purpose of the present research is to assess the generalizability of some characteristics of handshaking behavior across time and gender; to test some hypotheses about the relations among handshaking dimensions, personality, and gender; and to evaluate the relation between handshaking dimensions and initial impressions formed about strangers.

Characteristics of Handshaking

Handshakes can differ in a variety of ways. There is an extensive literature on handshaking in books on etiquette (e.g., Post, 1934; Reid, 1955; Vanderbilt, 1957) that refer to a number of dimensions on which handshakes differ, such as limp versus firm, dry versus clammy, or warm versus cold. Accompanying features, such as eye contact and skin texture, are also mentioned. Within the scientific literature, the only serious mention of handshaking characteristics can be found in the classic work by Allport and Vernon (1933, p. 34) on expressive movements, in which the authors briefly discuss individual differences in the dimensions of strength, duration, vigor, and grip, as well as differences in how the hand is offered.

Handshaking has historically been viewed as a male activity. Although probably apocryphal, legends about handshaking imply that the custom originated to provide a signal between male combatants that they would be nonaggressive (Eichler, 1937). Regardless of the accuracy of these legends, books on etiquette have clearly emphasized a gender difference in handshaking (e.g., Vanderbilt, 1957), in which men are expected to shake hands more frequently than women (Post, 1934).

Handshaking and Personality

There is a widespread belief that an individual's handshake reveals much about that person's personality. Vanderbilt (1957) suggested the trait-like properties of a handshake and its relation to personality: "A handshake is as much a part of personality as the way we walk, and although we may modify and improve a poor handshake if someone calls our attention to it, it will still usually be just like us, assured or timid, warm or cool" (p. 185). The predictions about the relation between handshaking characteristics and personality traits made by experts on the etiquette of hand-

shaking have a compelling face validity. However, there has been little systematic empirical study of the handshaking–personality relation. Thus, the validity of these conjectures is largely unknown. Indeed, a search of literature revealed only three articles, all studies conducted in Sweden by the same first author, that empirically address the relation between personality traits and handshaking characteristics.

One study (Astroem, Thorell, Holmlund, & d'Elia, 1993) was restricted to 29 psychiatric inpatients, so its generality is somewhat limited. A second study (Astroem, 1994) focused on normal adults and included 25 men and 25 women. However, the handshakes were initiated and evaluated by only one male experimenter who assessed all the participants. The handshakes were rated on four dimensions: temperature, dryness, strength, and consistency of grip. In addition, the vigor was assessed with a hand dynamometer, and eye contact was assessed by an independent rater. A variety of personality variables were assessed using a Swedish personality inventory based on Murray's theory of needs called the Cecarec Marke Personality Schedule (Cecarec & Marke, 1968). The results of this study suggested that temperature was related to rational dominance in women but not men, whereas dryness was related to sociability in men but not women. The most consistent findings were obtained for the strength of the handshake, which was positively correlated with aggression, dominance, exhibition, and rational dominance, and negatively correlated with sociability and defense of status (interpreted by the author as neuroticism). Astroem (1994) concluded, "As far as is known, this study is the first one confirming some theses of the conventional wisdom which hold that a handshake provides information on character" (p. 889). The final study (Astroem & Thorell, 1996) did not directly assess handshaking–personality relations, but was based on interviews with 47 individuals (therapists, clergyman, and car salesmen) who were thought to be experienced at engaging in and interpreting handshaking. The authors concluded that the inferences of the experienced handshakers were consistent with the empirical findings in their previous studies.

Handshaking and First Impressions

Regardless of any empirical support for a relation between handshaking and personality, it is generally believed that the handshake is an important component of the first impression that one forms of a person. This belief is evidenced in the large number of professional and business training seminars (e.g., Leadership Skills Inc., http://www.etiquette42day.com; Protocol School of Palm Beach, http://www.psopb.com; Polished Professionals, http://www.polishedprofessionals.com) that advertise proper handshaking as a component in their curriculum. However, empirical studies of the relation between handshaking characteristics and the initial impression or evaluation of a person are lacking.

In many circumstances a handshake provides an initial, standardized behavior sample from a person one is meeting for the first time. Moreover, nearly everyone will have an extensive set of handshake observations in their memory against which new handshakes can be compared and evaluated. Thus, it is reasonable to expect that a handshake might have an impact on the first impression one forms of an individual's personality. However, recent studies on the relation between specific behavioral cues and personality inferences (e.g., Borkenau & Liebler, 1992; Gangestad,

Simpson, DiGeronimo, & Biek, 1992) have not included a handshake in their repertoire of behavioral cues, so this conjecture remains untested.

The Present Study

Our study is designed to overcome some of the limitations of previous research and was guided by the consistent, but untested, beliefs about handshaking that we found in the literature on handshaking etiquette. We selected eight characteristics of handshaking that were frequently mentioned or implied by the existing literature. These characteristics were dryness, temperature, texture (to differentiate the cold, clammy handshake from the warm, dry one; Vanderbilt, 1957), strength, vigor, completeness of grip, duration (to differentiate the firm handshake from the boneless, limp one; Reid, 1955), and eye contact.

On the basis of the handshaking literature and the findings of Astroem and his colleagues (Astroem, 1994; Astroem & Thorell, 1996; Astroem et al., 1993), we selected nine personality dimensions to assess in our study. The view that good handshakes communicate sociability, friendliness, and dominance, whereas poor handshakes communicate social introversion, shyness, and neuroticism led us to select the Big Five Factors of Extraversion, Agreeableness, Neuroticism, and Openness to Experience as possible correlates of handshaking. We also included Conscientiousness to complete a broad representation of personality in our study. We supplemented the Big Five with an assessment of Shyness (Cheek & Buss, 1981), Emotional Expressiveness (Friedman, Prince, Riggio, & DiMatteo, 1980), and Positive and Negative Affect (Watson, Clark, & Tellegen, 1988).

One of the major goals of this study is to assess the consistency of an individual's handshake. Although Astroem et al. (1993) reported some reliability in the assessment of handshaking dimensions, his studies did not include a systematic assessment of handshakes across time or situations. Although the situation in the present study is limited to strangers participating in an experiment, we systematically assess the generalizability of handshakes across a 2 (times: greeting the participant and thanking the participant at the end of the experiment) x 2 (gender: male and female handshake coders) x 2 (individual coders within each gender) design. Thus each participant's handshake is rated a total of eight times during the entire study.

A second goal of the study is to describe any gender differences in the characteristics of handshakes. We expected that women's handshakes would be less strong, less vigorous, have a less complete grip, and be of shorter duration then men's handshakes. We expected the texture of men's handshakes to be rougher than women's, but on the basis of the general literature about eye contact (e.g., Argyle & Dean, 1965), we expected women to have more eye contact than men. We did not expect any gender differences on dryness or temperature.

A third goal of this study is to assess the relation between personality characteristics and handshaking characteristics. We intend to assess these relations in general, but on the basis of Astroem's (1994) finding that some of the relations between handshaking characteristics and personality differed for men and women, we will also consider the moderating effect of gender on these relations. In addition, because the handshake coders were aware of the participants' gender while evaluating the handshakes,

we will also assess the relation between handshaking and personality after statistically controlling for gender. The purpose of this analysis is to assess the extent to which any handshake–personality relations might be a spurious function of the influence of gender on the coder's ratings of the handshakes and the relation between gender and some of the personality variables.

Our final goal is to assess the relation between a person's handshaking characteristics and the initial impression that person makes on others. To obtain the initial impression, we asked each of the handshake coders to rate each participant on scales that correspond to the nine personality variables assessed in this study. Because of the influence of general factors, such as evaluation, on ratings of strangers (e.g., Paunonen, 1991), we recognize that the ratings of the coders on the different personality dimensions may not be highly differentiated. We will thus consider combining the ratings on different dimensions into more general composites reflecting an overall positive or negative impression of the participant. We expect that handshakes that are stronger, longer lasting, warmer, drier, more vigorous, with a more complete grip and more eye contact will result in a more favorable impression. We will again consider the moderating and possible confounding role of gender in these evaluations.

Method

Participants

One hundred twelve (48 men and 64 women) college undergraduates were offered course credit to participate in this study.

Raters

Four advanced psychology undergraduates (2 men and 2 women) served as experimenters and were trained as handshake coders in this study. The coders are the last four authors of this article. Thus, they were not blind to the general hypotheses about the relation between personality and handshaking characteristics. However, the focus of the coder's work until the study was completed was on developing agreement about the coding of the characteristics of the handshakes and on conducting the research. Detailed discussions of the findings and the conceptual contributions of these individuals to the interpretation of the results occurred after the data were collected. Also, other than handing the rating scales to the participants, the coders were completely uninvolved in obtaining these data and were unaware of the participants' scores on the self-report personality measures. Finally, the decision to obtain the coders' impressions of the participants' personality was made at the last minute, and the coders were unaware of the hypotheses regarding their impressions until after these data were collected.

Measures

Handshake ratings. The raters assessed the eight handshake characteristics on 5-point rating scales as follows: completeness of grip (1 = *very incomplete*, 5 = *full*), temperature (1 = *cold*, 5 = *warm*), dryness (1 = *damp*, 5 = *dry*), strength (1 = *weak*, 5 = *strong*), duration (1 = *brief*, 5 = *long*), vigor (1 = *low*, 5 = *high*), texture (1 = *soft*, 5 = *rough*), eye contact (1 = *none*, 5 = *direct*).

Personality ratings. The handshake coders made global ratings on a 5-point scale of each participant's personality on eight dimensions. Five of the dimensions represented the Big Five (Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience). One dimension concerned General Affect, ranging from 1 (*negative*) to 5 (*posi-*

tive). Another dimension concerned Shyness and a final dimension concerned Emotional Expressiveness, ranging from 1 (*not skilled*) to 5 (*skilled*).

Big Five Inventory–44 (BFI-44). The BFI-44 (Benet-Martínez & John, 1998) is a 44-item, self-report inventory designed to assess the Big Five Factors of personality. Eight items assess Extraversion, 9 items assess Agreeableness, 9 items assess Conscientiousness, 8 items assess Neuroticism, and 10 items assess Openness to Experience.

Positive and Negative Affect Scales (PANAS). The PANAS (Watson, Clark, & Tellegen, 1988) consists of 20 adjectives that are rated on a 5-point scale, ranging from 1 (*very slightly or not at all*) to 5 (*extremely*), concerning how a person feels. Various time frames can be used for the ratings. In this study, we asked participants to rate how they "generally feel." Ten of the items concern Positive Affect and 10 concern Negative Affect. The two scales are relatively independent.

Revised Cheek and Buss Shyness Scale (RCBS). The RCBS is a 13-item scale that assesses Shyness (Cheek & Briggs, 1990). It is a revision of the original 9-item Cheek and Buss Shyness Scale (Cheek & Buss, 1981).

Affective Communication Test (ACT). This is a 13-item scale developed by Friedman, Prince, Riggio, and DiMatteo (1980) to assess nonverbal Emotional Expressiveness.

Rater Training

Before the study began the four raters received 1 month of training and practice in shaking hands and evaluating the handshakes. In the initial training sessions the raters practiced offering their hand in a neutral way to initiate a handshake. The hand was extended straight out from the waist with the palm facing to the left and the thumb raised at a 45-degree angle. On contact with an individual's hand, the handshakers closed their hand around the other's hand, but waited for the other to initiate the strength of the grip and the upward and downward shaking. In addition, the raters were instructed to release their grip only when the participant began to relax his or her grip or otherwise showed signs of wishing to terminate the handshake. Raters practiced their handshaking technique on each other and on other individuals until we were satisfied that each had mastered the technique.

The next phase of training was understanding the eight handshaking dimensions included in the study and attaining agreement about those dimensions on handshakes that varied on the dimensions. Definitions of the dimensions were provided and extreme examples of each dimension were illustrated using a handshake. Individuals were then recruited to shake hands with the raters, with the instructions to try to shake hands in the same way with all four coders. Coders then rated the practice handshakes on all eight dimensions, and discrepancies in the ratings were discussed.

In the final training sessions, handshake ratings were obtained for 20 practice individuals; and interrater correlations, coefficient alpha, and corrected rater to total correlations were calculated. The interrater correlations ranged from .40 to .90 across all pairs of raters on all eight dimensions. Coefficient alpha, totaled across the four raters, ranged from .60 (temperature) to .85 (strength) across all eight dimensions. All of the rater to total correlations were positive and greater than .20. These values were viewed as acceptable for using the raters to assess the handshake characteristics. The raters did not receive any special training for the personality ratings other than being told a brief definition of each of the eight personality dimensions that they rated.

Procedure

Participants were recruited from introductory psychology classes for a study entitled "Personality Questionnaires." They obtained one of three required experimental credits for participating. The participants were scheduled in groups of four and were initially asked to come to a room in which they waited until all 4 participants arrived. When the participants

arrived, they were greeted by an experimenter and given a sheet of paper on which the following description of the experiment appeared:

Explanation of the Personality Questionnaires Experiment (Separate Condition)

One common method for assessing personality, attitudes, and beliefs is to ask people to describe their thoughts, behaviors, and feelings on questionnaires. Often a large number of questionnaires are administered together in a single packet. A possible problem with this method is that how a person answers questions on one questionnaire may be affected by their answers to other questionnaires. The purpose of this study is to try to find out if people tend to answer questionnaires differently depending upon whether the questionnaires are given together in the same packet or administered separately. You are participating in the condition where the questionnaires are administered separately.

In this condition we will ask you to complete four brief personality questionnaires. Each questionnaire will be administered by a separate experimenter in a separate room. To emphasize the separateness, each experimenter will greet you as though you were coming to them for an individual experiment. So, they will introduce themselves, shake your hand, ask your name, and ask you to come into the room where you will be given one questionnaire. This will happen four times during the experiment. (In the "together" condition the subjects will also come to this room and be greeted by one of the same experimenters, but would complete all the questionnaires in one room at the same time.)

So after you have read and signed the informed consent form you will be given a list with four letters on it: A, B, C, and D. When you are instructed to do so, go to room 235 and find the experimenter and room with the first letter on your list; when you are finished with that questionnaire you will be told to go to the experimenter with the next letter on the list and so on.

It is important that you answer the questions on each questionnaire as truthfully and carefully as possible.

Thank you very much for participating in this experiment. The results will be useful for helping us better understand how people respond to psychological measures.

The purpose of this description was to provide a cover story for why the participants would be administered four brief questionnaires by four separate experimenters and why so much handshaking would occur. The experimenter asked if the participants had any questions, reemphasizing that the participants should think of their experience as four separate experiments and that they would be formally greeted with and dismissed with handshakes and other formalities by the experimenters "to reinforce the participants' experience of separateness."

The participants then went to the experimental room, which consisted of a large central room and smaller rooms along its sides. Each of the four experimenters was standing next to one of the smaller rooms, and the participants were directed to the experimenter who matched the first letter on the list they had been given. Each experimenter greeted a participant by shaking his or her hand and then asked the participant to come into the smaller room, sit down at a desk, and complete one of the four personality questionnaires. During this time, the experimenters rated the participant's handshake on the eight dimensions and also rated their impressions of the participant's personality on the eight global rating scales. When a participant had finished completing the first questionnaire, he or she was thanked by the experimenter, who again shook the participant's hand and asked the participant to go back into the large room, have a seat, and wait for all the participants to finish. The experimenter then rated the second handshake on the eight handshake scales.

After all the participants finished the first questionnaire, they were sent to the second experimenter on the list. The process was repeated until each participant had shaken hands twice with all four experimenters and completed all four questionnaires. Different experimenters administered different questionnaires across the experimental sessions. The participants were then given their credit slips, asked if they had any questions or comments about the experiment, and told a phone number and individual to call if they wanted to know more about the experiment or any of the results. No participants indicated any suspiciousness about the handshaking.

Results

Generalizabilty of the Handshake Ratings

The eight ratings on each handshake dimension represent a 2 (time: 2 occasions) × 2 (gender: male or female coder) × 2 (individual coder: 2 of each gender) generalizability design. Table 1 presents the generalizability coefficients (coefficient alpha) for the eight scales across the eight ratings. The means and standard deviations for the eight ratings are also presented. As indicated in Table 1, the handshake ratings were generally consistent across time, gender, and individual coders.

Correlations Among the Handshaking Dimensions

Table 2 shows the correlations among the average of the eight ratings for the eight handshaking dimensions. As can be seen in Table 2, there are substantial correlations among some of the dimensions. In particular, the dimensions of duration, eye contact, completeness of grip, strength, and vigor are positively correlated. We created a composite variable by averaging the ratings of the five variables and will refer to this variable as the Firm Handshake Composite. Coefficient alpha for this composite is .88. The remainder of the analyses reported here will be based on this composite. Analyses of the individual handshaking dimensions are available from William F. Chaplin.

Gender Differences in Handshaking

To assess gender differences in handshaking we considered the gender of the participant, the gender of the coder, and their interaction in a 2 x 2 mixed analysis of variance. The two levels of coder ratings were the average of the four ratings made by the two

Table 1

Generalizability Coefficients, Means, and Standard Deviations for the Eight Handshake Rating Dimensions

Dimension	M	SD	Coefficient alpha
Strength	3.10	1.40	.91
Grip	3.84	1.16	.88
Dryness	3.30	1.19	.87
Temperature	3.86	1.01	.83
Vigor	1.91	0.89	.81
Duration	2.21	0.88	.77
Eye contact	4.35	0.72	.77
Texture	2.30	0.78	.70

Note. $N = 112$. The values are computed across the eight ratings, 2 (time periods) × 2 (gender) × 2 (coders within each gender). Ratings were made on a 5-point scale. Dimensions are ordered by the size of coefficient alpha.

Table 2
Correlations Among the Aggregate Handshake Ratings

Dimension	1	2	3	4	5	6	7	8
1. Duration	—							
2. Eye contact	.39	—						
3. Grip	.60	.57	—					
4. Strength	.84	.48	.80	—				
5. Vigor	.79	.32	.51	.76	—			
6. Texture	.35	.06	.32	.39	.22	—		
7. Temperature	.24	.26	.33	.37	.27	.22	—	
8. Dryness	−.18	.10	−.03	−.18	−.18	.32	.01	—

Note. $N = 112$. Correlations larger than .19 are significant at the .05 level, two-tailed test.

female coders and the average of the four ratings made by the two male coders on the Firm Handshake Composite. We found a main effect for participant gender, $F(1, 110) = 43.2$, $MSE = 0.95$, $r = .53$, and a main effect for coder gender, $F(1, 110) = 21.5$, $MSE = 0.26$, but no interaction. Male participants had a higher score on the Firm Handshake Composite ($M = 3.50$, $SD = 0.67$) than female participants ($M = 2.60$, $SD = 0.70$). Likewise, the male coders had a more positive impression of the handshakes they received ($M = 3.10$, $SD = 1.00$) than did the female coders ($M = 2.80$, $SD = 0.76$). However, the male and female coders still exhibited substantial agreement in their composite ratings. The correlation between the composite based on the female coders and the composite based on the male coders is .69.

Handshaking and Personality

Correlations between the personality scales and the handshaking dimensions. Table 3 presents the simple correlations between the personality scales and the Firm Handshake Composite. These correlations suggest that individuals whose handshakes are firmer (i.e., have a more complete grip, are stronger, more vigorous, longer in duration, and associated with more eye contact) are more extraverted and open to experience and are less neurotic and shy.

The effect of controlling for gender on the handshaking–personality relation. We also assessed whether the associations between the Firm Handshake Composite and personality could be

Table 3
Correlations Between the Firm Handshake Composite and the Personality Scales

Personality scale	Firm Handshake Composite
Shyness	−.29
Neuroticism	−.24
Openness	.20
Extraversion	.19
Emotional Expression	.16
Positive Affect	.14
Negative Affect	−.09
Conscientiousness	−.08
Agreeableness	−.06

Note. $N = 112$. Correlations larger than .19 are significant at the .05 level, two-tailed test. Dimensions are ordered by the magnitude of their correlation with the Firm Handshake Composite.

attributed to the mutual influence of gender on both variables. Thus, we calculated the partial correlations between the Firm Handshake Composite and personality after controlling for gender. Interestingly, the partial correlation between the Firm Handshake Composite and Extraversion is larger (.31 vs. .19) after gender was controlled for. This was also true for Emotional Expression (.31 vs. .16) and for Shyness (−.35 vs. −.29). The relation between Neuroticism and the Firm Handshake Composite was reduced after partialling out gender (−.12 vs. −.24). For Openness to Experience, the relation was essentially unchanged (.19 vs. .20).

The moderating effect of participant gender on the personality-handshaking relation. We also considered the possibility that the relation between personality and handshaking characteristics would be different for men and women. We evaluated the moderating effect of gender on the personality–handshaking relation by using hierarchical regression analysis to assess the contribution of the partialled product of Gender × Firm Handshake (with gender and firm handshake controlled) to predicting each of the nine personality variables. We found a significant moderating effect of gender on the relation between the Firm Handshake Composite and Openness to Experience (semi-partial correlation = .18), $t(108) = 2.18$, $p = .031$. A plot of the regression line for predicting Openness to Experience from the Firm Handshake Composite separately for men and women indicated that women who had a firmer handshake were more open to experience (regression coefficient = .32). For men, there was little relation between their handshake and how open they were (regression coefficient = −.06).

Handshaking and First Impressions

In addition to rating the handshaking characteristics of the participants, the coders also rated each participant's personality on eight dimensions that corresponded to the personality scales the participant had completed. The coders exhibited a reasonable degree of consistency in their personality ratings across the 112 participants (coefficient alphas ranged from .37 to .65, and all the corrected coder-to-total ratings were positive). Thus, we aggregated the ratings across the four coders. However, we found that the aggregate of the coders' personality ratings on the eight scales were substantially correlated (all correlations were positive and ranged from .21 to .92). As we expected, the coders, who did not know the participants, appear to have based their ratings on a general impression factor, such as evaluation. If a participant made

a good impression, the participant tended to be rated higher on extraversion, conscientiousness, agreeableness, emotional stability, openness, emotional expression, outgoingness (the opposite of shyness), and positive affect. A poor impression tended to elicit lower evaluations on these dimensions. Thus, we elected to form a composite of the eight personality ratings (after reverse scoring the Shyness scale), which we named the First Impression Composite. Coefficient alpha for this First Impression Composite across the eight personality scales was .92.

This composite is essentially uncorrelated with participant gender ($r = .05$). However, it was correlated with several of the self-report personality scales; specifically, Extraversion ($r = .35$), Emotional Expressiveness ($r = .37$) and Shyness ($r = -.36$). Interestingly, we also found that there was an interaction between gender and Openness for predicting the First Impression Composite (the semipartial r for the interaction between gender and Openness for predicting the impression is .20), $t(108) = 2.13$, $p = .04$. To interpret this interaction we examined the relation between Openness and First Impression separately for men and women. For women, Openness is positively related to First Impression (regression coefficient = .26), $t(62) = 1.82$, $p = .07$, whereas for men Openness is negatively related to First Impression, although this relation is weaker (regression coefficient = $-.22$), $t(46) = -1.30$, $p = .20$. Thus, women who are more open make a more favorable impression, whereas more open men make a slightly poorer impression. The correlation between the First Impression Composite and the Firm Handshake Composite is .56. This relation is consistent across the total sample and for male and female participants considered separately. It is also consistent across the male and female coders.

Discussion

Summary and Interpretation of the Results

We found that an individual's handshake is stable across time and consistent across gender. We also found that five of the eight handshaking characteristics that we studied covaried. These five characteristics (strength, vigor, duration, eye contact, and completeness of grip) represent what the literature on handshaking etiquette refers to as a firm handshake, and we focused our analyses on this composite. We found that men's and women's handshakes differ on most of the dimensions we studied and on the Firm Handshake Composite. Specifically, the male participants' handshakes were generally viewed as firmer.

A person's handshake is related to some aspects of his or her personality. Specifically, an individual with a firm handshake is more extraverted and open to experience and less neurotic and shy. We find these correlations persuasive, because the source of data for the handshakes (trained coders) is independent of the source of data for the personality variables (multi-item, self-report scales). We were concerned that the relation of gender to handshaking and to personality might be the basis for these results. However, when we partialed gender for these correlations, the partial correlations between a firm handshake and extraversion, shyness, and emotional expressiveness were larger than the simple correlations. This suggests that those aspects of handshaking that are related to gender are not the basis for handshaking's relation to these personality variables. Indeed, for extraversion, shyness, and emo-

tional expressiveness, gender operates to suppress some of the handshaking variance that is unrelated to these characteristics.

Only the relation between neuroticism and handshaking can be partially explained by a mutual association with gender. Finally, we also found that the general relation between Openness and a firm handshake is complicated by a moderating effect of gender. Specifically, it was only for the women participants that Openness is related to a firm handshake; women who are more open to experience have a firmer handshake than women who are less open.

Regardless of the accuracy of the impressions formed about individuals on the basis of their handshake, the literature on handshaking etiquette and business protocol strongly suggests that a handshake has a substantial impact on how people evaluate others. We were somewhat disappointed, although perhaps not surprised, that our coders did not differentiate among the eight personality characteristics they rated. Instead these ratings seem to be influenced by the general first impression the coders formed of the participants, who were strangers to the coders. This general impression factor precluded us from exploring the accuracy of the coder's impressions at predicting the personality measures. Instead, we formed a First Impression Composite and restricted our analyses of the relation between handshaking and personality inferences to this composite. Consistent with the etiquette and business literature, we found a substantial relation between the features that characterize a firm handshake and the coder's first impression. We did not, however, find any substantial gender differences in the impressions formed by the coders and the handshake characteristics.

All of these interpretations must be made in light of the limitations of this study. We view the major limitation as the restricted situation in which we assessed the handshakes. Specifically, the handshaking occurred between strangers in a situation in which the interaction between the individuals was brief and somewhat formal. That is, the coders and participants greeted each other in a context in which there was no expectation that their interaction was the beginning of a long association. Thus, the participants were unlikely to be invested in making a good impression and the handshakes and greetings were probably more perfunctory than would be the case in more committed interactions. We believe that the main result of this limitation is to attenuate the variance on some of the handshaking characteristics. Thus, any of our null results might be a function of the lack of variability in the handshakes. Despite this limitation, we did find a number of effects. Also, although our experimental situation was limited, it is not an uncommon situation in which handshaking occurs and in which impressions are formed.

Implications

What, then, are the implications of these results for the personality literature? Our results are relevant to a number of issues that have been of central concern to the field of personality. We consider the long-standing concern about how personality relates to behavior (e.g., Kenrick & Funder, 1988) and how individuals form impressions of others (e.g., Kunda & Thagard, 1996). In addition, we discuss the implications of these results for self-promotion strategies that women may use in impression management (Rudman, 1998).

The relation between personality and behavior. The extent to which broad personality traits can predict behavioral characteristics has been a source of some controversy in the field of personality (Paunonen, 1998). Although discussions about this issue have become more enlightened (e.g., Funder, 1991), demonstrating clear links between personality traits and observed behavior remains an important goal for the field (Caspi et al., 1997). Our results provide several examples in which broadly measured personality traits such as extraversion, neuroticism, and openness, as well as more specific characteristics such as shyness, are predictive of handshaking behaviors. Consistent with Epstein's (1983) observations, we found evidence of this trait–behavior relation after aggregating our behavioral observations across eight assessments. We would also emphasize that the behavioral measures were obtained from a set of coders, whereas the personality measures were obtained from the participants. Thus, we avoided a common confound in studies of behavior–personality relations by obtaining the personality and behavioral measures from separate sources (Paunonen, 1998).

The basis for personality inferences and impressions of people. There has long been an interest in the factors that influence people's initial impressions of each other. In general, these impressions are thought to be influenced by stereotypes based on factors such as gender or age, base-rate information, beliefs about trait correspondence, and physical attractiveness, as well as the specific behaviors we observe. It has proven particularly difficult to isolate the influence of specific behavioral observations in this process. A major effort to further the understanding of how behavioral observations influence impression formation and personality inference was reported by Borkenau and Liebler (1992). In addition to assessing how these behaviors influence impressions, Borkenau and Liebler also evaluated the accuracy of those inferences. They found some evidence that individuals do use specific physical and behavioral observations in forming impressions and that there is some small degree of accuracy in their inferences. Gangestad, Simpson, DiGeronimo, and Biek (1992) described a similar study, but found little correlation between the behavioral cues they assessed and the inferences made by the participants. Our results on the relation between handshaking and the coder's impressions suggest that behavioral cues derived from handshaking can have an influence on impression formation. Of course, our study was not as controlled as the those described by Borkenau and Liebler (1992) or Gangestad et al. (1992). Thus, we could not unconfound all the other information that our coders may have used in forming their impressions from the handshaking characteristics. Nonetheless, investigators studying the relation between behavior and impression formation might consider including handshaking in the set of observed behaviors.

Gender and self-promotion. Although we did not find any direct relation between gender and the favorability of the coders' first impressions ($r = .05$), we did find an interaction between gender and Openness to Experience in relation to the favorability of the coders' impressions: More open women are perceived more favorably than less open women, whereas more open men are perceived slightly less favorably than less open men. We were intrigued by this finding, especially because of the correlation between gender and a firm handshake ($r = .53$), the correlation between a firm handshake and a favorable impression ($r = .56$), and the interaction between gender and Openness to Experience

for predicting a firm handshake (semipartial $r = .18$). We speculated that the relation of the Gender × Openness interaction to first impression might be mediated by the firmness of these individual's handshakes.

To evaluate this speculation we followed the procedures outlined by Baron and Kenny (1986) to assess mediation. We found a strong unique correlation between firmness and impression in the presence of the Gender × Openness interaction (semipartial $r = .66$), $t(107) = 9.5$, $p < .000001$. Moreover, the unique relation between the Gender × Openness interaction and favorable impression drops to near 0 (semipartial $r = .06$), $t(107) = -0.97$, $p = .33$, in this analysis, suggesting that in this study the relation between the Gender × Openness interaction and favorable impression was fully mediated by firmness of handshake. Further support for a full mediation model comes from path analyses of these variables. A model with a path from the Gender × Openness interaction directly to favorable impression and a path through firmness of handshake fit the observed covariances well, $\chi^2(1, N = 10) = 0.234$, $p = .63$. However, the fully mediated model that eliminates the direct path from Gender × Openness to favorable impression also fit the observed covariances well, $\chi^2(2, N = 10) = 1.212$, $p = .55$, and the difference between these chi-squares ($.978$, $df = 1$) is not significant ($p = .32$).

In summary, we found that women who are more liberal, intellectual, and open to new experiences have a firmer handshake and make a more favorable impression than women who are less open and have a less firm handshake. For men, the relations among these variables are substantially weaker, but in the opposite direction: More open men have a slightly less firm handshake and make a somewhat poorer impression than less open men. The differential relation between openness and favorable impressions for men and women is, in this study, almost completely mediated or "explained" by the nature of the person's handshake. We emphasize that these findings were not expected and are in need of replication (Kerr, 1998). However, the size of the effects in this set of mediational analyses are, bluntly speaking, huge. Thus, we are cautiously optimistic about their replication.

We think that the implications of these analyses for self-promotion strategies used by women may be important. Women have historically been at a disadvantage relative to men when competing for jobs (Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972). Glick, Zion, and Nelson (1988) argued that to remove this historical disadvantage women need to overcome the general impression that they are less competent or qualified. However, overcoming this impression has costs for women, because behaving assertively and confidently often results in a more negative impression for a woman relative to an assertive and confident man (e.g., Butler & Geis, 1990; Eagly, Makhijani, & Klonsky, 1992). Our results provide one instance in which women who exhibit a behavior (a firm handshake) that is more common for men and that is related to confidence and assertiveness are evaluated more positively than are women who exhibit a more typical feminine handshake. More important, the predicted favorable impression score for women who are 1 standard deviation above the mean on the firmness of their handshake is 3.61 (on a 5-point scale), whereas men who are 1 standard deviation above the mean on firmness are predicted to score 3.45 on impression. This result differs from the typical finding that women who exhibit confident

behavior that is similar to the behavior of men often make a more negative impression than the men.

Of course, this finding is limited to situations in which a handshake is given and probably also to situations in which the focus is on the person's handshake, as in the present study. But this situation is similar to the real-world situations of business contacts, employment, and school interviews. In these situations, giving a firm handshake may provide an effective initial form of self-promotion for women that does not have the costs associated with other less subtle forms of assertive self-promotion.

Conclusion

It would be something of an overstatement to claim that a person's handshake provides a window to his or her soul. However, we did find that handshakes are stable and consistent across time and gender, at least within the limitations of this study. Also, handshaking characteristics are related to both objective personality measures and the impressions people form about each other. Given what we know about the potency of first impressions, it might be a good idea to heed the recommendations of experts on handshaking etiquette and try to make that first handshake a firm one.

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