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EFFECT OF GENDER-TYPES ON INTERPERSONAL STRESS MEASURED BY BLINK RATE AND QUESTIONNAIRES: FOCUSING ON STEREOTYPICALLY SEX-TYPED AND ANDROGYNOUS TYPES

KUMI HIROKAWA
Kwansei Gakuin University, Japan

FUMIO YAMADA
Osaka Prefectural College of Nursing, Japan

ITSUKO DOHI
Kobe Shoin Women's University, Japan

YO MIYATA
Kansai University of Social Welfare Sciences, Japan

Kumi Hirokawa, Department of Psychology, Kwansei Gakuin University, Japan; Fumio Yamada, Laboratory of Psychology, Osaka Prefectural College of Nursing, Japan; Itsuko Dohi, Faculty of Letters, Kobe Shoin Women's University, Japan; Yo Miyata, Department of Social Welfare, Kansai University of Social Welfare Sciences, Japan.
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This paper is based on a re-analysis of the experiment which was reported in *Japanese Psychological Research* (Hirokawa, Dohi, Yamada, & Miyata, 2000). Herein the analysis focuses on the participants' blink rate, which has not been reported previously.
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Please address correspondence and reprint requests to Kumi Hirokawa, Department of Public Health, Gifu University School of Medicine, 40 Tsukasa-machi Gifu, Gifu 500, Japan. Phone: +81-58-267-2247; Fax: +81-58-265-9020; E-mail: <k-umi@cc.gifu-u.ac.jp>

This study was conducted to determine how differences of self gender-type and partner's gender-type in Japan had an effect on interpersonal stress (anxiety/uneasiness) during a conversation among mixed-sex pairs. The level of interpersonal stress was discussed in relation to blink rate. The participants were assigned to one of the following four pair types: (a) Male and female were androgynous (maleA-femaleA); (b) Male was androgynous and female was stereotypically sex-typed as feminine (maleA-femaleST); (c) Male was stereotypically sex-typed as masculine and female was androgynous (maleST-femaleA); (d) Both were stereotypically sex-typed (maleST-femaleST). Dependent measures were (1) Blink rate during five-minute conversation of one-minute intervals, and (2) Questionnaires (State-Trait Anxiety Inventory I and Iceberg Profile). Results suggested that participants who had a conversation with an androgynous partner reduced their interpersonal stress.

People have two kinds of sexual identity; one is biological sex, the other is sociological sex (gender). Stereotypically sex-typed males have *Masculinity*, which is more socially desirable for men than for women, and which is associated with an instrumental orientation. Some characteristics of masculinity include assertiveness, activity, and determination. Stereotypically sex-typed females have *Femininity*, which is more socially desirable for women than for men, and which is associated with an expressive orientation. Some characteristics of femininity include kindness, commonality, and submissiveness. An individual who has both masculinity and femininity is called *Androgynous*, and is considered to be able to flexibly adapt to different conditions; i.e. an androgynous person can be either a good leader, or a good follower (Bem, 1974; Spence, Helmreich, & Stapp, 1975).

Many studies on self gender identity have been conducted since the work of Bem (1974), and they have revealed individual differences in sex role orientation (Markstrom, 1989; Marsh & Byrne, 1991; Taylor & Hall, 1982; Whitley, 1983). According to Marsh and Byrne (1991), some studies proposed that an individual who had been stereotypically sex-typed corresponding to his/her sex would have a healthier mental life, whereas others suggested that only masculinity would be related to social and mental health. One of their hypotheses argued that an androgynous person high in both masculinity and femininity would be able to have higher social adaptability and better mental health (Falbo, 1982; Kelly, O'Brien & Hosford, 1981; Wiggins & Holzmuller, 1981). Moreover, even though there have been few studies on adaptability of conversation among more than two people, Ickes and Barnes (1978) reported that stereotypically sex-typed individuals behaved inflexibly and rigidly during communications. They assessed participants' conversational involvement by measuring the duration of time and the frequency of verbalization, mutual gaze, gesture and personal space. Ickes, Schermer and Steeno (1979) repeated their study with same sex pairs, and they suggested that the androgynous type was likely to facilitate conversational involvement. The results obtained by Lameke and Bell (1982) also showed pairs of androgynous females to be more able to develop relationships than pairs of feminine and undifferentiated

females, by measuring signs of interpersonal attraction and behavioral conversation, such as verbalizations, gestures, and mutual gazes.

The present study was also conducted to determine how gender-type differences (i.e. androgynous (A) vs. stereotypically sex-typed (ST)) affect interpersonal stress during a conversation with a different sex partner. In this study, *interpersonal stress* means *the anxiety or uneasiness that occurs during a first meeting.* To assess this interpersonal stress, this study adopted blink rate as a psycho-physiological index, as well as difference of state of anxiety and uneasiness between pre- and post- conversation. Hirokawa, Dohi, Yamada and Miyata (2000) reported that the androgynous type was less nervous, had more abundant conversation, and had a closer personal space than did either stereotypically sex-typed gender, by assessing several behavioral conversations. The present study measured blink rate during the same social situation by using video equipment.

According to Tada, Yamada and Fukuda (1991), there are three types of blinks: *voluntary*, *reflexive*, and *spontaneous*. *Spontaneous* blinks can be neither voluntary nor reflexive, because no external reflexive stimulus can be specified. They are assumed to be associated with psychological states. For example, Tecce (1989) suggested a two-process model to explain the relationship between spontaneous blink rate and psychological functions. Frequency of the blink rate increased in the situation of unpleasant state and internal attention, whereas it decreased in the situation of pleasant state and external attention. Tada (1986) discussed the association between blink rate and interest and curiosity; blink rate decreased in high interest and curiosity, whereas it increased in low interest situations.

The preceding studies (Ickes & Barnes, 1977, 1978; Ickes et al., 1979; Lamke & Bell, 1982) assessed behavioral conversation and satisfaction by using self-report, but they did not consider the participants' physiological state. Measuring blink rate would be adequate to assess the mental state during a conversation situation, since it is possible to measure the blink rate by observation of the video without the use of an electrode. Especially in social situations such as a group discussion and a conversation among more than two persons, as in this experiment, the blink rate allows an experimenter to analyze one aspect of the mental state by counting it utilizing the video record. Hirokawa, Yagi, and Miyata (2000) also assessed blink rate during conversation situations, and suggested that the blink rate could be an index of physiological state. Regarding the relationship between stress and blink rate, the present authors expected that when an individual felt anxiety or tension, his/her blink rate would increase. Conversely, when an individual was involved in a conversation or attracted to his/her partner, it would decrease. Since an androgynous type was supposed to affect interpersonal stress, this study hypothesized that participants who have a conversation with an androgynous partner should feel lower interpersonal stress, and their blink rate should be lower than that of those with a stereotypically sex-typed partner.

METHOD

Design

The design compared four different pair types based on Ickes and Barnes (1978): (a) Both were androgynous (maleA-femaleA); (b) The male was androgynous and the female was sex-typed as feminine (maleA-femaleST); (c) The male was stereotypically sex-typed as masculine and the female was androgynous (maleST-femaleA); and (d) Both the male and the female were stereotypically sex-typed corresponding to their gender (maleST-femaleST).

Participants and Pretesting

The first step of the procedure was the screening of participants by using the Masculinity-Humanity-Femininity scale (MHF: Ito, 1978) for 517 undergraduate university students in Japan (262 males, 255 females). The MHF scale is a gender scale in Japanese consisting of 10 masculinity and 10 femininity items, rated from (1) *never true* to (5) *always true*. This screening was based on the median of masculinity scores (males=31.5, females=30.0) and femininity scores (both sexes=29.0). All the students who had been subjected to this screening procedure were then divided into four categories. The *androgynous* type was defined as scoring higher in both masculinity and femininity in comparison to the medians (79 androgynous males and 74 androgynous females). *Masculinity* was defined as scoring higher in masculinity and lower in femininity in comparison to the medians (52 masculine males and 67 masculine females). *Femininity* was defined as scoring higher in femininity and lower in masculinity, again in comparison to the medians (57 feminine males and 57 feminine females). Finally, the *undifferentiated* group was defined as scoring lower in both scores than the medians (74 undifferentiated males and 57 undifferentiated females). In the questionnaire, there was a place to write a participant's name and telephone number, which were asked as an indication of consent to participation in this experiment. The experimenter telephoned every participant according to this agreement to schedule the date and the time. The participants were offered the choice of declining to participate in the experiment at this time. The number of screened participants resulting from this process were as follows: (a) maleA-femaleA pairs consisted of 8 males and 8 females, (b) maleA-femaleST pairs consisted of 6 males and 6 females, (c) maleST-femaleA pairs consisted of 5 males and 5 females, and (d) maleST-femaleST pairs consisted of 7 males and 7 females. Since some video data were impossible to analyze because the cameras were out of focus, the number of participants for blink rate is sometimes different, as indicated by the parentheses in Table 1.

TABLE 1
THE NUMBER OF SUBJECTS WHO PARTICIPATED IN THE EXPERIMENT

	Androgynous	Stereotypically Sex-Typed
male	14	12 (8)
female	13 (11)	13 (11)

Note: The number of subjects for the blink-rate is shown in parentheses.

PROCEDURE

The procedure of this experiment was that, before each session, a pair of participants were told to fill out questionnaires: State-Trait Anxiety Inventory I (STAI: 20 items to assess anxiety state, scaled from (1) *I do not feel at all* to (4) *I feel extremely*; Kishimoto & Terasaki, 1986); and Iceberg Profile (IP: 6 items to assess uneasiness state, scaled from (0) *low* to (6) *high*; Oka, Takenaka, & Sakata, 1994). Pairs of participants were led to the experiment room, where a table (120cm x 180cm x 70cm) and two chairs were set. All shelves were sealed with black cloth and two video cameras were located behind the cloth. Each video camera was focused on the face of one of the participants in order to record blinks. When they were seated in the experiment room, no matter which chair they had chosen, the experimenter instructed that they would have a five-minute conversation in order to assess their partner's impression. Since the experimenter did not specify which kinds of topics they were to discuss, participants could talk as they liked. During this conversation, the participants' behavior and conversation were videotaped. After each session, they were again instructed to fill out the same questionnaires (STAI and IP). At the end of each experiment, the experimenter explained the purpose of the experiment and the reason for having made the video recording from behind the cloth, and she also asked every participant to analyze the video data. No participant declined to analyze the video data.

RESULTS

BLINK RATE

The blink rate of each participant was counted in one-minute intervals (blink/min) by observing the video. A repeated-measures analysis of variance (ANOVA) showed no significant effect of either sex or of time interval. In order to examine the effects of self gender-type and partner's gender-type, a 2 x 2 repeated-measures analysis of variance (ANOVA) was performed. The result showed that a self gender-type by time interval interaction was significant ($F(4,156) = 2.47$, $p<.05$) (Figure 1). According to Duncan's multiple comparison test, there were several significant differences. Comparing androgynous participants to sex-typed participants, androgynous participants had significantly higher blink rates than did sex-typed participants at third and fourth minute intervals (blink rate at 3 min: A=25.6 blinks/min, ST=19.8 blinks/min; at 4 min: A=23.2 blinks/min, ST=19.0 blinks/

min) ($p<.01$). Regarding androgynous participants, there was a significant difference between first and third minute intervals (A:1 min=21.1 blinks/min, 3 min=25.6 blinks/min) ($p<.05$).

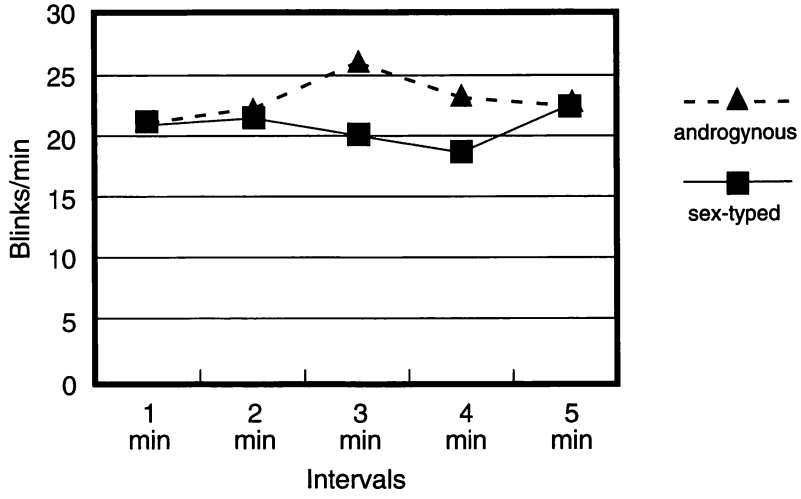

Figure 1: Blink rates at one-minute intervals in self gender-types.

Questionnaires

A repeated-measures ANOVA showed no significant effect of sex, but showed that there were significant differences between pre- and post-encounter periods of participants' anxiety (STAI) and uneasiness (IP) (STAI: $F(1, 51) = 14.25, p<.001$; IP: $F(1, 50) = 28.17, p<.0001$). Both males and females reduced their anxiety and uneasiness after a conversation. The results of the questionnaires were compiled as the difference between pre- and post-encounter, of which higher scores showed more reduction of anxiety and uneasiness than lower scores. In order to examine the effect of self gender-type and partner's gender-type during a conversation, a 2x2 ANOVA was performed. The main effect of the partner's gender type (A/ST) was significant on IP ($F(1,48) = 6.22, p<.05$); therefore the participants who interacted with an androgynous partner exhibited significantly reduced uneasiness after the encounter. Figure 2 shows the mean scores of IP of difference between pre- and post-conversations by the partner's gender-types (A=4.06, ST=1.51).

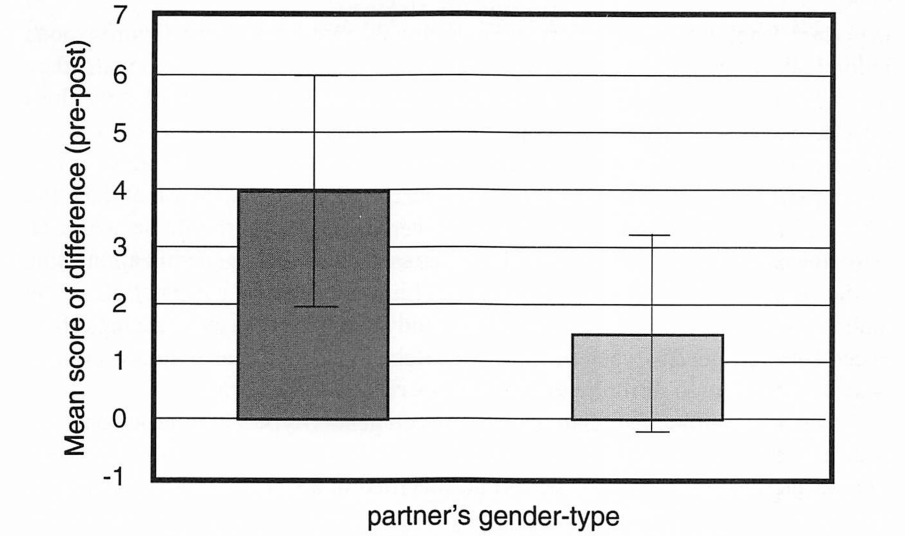

Figure 2: Mean scores of IP of difference between pre- and post- conversations by partner's gender-type.

DISCUSSION

Regarding the results from the questionnaires, both males and females who had a conversation with an androgynous partner reduced their uneasiness. Many preceding studies, which had examined only self gender-type (Bem, 1975; Campbell, Steffen & Langmeyer, 1981; Dohi, 1995), have suggested that androgynous individuals could more easily control their stress than could other gender-types. However, the present study showed that the androgynous trait might be related to the reduction of interpersonal stress. There are many possible reasons for this. For example, Wiggins and Holzmuller (1981) suggested that the index of androgynous type reflected interpersonal flexibility. Also, others discussed how the androgynous personality could be better related to interpersonal adjustment than could other groups (Johnson & Brems, 1989; Petry & Thomas, 1986). In sum, since androgynous individuals are supposed to have some skills needed in interpersonal situations, individuals who interact with them may reduce their uneasiness during the initial encounter.

However, the present findings from blink rate suggested that androgynous individuals might feel more interpersonal stress than sex-typed individuals during a five-minute conversation (shown in Figure 1). The study by Hirokawa et al. (2000) suggested that androgynous individuals might have better interpersonal adjustment

than sex-typed individuals by assessing the videotapes: i.e. not nervous, interested in partner, leading a conversation, and enjoying the interaction. Since androgynous individuals seemed to be able to perform better than sex-typed individuals, they might feel more stress to make an abundant conversation and to lead it at the third interval during a five-minute interaction. On the other hand, it is better to consider that the base blink rate, which should have been videotaped during the non-conversation period, was — unfortunately — not measured. The comparison of the blink rates during conversation to that of non-conversation periods should be analyzed. Also, the present study did not include a large sample, thus the generalization value of the results is reduced. Even though the blink rate results were not clear, the authors believe that an implication of this study, which was to evaluate the differences between gender-types in terms of effects on interpersonal stress, permits positive anticipation of future gender studies related to blink rate.

To further examine the relationship between gender-type and interpersonal adjustment, effective communication skills — which are associated with the reduction of interpersonal stress — should be specified in a future study. According to the study by Zuckerman, DeFrank, Spiegel and Larrance (1982), communication skill was related to masculinity-femininity rather than to biological sex differences. They proposed also that communication skill might be strongly associated with the androgynous personality trait, because this trait was supposed to be more flexible than sex-typed traits (Freidman, Price, Riggio & DiMatteo, 1980; Wada, 1991). Although, in the present study as well, only androgynous and sex-typed traits were selected, as Norlander, Erixon, and Archer (2000) examined differences of creative ability among five gender-types, the effects of other gender-types such as undifferentiated and cross gender-typed (a feminine male and a masculine female) should be investigated in future studies. If the idea that the androgynous type has more effective communication skills is supported, then this personality trait will be seen as more socially desirable.

Also, it should be added that the present study was conducted in Japan, so the results were influenced by Japanese culture. According to Suga and Dohi (1995), Japanese society has a tendency to consider a couple as one unit. That is, since a couple is considered to have a complementary relationship in Japan, whether an individual is androgynous or not may not matter. It is necessary to keep in mind that interpersonal situations are more or less influenced by cultural characteristics.

In their social life, people are expected to behave in a masculine or feminine fashion. It must be supposed that there are many people who have felt pressure to be a man or to be a woman, and who have also felt that it was impossible to understand what the opposite sex was thinking. Tannen (1990) described how the conversation between men and women was really like cross-cultural communication. However, to communicate better and to understand each other better, interpersonal communication as related to masculinity-femininity should be investigated further.

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