

A Study of Nonverbal Communication by Coaches: Relationships between Communication Ability and Coaching Evaluation*

Takashi Shimazaki¹ and Masao Kikkawa²

¹Faculty of Human Sciences, Waseda University
2-579-15 Milkajima, Tokorozawa-city, Saitama-pref., 359-1192, Japan
shimatakashi1203@ruri.waseda.jp

²School of Physical Education, Tokai University
4-1-1 Kitakaname, Hiratuka-city, Kanagawa-pref., 259-1292, Japan

*Original article published in Japan J. Phys. Educ. Hlth. Sport Sci. 57: 427-447, 2012 (in Japanese)
[Received March 13, 2015; Accepted May 8, 2015; Published online May 21, 2015]

The purpose of this study was to construct a nonverbal communication scale for coaches (NCSC) and examine the relationships between nonverbal communication (NVC), communication ability, and coaching evaluation.

Study 1 involved the construction of the NCSC. Adolescent athletes (N = 166) completed a questionnaire that measured coaches' nonverbal communication (perceived frequency and impression). Eight factors were identified via exploratory factor analysis. These factors were negative NVC (unfavorable impression formation, negative attitude, unacceptable attitude, and exhibition of perplexity) and positive NVC (positive distance, positive gesture, positive touching, and positive expression).

In Study 2, the reliability and validity of the NCSC were assessed, and the relationships between NVC, communication ability, and coaching evaluation were examined. Adolescent athletes (N = 276) estimated their coaches' NVC, communication ability, and coaching using the NCSC, Communication Ability Evaluation Scale, and Coaching Evaluation Scale.

Results of structural equation modeling demonstrated the following: (1) reliability and validity of the NCSC used to measure coaches' NVC; (2) relationships between NVC, communication ability, and coaching evaluation; and (3) mediation of communication ability in these relationships. The findings provide a model for relationships between NVC, communication ability, and coaching evaluation.

Keywords: nonverbal communication, communication ability, coaching evaluation

1. Introduction

Coaches' communication significantly influences sports skill development and training quality. Ueta (2004) highlighted the importance of the coach-athlete relationship as follows: "Coach's behavior and attitude elicit athletes change. Change means either play or emotion. Sometimes, there influence for performance." Kikkawa (2005) defined communication ability in sports as "message-sending skill as a sender, and listening skill as a receiver in person to person, person to group, group to group interpersonal communication situations." In addition, there is a need to determine the importance of

both verbal (VC) and nonverbal communication (NVC) in enabling message senders to communicate their purposes effectively. Daibo (2010) defined pathways to communication as "channels," which were categorized as phonetic or nonphonetic. In particular, paraverbal communication, body motion, behavior in space (i.e., proxemics), artifact use, and physical circumstances were defined as NVC channels, as they did not depend on VC. Mehrabian (1981/1986) identified five functions of NVC: emblem: action with the same function as VC; illustrator: action that emphasizes VC content; affect display: emotional expression; regulator: action that initiates and terminates conversation with another

person; and adapter: action that fulfills physical demand.

In research examining coaches' NVC, Endo et al. (2006) examined athletes' experiences of receiving specific NVC messages, perceptions of their volleyball coaches, and impressions of their coaches' NVC. This study found that gestures and touching had a similar function to that of specific VC; in particular, gestures provided positive and corrective messages, and touching provided positive messages. However, there is a paucity of studies examining NVC in coaches of a range of different types of sport. In social psychology studies of NVC, two methodologies were examined by Patterson (1983/1995) using the channel approach: focusing on each channel individually (e.g., interpersonal distance, expression, and gaze) and using a multichannel approach in which integrative capture of NVC allowed a focus on interdependent relationships in actual action. However, NVC research has been limited due to narrow applicability of study findings and gaps between theoretical explanation and the real world (Patterson, 2007). Friedman et al. (1980) referred to two restrictive factors in the study of NVC: ambiguity in the concept of NVC expression and failure to use an existing convenient standardized measurement scale. The Affective Communication Test (ACT: Daibo, 1990a) and Nonverbal Skill Test (Wada, 1992) were specifically designed to assess NVC; however, they focus on the expression and controllability of NVC and do not assess NVC based on actual behavior. Similarly, there is no assessment scale for coaches' NVC.

In contrast, coaching models were constructed in a study examining the improvement and enhancement of coaching ability. Chelladurai (1990) reviewed research involving coaching and constructed a multidimensional model of leadership for coaches. This model explained situations and coaches' personalities, and athlete personality became an antecedent factor in predicting coaches' attitudes, which affected performance and satisfaction in sport participation. Côté et al. (1995) constructed a coaching model based on interviews with Canadian elite gymnastics coaches. The model indicated that the understanding of athletes constructed within coaches' minds affected performance enhancement and achievement of goals in athletes via the coaching process. Similarly, the model showed that the coaching process was affected by the coach's personality,

athlete's personality and developmental stage, and environmental context. The multidimensional model of coaching (Chelladurai, 1990) was the first model of coaches' attitudes. In addition, the coaching model (Côté et al., 1995) facilitated the understanding of coaches' minds and behavior. Vallée and Bloom (2005) posited that these two models provided a fundamental framework via which to study coaching psychology in sport. Regarding a model focusing on the coach-athlete relationship, Martens (1987/1991) constructed the communication process model, which explained the coach-athlete communication process via six processes: the decision to send a message, message encoding by the sender, sending a message to the receiver, the message migration channel, message re-encoding by the receiver, and the internal response of the receiver. In addition, Rhind and Jowett (2010) conducted an interview survey focusing on relationship maintenance in coach-athlete relationships. Findings of this study indicated that conflict management, openness, motivation, positivity, advice, support, and social networks were required to manage relationships, and the construction of a model demonstrated the process of relationship maintenance in coaches and athletes. The Committee of Sports Medicine and Science of the Japan Sports Association began a mental management study in 1985, in which a coaching model was constructed based on psychological research in Japan. Ishii et al. (1994, 1995, 1996) conducted a survey of excellent junior coaches and constructed a model of the philosophical construct of coaching. Further, Kitamura et al. (2005) conducted an interview survey of high school soccer coaches and constructed a mental model to illustrate coaches' situation management and behavioral decision making. However, these studies focused on the philosophical construct of coaching and examined coaching from the coach's perspective using a qualitative approach. Thus far, no quantitative research has been conducted involving the construction of a model focusing on coach-athlete communication.

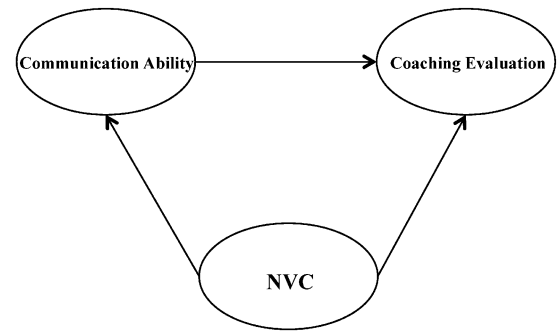
Therefore, in Study 1, a nonverbal communication scale for coaches (NCSC) was constructed and focused on athletes' assessment of coaches' NVC; in addition, the reliability and validity of the scale was determined. Study 2 aimed to further confirm the reliability and validity of the scale and involved the construction of a model focusing on coach-athlete

communication by considering the relationship between communication ability, assessed using the Communication Ability Scale designed by Negishi and Kikkawa (2003), and coaching evaluation, assessed using the Coaching Evaluation Scale designed by Tanaka et al. (1996).

Furthermore, NVC assessment was based on athletes' impressions and perceived frequency of coaches' NVC. Endo (2004) described impression formation in interpersonal communication as follows: "Impressions were formed by analogizing others' traits from their exterior and behavior" and referred to the importance of the message receiver's perception of the message sender's NVC in the formation of impressions of others. In addition, research findings in experimental psychology showed that the frequency of NVC expression affected the formation of impressions of others (Wada and Wakabayashi, 1991). In research examining NVC in coaching, Endo et al. (2006) assessed coaches' NVC during competitions by watching video recordings of the competitions to examine specific message content and the perceived impressions of athletes. Therefore, experimental and cross-sectional studies have focused on perceived impressions and frequency, and their assessment appears to differ from that of previous methods focusing on self-report expression, sensibility, and the controllability of NVC. This study focused on athletes' perceived impressions and frequency of coaches' NVC, and the validity of the measurement tool in defining NVC assessment as perceived frequency of positive or negative NVC was tested.

Further, a model that focused on coach-athlete communication was constructed in Study 2, to test the hypothesis that relationships exist between NVC, communication ability, and coaching evaluation, based on previous research and literature (See Figure 1).

Regarding the relationship between communication ability and coaching evaluation, Horn (2002), Jowett (2003), Jowett and Cockerill (2003), and Myers et al. (2005) found that the state of coach-athlete communication affected athletes' evaluation of coaching. Therefore, a path from communication ability to coaching evaluation was assumed. A path from NVC to communication ability was also assumed based on insights from constructive concepts of communication. Daibo (2010) categorized constructive concepts of communication into VC and



Note: NVC = nonverbal communication

Figure 1. Hypothesis Model of Relationships between NVC, Communication Ability, and Coaching Evaluation

NVC. Similarly, the Communication Ability Scale (Negishi and Kikkawa, 2003) constructed as "Coach read athletes message on large heart: Listening Skill," "Coach communicate their true thought and something to say: Sending Skill" and others, and explained communication ability including VC and NVC. Therefore, a path from coach's NVC to communication ability was assumed.

Regarding the relationship between NVC and coaching evaluation, coaches' NVC is regarded as one of the components of effective coaching and has been found to affect performance in athletes (Martens, 1987/1991; Weinberg and Gould, 1995a). Similarly, Ueta (2004) identified a relationship between coaches' NVC and athletes' performance in actual coaching settings. In social psychology, Berlo (1960/1972) found an effect of the message sender's NVC on the message receiver's interpersonal cognition and attitude. Therefore, we assumed that NVC would affect coaching evaluation independently without the need to mediate communication ability including VC.

2. Study 1

2.1. Purpose

Study 1 aimed to construct an NCSC focusing on athletes' perceived impressions and frequency of coaches' NVC. In addition, the reliability and validity of the scale were tested.

2.2. Methods

2.2.1. Participants

Undergraduate students, graduate school students, and graduates with sports experience participated in the study and were asked to complete a questionnaire concerning their coaches in situations in which they had achieved their highest competition scores. The questionnaire was distributed to 200 participants; 170 questionnaires were returned (85.0% collection rate), 166 of which were complete (97.6% response rate).

2.2.2. Measurement

The questionnaire items were as follows: (1) demographic characteristics (sex, age, sport participation, ages of individuals who had achieved the highest competition scores, highest sports score, and team position); (2) 80 items designed to assess perceived impressions (from 1 [bad] to 5 [good]) and frequency (from 1 [infrequently] to 5 [frequently]) of previous coaches' NVC. The first author extracted 163 items from the NVC index based on previous literature (Christina and Corcos, 1988/1991; Endo et al., 2006; Hakamata et al., 2009; Hall, 1966/1970; Kanayama, 1983; Lynch, 2001/2008; Martens, 1987/1991; Morris, 1977/1980; Nakamura, 1996/2001; Whiteside, 1974/1975). Further, 80 items pertaining to coaches' behavior were adapted to accommodate two graduate school students who had experienced coaching and specialized coaching psychology, one graduate school student who had experienced coaching, one graduate school athlete, and a professor of sports psychology.

In addition, 52 classifications of NVC were selected from the literature (Aikawa and Tsumura, 1996; Araragi and Kojo, 1996; Daibo, 1990b; Daibo and Okuda, 1996; Endo et al., 2006; Hakamata et al., 2009; Ishii, 1998; Kanashiro et al., 2006; Kikkawa, 2005; Martens, 1987/1991; Murata et al., 2008; Nakagawa, 1996; Patterson, 1983/1995; Tokunaga, 2005; Wada, 1996). We identified similar classifications (Table 1) and categorized items into seven categories. Eighty NVC items were categorized during the questionnaire construction. Categorization of NVC also involved consensual decision-making by five researchers. In addition, retrospective methods were adopted, as they enabled reflective assessment of a number of types of NVC in coaches. Participants were asked about NVC in their coaches

Table 1. Classification of NVC in this study.

Classification of coaches NVC
Body Motion (gesture, cross legs, sign, mannerisms, and posture)
Expression
Body Contact (touching)
Line of Sight (eye line, and eye contact)
Accessories and artifacts (apparel, hairstyle, and makeup)
Paraverbal (pace, volume, stronger and weaker, vocal distance)
Interpersonal Distance (distance and position during conversation)

Note: NVC = Nonverbal communication

when they had achieved the highest competition scores.

2.2.3. Procedure

Questionnaires were distributed during university classes and following club training. Participants were assured that all personal information and responses would remain confidential and their information would only be used for study purposes.

2.2.4. Data analysis

Analyses were conducted using SPSS 11.5J for Windows. We performed exploratory factor analysis to assess impressions, using iterative principal axis factoring with promax rotation. To determine the optimal number of factors, we used eigenvalues, cumulative contribution ratios, and interpretability. A factor loading threshold of .400 was used to identify factors, and items with high factor loadings on multiple factors were excluded. Floor and ceiling effects were not considered due to concern regarding the division of negative and positive nonverbal communication factors, and standard normal distribution was not assumed. Reliability was confirmed via Cronbach's alpha. In addition, Pearson's correlation analysis was performed to examine relationships between extracted factors of positive and negative NVC frequency scores.

2.3. Results

2.3.1. Demographic Characteristics

Of 166 participants, 99 were men and 67 were women, 125 were college or university students, 23 were graduate school students, and 18 were postgraduate college or university students. The

numbers of participants who had achieved the highest competition scores in junior high school, high school, college or university, and postgraduate college or university were 33, 67, 49, and 17, respectively. The sports played by participants were volleyball ($n = 38$), basketball ($n = 36$), athletics ($n = 31$), kabaddi ($n = 18$), soccer ($n = 12$), baseball ($n = 10$), judo ($n = 4$), tennis ($n = 4$), soft ball ($n = 4$), cheer leading ($n = 2$), badminton ($n = 1$), cycling ($n = 1$), baton twirling ($n = 1$), kendo ($n = 1$), and field hockey ($n = 1$).

2.3.2. Construction of the NCSC via Factor Analysis

Factor analysis of impression ratings indicated two dimensions and 42 items (See Table 2). The first dimension, “negative NVC” included 20 items reflecting the negative aspects of NVC. The second dimension, “positive NVC” included 22 items reflecting positive behavior. However, these two dimensions contained a number of items. Secondary factor analysis was conducted to explore both negative and positive aspects of NVC (Tables 3 & 4).

This first negative NVC factor reflected athletes’ negative impressions (e.g., “casting a sideways glance toward the athlete”) and was named “unfavorable impression formation.” The second factor reflected unfavorable attitudes to athletes’ views and performance (e.g., sitting with one’s cheek in one’s hand) and was named “negative attitude.” The third factor reflected unacceptable attitudes toward athletes (e.g., sitting with one’s legs crossed) and was named “unacceptable attitude.” The fourth factor reflected expressions of perplexity regarding athletes in distressing situations (e.g., touching one’s neck) and was named “exhibition of perplexity.”

The first positive NVC factor reflected maintenance of a distance preferable to athletes in coach-athlete relationships (e.g., talking at arm’s length) and was named “positive distance.” The second factor included gestures that evoked vigor and positive impressions in athletes (e.g., punching the air in celebration of victory) and was named “positive gesture.” The third factor included touching to evoke positive emotion in athletes (e.g., touching the athlete’s back) and was named “positive touching.” The fourth factor reflected favorable expressions (e.g., smiling) and was named “positive expression.”

Table 2. Factor Loadings for Exploratory Factor Analysis with Promax Rotation of NVC.

Item	Factor loading	
	F1	F2
<i>F1 Negative NVC ($\alpha = .934$)</i>		
Looking down on the athlete	.790	.017
Putting one’s hand behind one’s head	.763	.043
Casting a sideways glance toward the athlete	.762	-.087
Speaking in a soft voice	.749	-.016
Hunching one’s back	.744	-.170
Putting one’s hand in one’s pocket	.738	.024
Stomping one’s feet	.704	.063
Avoiding direct eye contact	.694	-.095
Sitting with one’s legs crossed	.691	.080
Sitting with one’s cheek in one’s hand	.689	-.073
Leaning backward while sitting on a chair	.663	-.014
Touching one’s neck	.662	.093
Covering one’s mouth with one’s hand	.654	.108
Talk to athlete with a stiff tone	.631	.026
Remaining silent	.597	-.098
Narrowing one’s eyes	.596	-.049
Spreading one’s legs while sitting on a chair	.549	.038
Furrowing one’s brow	.547	.113
Never changing one’s facial expression	.436	-.056
Spreading one’s hands while raising one’s palms upward	.431	.256
<i>F2 Positive NVC ($\alpha = .917$)</i>		
Touching the athlete’s hand	.005	.742
Touching the athlete’s shoulder	-.082	.719
Touching the athlete’s back	-.087	.659
Touching the athlete’s head	-.016	.657
Speaking with clear pronunciation	-.033	.655
Always smiling	-.074	.641
Talking to the athlete face to face	.122	.601
Punching the air in celebration of victory	-.092	.592
Shaking hands	-.177	.590
Explaining using gestures	-.008	.585
Talking while looking in the same direction as the athlete	.021	.572
Smiling	.036	.563
Looking into the athlete’s eyes while talking	.092	.553
Nodding one’s head	.008	.537
Leaning forward to listen	.127	.535
Talking within arm’s reach of the athlete	.081	.526
Leaning forward to explain	-.019	.526
Clapping one’s hands	-.092	.520
Laughing out loud	.080	.498
Talking within contact distance of the athlete	.167	.494
Serving as a model of skill	-.031	.485
Speaking in a loud voice	.078	.463

Correlation: $r = .022$ ($p < .01$)

Note: NVC = Nonverbal communication

2.3.3. Reliability and Validity of the NCSC

Acceptable Cronbach’s alpha coefficients (.718–.934) were confirmed for each factor. Content validity was confirmed via correspondence between four research collaborators. All members agreed

Table 3. Factor Analysis of Negative NVC.

Item	Factor loading			
	<i>F1</i>	<i>F2</i>	<i>F3</i>	<i>F4</i>
<i>F1</i> Unfavorable Impression Formation ($\alpha = .886$)				
Casting a sideways glance toward the athlete	.822	-.067	.209	-.123
Avoiding direct eye contact	.817	-.058	.043	-.003
Never changing one's facial expression	.700	-.179	-.145	.134
Remaining silent	.649	.206	-.189	.016
Speaking in a soft voice	.571	.154	-.018	.128
Looking down on the athlete	.527	.276	.134	-.065
Narrowing one's eyes	.465	-.109	.383	-.063
Talking to the athlete using a stiff tone of voice	.463	.099	.034	.114
<i>F2</i> Negative Attitude ($\alpha = .803$)				
Sitting with one's cheek in one's hand	.059	.943	-.154	-.062
Leaning backward while sitting on a chair	-.044	.728	.139	-.066
Stomping one's feet	-.057	.674	.119	.086
Spreading one's legs while sitting on a chair	-.068	.638	.052	.022
<i>F3</i> Unacceptable Attitude ($\alpha = .851$)				
Sitting with one's legs crossed	-.126	-.021	.844	.110
Putting one's hand in one's pocket	-.129	.198	.738	.038
Putting one's hand behind one's head	.021	.145	.639	.089
Furrowing one's brow	.192	-.116	.540	.012
Hunching one's back	.274	.160	.448	-.049
<i>F4</i> Exhibition of Perplexity ($\alpha = .718$)				
Touching one's neck	.111	-.011	.000	.768
Covering one's mouth with one's hand	.029	.172	.022	.634
Spreading one's hands while raising one's palms upward	.001	-.134	.178	.482
Correlation				
	<i>F1</i>	<i>F2</i>	<i>F3</i>	<i>F4</i>
	<i>F2</i>			
	<i>F3</i>			

Note: NVC = Nonverbal communication

* $p < .05$, ** $p < .01$

that the items and factors reflected coaches' actual NVC. Therefore, content validity was confirmed (Murakami, 2006).

2.3.4. Relationship between Frequencies of Each NVC factors

Relationships between factors were determined by multiplying factor scores by frequency scores. A number of subfactors for positive and negative NVC were negatively correlated, and some were not correlated. However, the subfactors for negative NVC were significantly positively correlated. Similarly, the subfactors for positive NVC were significantly positively correlated (Table 5).

3. Study 2

3.1. Purpose

Study 2 aimed to confirm further reliability and validity of the NCSC constructed in Study 1 and the validity of a measurement approach using frequency scores. In addition, we tested the validity of hypothesis model of relationships between NVC, communication ability, and coaching evaluation via confirmation of the relationships demonstrated via the NCSC, Communication Ability Scale (Negishi and Kikkawa, 2003), and Coaching Evaluation Scale (Tanaka et al., 1996).

Table 4. Factor Analysis of Positive NVC.

Item	Factor loading			
	<i>F1</i>	<i>F2</i>	<i>F3</i>	<i>F4</i>
<i>F1</i> Positive Distance ($\alpha = .819$)				
Talking within arm's reach of the athlete	.818	-.024	.045	-.119
Talking within contact distance of the athlete	.761	-.093	.100	-.064
Talking while looking in the same direction as the athlete	.614	-.159	.234	.117
Talking to the athlete face to face	.554	.292	-.083	.004
Looking into the athlete's eyes while talking	.510	.149	.022	.084
Speaking in a loud voice	.474	.047	-.111	.241
<i>F2</i> Positive Gesture ($\alpha = .832$)				
Punching the air in celebration of victory	-.350	.726	.246	.060
Explaining using gestures	.187	.700	-.125	-.088
Leaning forward to explain	.162	.664	-.101	-.085
Serving as a model of skill	.027	.584	.041	-.088
Clapping one's hands	-.179	.563	.134	.099
Nodding one's head	.061	.541	-.088	.166
Leaning forward to listen	.035	.492	.167	-.054
Speaking with clear pronunciation	.287	.410	-.001	.106
<i>F3</i> Positive Touching ($\alpha = .888$)				
Touching the athlete's back	.001	.044	.908	-.123
Touching the athlete's shoulder	.088	.001	.891	-.068
Touching the athlete's head	.081	-.033	.726	.065
Touching the athlete's hand	.269	.087	.561	.016
Shaking hands	-.068	.031	.546	.259
<i>F4</i> Positive Expression ($\alpha = .816$)				
Smiling	.016	-.059	-.039	.872
Always smiling	.097	-.006	-.039	.785
Laughing out loud	-.068	.018	.081	.658
Correlation	<i>F1</i>	<i>F2</i>	<i>F3</i>	<i>F4</i>
	<i>F1</i>	.534**	.501**	.400**
	<i>F2</i>		.640**	.606**
	<i>F3</i>			.530**

Note: NVC = Nonverbal communication

** $p < .01$

Table 5. Results of Correlation Analysis According to NCSC Frequency Scores (Study 1).

Variables	N1	N2	N3	N4	N5	P1	P2	P3	P4	P5
N1 Negative NVC		.746**	.721**	.847**	.409**	-.186*	-.183	-.136	-.170*	-.206**
N2 Unfavorable Impression Formation			.265**	.436**	.230**	-.236**	-.239**	-.170*	-.155*	-.254**
N3 Negative Attitude				.660**	.141	-.120	-.113	-.045	-.208**	-.142
N4 Unacceptable Attitude					.190*	-.209**	-.083	-.198*	-.217**	-.242**
N5 Exhibition of Perplexity						.265**	.039	.224**	.281**	.269**
P1 Positive NVC							.708**	.894**	.859**	.740**
P2 Positive Distance								.542**	.509**	.409**
P3 Positive Gesture									.646**	.615**
P4 Positive Touching										.543**
P5 Positive Expression										

Note: NVC = Nonverbal communication; NCSC = Nonverbal communication scale for coaches

* $p < .05$, ** $p < .01$

3.2. Methods

3.2.1. Participants

High school and undergraduate and postgraduate college or university students engaging in competitive sport participated in Study 2. There were 15 teams (including 10 sports: volleyball, basketball, athletic specialized jumping, soft ball, soccer, athletic specialized long distance running, kabaddi, gymnastics, athletic specialized throwing, field hockey, and kendo) in the study. Questionnaires were distributed to 292 athletes, and 291 were returned (collection rate = 99.7%). Questionnaires containing responses from team staff or managers or missing data were excluded, leaving 276 valid responses (response rate = 94.8%).

3.2.2. Measurement

Questionnaire content included the following: (1) demographic characteristics (sex, age, sport, highest sports score, team position, and coach's sex); (2) the NCSC constructed in Study 1 to examine perceived impressions and frequency of coaches' NVC; (3) the Communication Ability Scale (Negishi and Kikkawa, 2003) including 2 factors and 16 items with responses provided via a 5-point scale (from 1 [disagree] to 5 [agree]); and (4) the Coaching Evaluation Scale (Tanaka et al., 1996) including 5 factors and 40 items with responses provided on a 5-point scale (from 1 [disagree] to 5 [agree]).

The Communication Ability Scale (Negishi and Kikkawa, 2003) focuses on coaches' ability to send and receive messages. The scale could be regarded as inclusive of NVC and VC ability assessment. Similarly, the scale was constructed using two factors, listening skills and sending skills, with 8 items for each factor. Reliability was confirmed via Cronbach's alpha. Criterion-related validity was also confirmed via correlation with Social Skill Inventory (Kiss-18; Kikuchi, 2004) items.

The Coaching Evaluation Scale (Tanaka et al., 1996) was used to assess athletes' evaluations of coaching. The scale includes five factors, motivator (enhancement of athlete's motivation), organizer (construction and administration of the team), instructor (instruction in sport skills), character (positive personality), and educator (educational ability), with 8 items for each factor. Reliability was tested using Cronbach's alpha. In addition, Akaba et al. (1998) and Takano et al. (1998) reported a relation-

ship between Coaching Evaluation Scale and Taikyo Sports Motivation Inventory items. Therefore, we regarded this scale as having high construct validity.

3.2.3. Procedure

Questionnaires were distributed following club training. Participants were assured that all personal information and responses would remain confidential and their information would be used only for the study.

3.2.4. Data Analysis

Analyses were conducted using SPSS 11.5 J for Windows and SPSS Amos 17.0. The reliability of the NCSC was assessed via Cronbach's alpha, confirmatory factor analysis (CFA), and Pearson's correlation using frequency scores for each factor. The validity of the measurement approach and the hypothesis model were assessed via structural equation modeling (SEM). Model fit was evaluated via the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the comparative fit index (CFI), and root mean square error approximation (RMSEA). In addition, Murohashi (2007) recommended considering model fit and interpretability in model adoption. Therefore, the interpretability of the constructed model was considered.

3.3. Results

3.3.1. Demographic characteristics

Of 276 participants, 168, 108, 119, 141, and 16 were men, women, high school students, undergraduate college or university students, and postgraduate college or university students, respectively. The factors of participants' highest sport competition achievements were as follows: participation in city conventions ($n = 7$), prefecture conventions ($n = 90$), regional conventions ($n = 36$; e.g., Kanto area), national conventions ($n = 112$), and international conventions ($n = 19$); there were also 12 incomplete responses.

3.3.2. Reliability, Validity, and Applicability of an Ongoing Coach and Athlete NCSC

Internal consistency was assessed via Cronbach's alpha. Negative ($\alpha = .906$), and positive ($\alpha = .906$) NVC were the main factors. In addition, internal consistency was confirmed for the unfavorable impression formation ($\alpha = .834$), negative attitude

Table 6. Results of Correlation Analysis According to NCSC Frequency Scores (Study 2).

Variables	N1	N2	N3	N4	N5	P1	P2	P3	P4	P5
N1 Negative NVC		.798**	.730**	.830**	.733**	-.066	-.131*	-.093	.079	-.109
N2 Unfavorable Impression Formation			.361**	.472**	.438**	-.222**	-.265**	-.207**	-.050	-.238**
N3 Negative Attitude				.569**	.461**	.039	.013	-.009	.075	.054
N4 Unacceptable Attitude					.554**	-.065	-.102	-.095	.050	-.086
N5 Exhibition of Perplexity						.192**	.077	.145*	.284**	.047
P1 Positive NVC							.803**	.862**	.801**	.711**
P2 Positive Distance								.598**	.482**	.534**
P3 Positive Gesture									.546**	.522**
P4 Positive Touching										.418**
P5 Positive Expression										

Note: NVC = Nonverbal communication; NCSC = Nonverbal communication scale for coaches

* $p < .05$, ** $p < .01$

($\alpha = .711$), unacceptable attitude ($\alpha = .818$), exhibition of perplexity ($\alpha = .654$), positive distance ($\alpha = .737$), positive gesture ($\alpha = .782$), positive touching ($\alpha = .896$), and positive expression ($\alpha = .734$) subfactors.

Further, the applicability of the NCSC for use with coaches and athletes engaging in competitive sport was confirmed. An NCSC was constructed using retrospective methods in Study 1. The constructive concepts and relationships between factors pertaining to coaches and athletes engaging in competitive sport were assessed using CFA and correlation analysis. Results of CFA showed that the model fit well (GFI = .945, AGFI = .896, CFI = .950, and RMSEA = .093).

As in Study 1, correlation coefficients between negative and positive NVC factors were calculated, and some factors were significantly negatively correlated and some were not correlated. Negative NVC factors were independently moderately or strongly positively correlated, as were positive NVC factors (Table 6).

Study 2 indicated the same factor structure and a similar tendency in correlation coefficients. Therefore, the stability of the NCSC was preserved. In addition, the same factor structure has been confirmed in another sample (Murakami, 2006); therefore, generalization was also confirmed.

3.3.3. Validity of NVC assessment according to athletes' perceived frequency of coaches' NVC

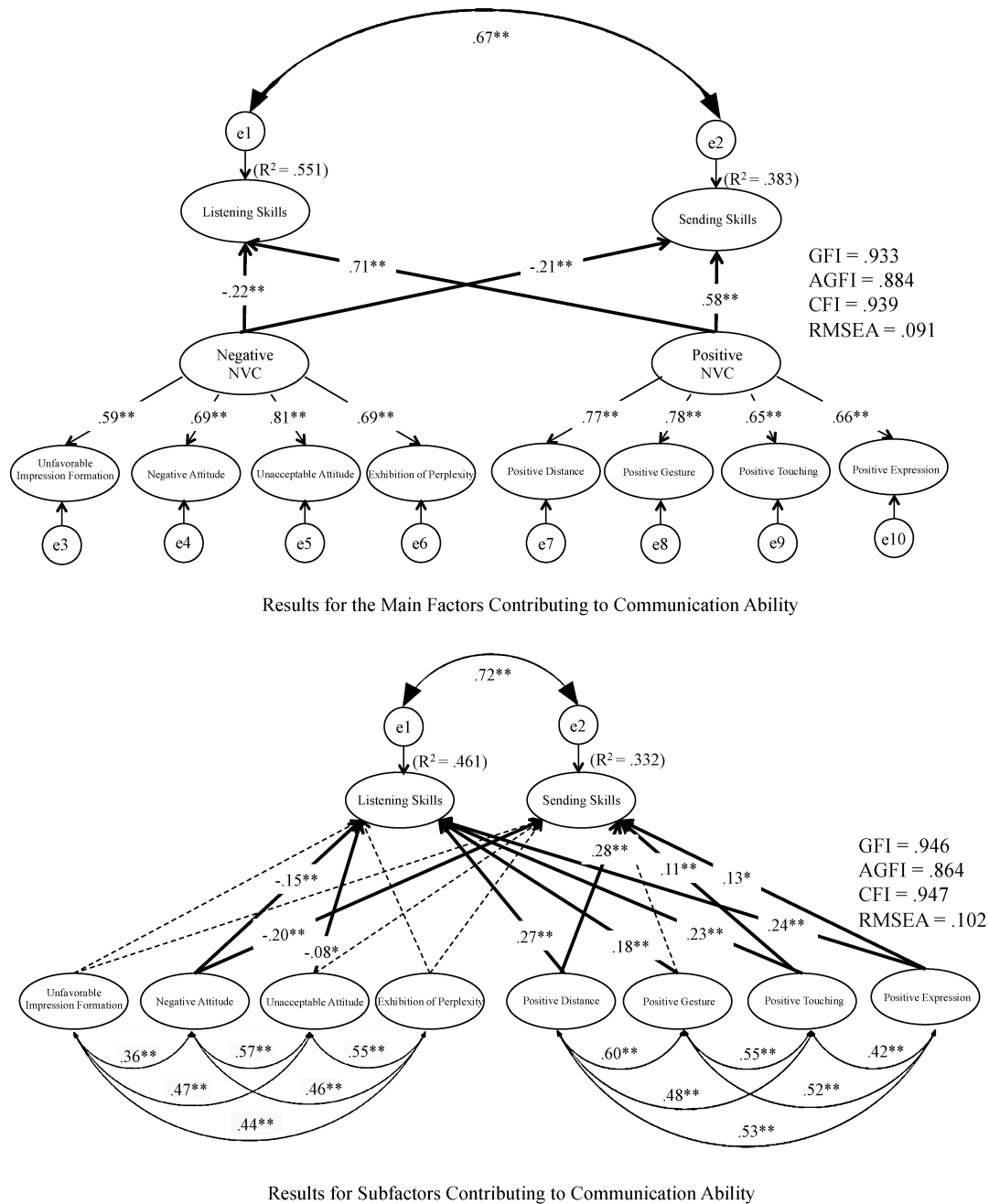
A previous study assessing NVC via questionnaire focused on expression, sensitivity, and controllability, using self-assessment. Thus far, no scales have been constructed to assess NVC in others. It

was difficult to confirm the validity of NVC assessment via correlation with similar scales; therefore, it was tested using model adequacy in this study (Murakami, 2006). This study tested the relationships between NVC, communication ability including VC and NVC (Negishi and Kikkawa, 2003), and coaching evaluation (Tanaka et al., 1996) in coaching situations for confirming the validity of the measurement method. Model construction was confirmed using the hierarchical model, negative and positive NVC, and each subfactor identified.

3.3.4. Relationship between communication ability and the NCSC

SEM was performed to examine the relationship between NVC assessment and listening and sending skills in communication ability. Daibo (2008) and Fujimoto and Daibo (2007) posited that concepts of communication ability included VC and NVC. Therefore, communication ability could not be explained by NVC alone. Covariation was established between errors in listening and sending skills, based on Oshio (2008).

Results of the statistical analysis are shown in Figure 2. In the hierarchical model of negative and positive NVC, listening skill and sending skill were significantly influenced by negative (-.22 and -.21 respectively) and positive (.71 and .58 respectively) NVC. Similarly, the subfactor model also confirmed that NVC exerted a significant influence on communication ability. The fit of the hierarchical model was good. In the subfactor model, AGFI and RMSEA results were slightly low. However, we considered this to be within the acceptable range due to confirmed good fit in the hierarchical model, shown



Note: NVC = nonverbal communication; all paths are standardized estimates; dashed lines represent nonsignificant paths
 $*p < .05$, $**p < .01$

Figure 2. Relationship between NVC and Communication Ability

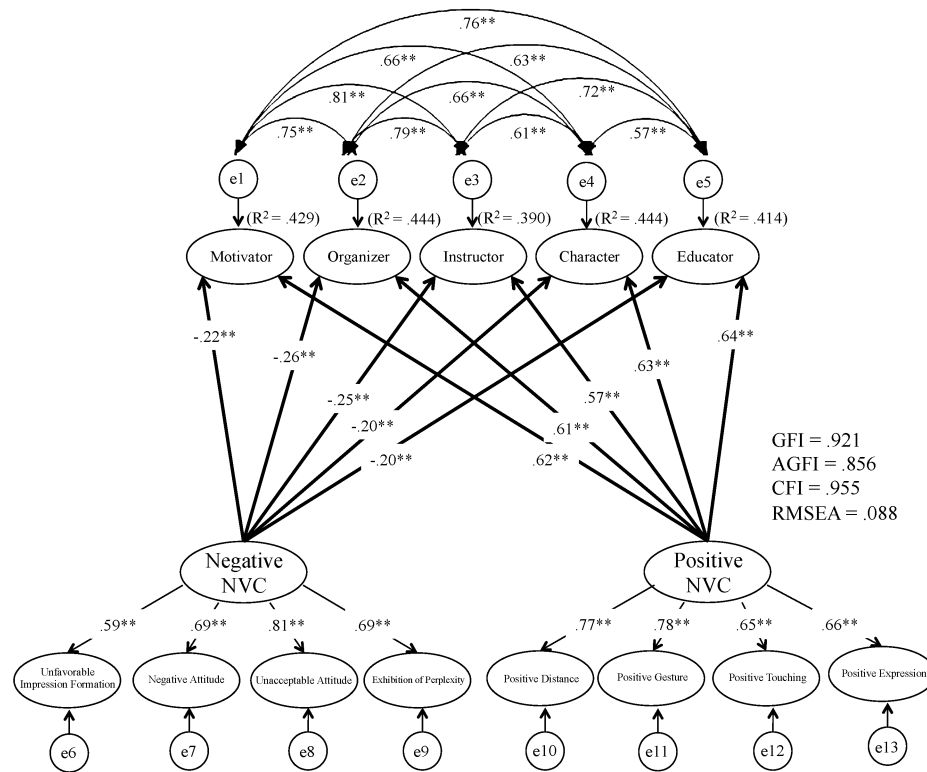
via the GFI and CFI.

3.3.5. Relationship between coaching ability and the NCSC

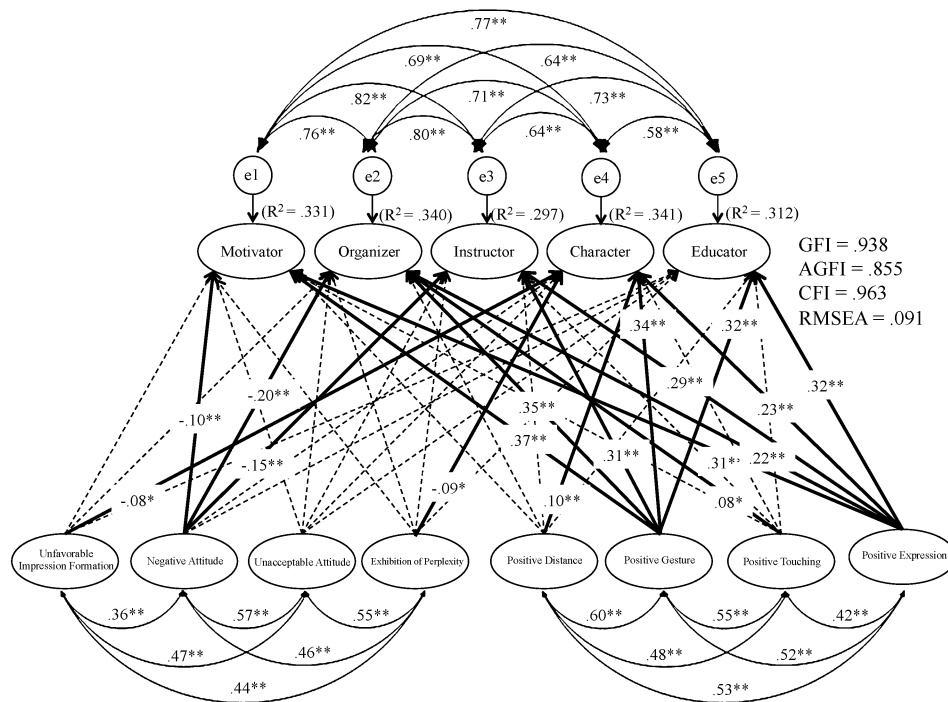
SEM was performed to confirm the influence of NVC assessment on the coaching ability factors (motivator, organizer, instructor, character, and educator). Sabock (1991) highlighted the importance of various abilities including communication skills

in successful coaching. Therefore, covariation was established via errors in coaching evaluation factors, based on Oshio (2008).

Results of the statistical analysis are shown in Figure 3. In the hierarchical model of negative and positive NVC, all five factors were significantly affected by both negative and positive NVC; the path coefficients were as follows: motivator: $-.22$ and $.62$; organizer: $-.26$ and $.61$; instructor: $-.25$



Results for the Main Factors Contributing to Coaching Evaluation



Results for Subfactors Contributing to Coaching Evaluation

Note: NVC = nonverbal communication; all paths are standardized estimates; Dashed lines represent nonsignificant paths
 $*p < .05$, $**p < .01$

Figure 3. Relationship between NVC and Coaching Evaluation

and .57; character: -.20 and .63; and educator -.20 and .64, respectively. In the subfactor model, NVC significantly influenced communication ability.

Model fit was good in both the hierarchical and subfactor models.

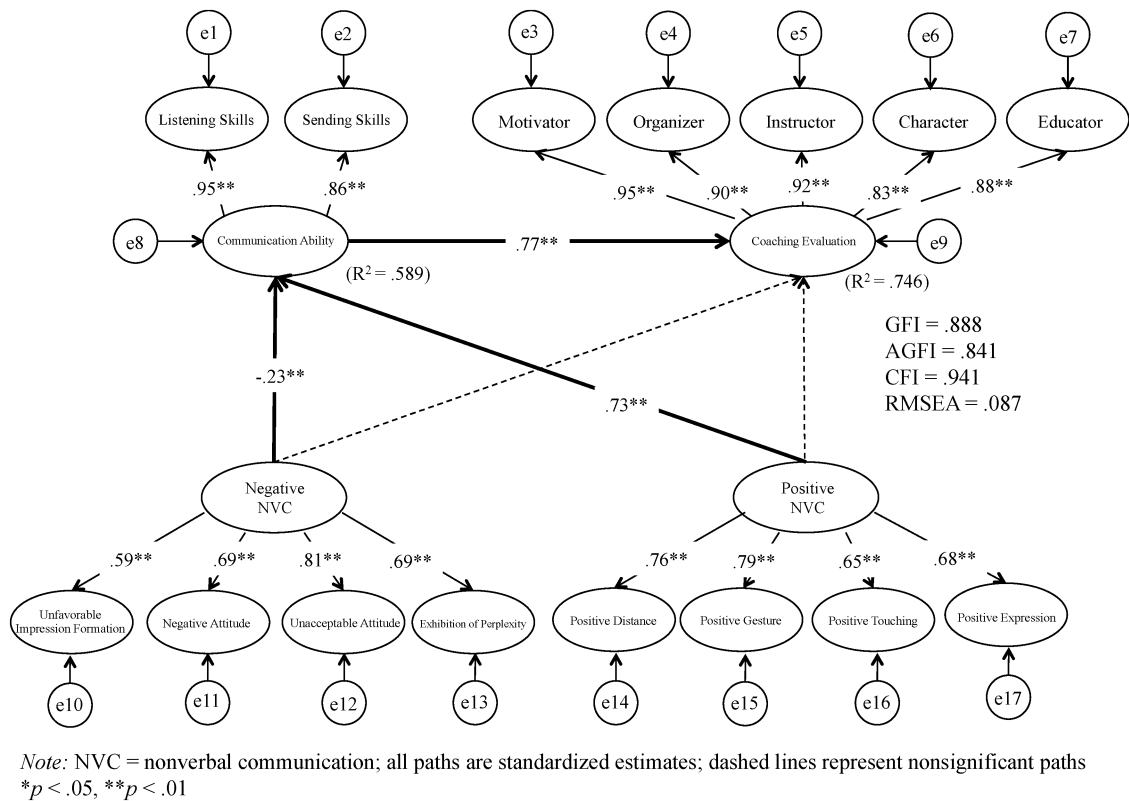


Figure 4. Relationships between NVC, Communication Ability, and Coaching Evaluation

3.3.6. Relationships between the NCSC, communication ability, and coaching evaluation

The results indicated that athletes' perceived frequency of coaches' NVC influenced communication ability, and coaching evaluation through confirming the validity of the measurement method, based on athletes' perceived frequency of coaches' NVC. Therefore, we concluded that athletes' perceived frequency of NVC could be used to assess coaches' NVC. Based on previous research and literature, the hypothesis model was tested to examine the relationships between the NCSC, communication ability, and coaching evaluation (see Figure 1). In addition, covariation between negative and positive NVC was not assumed, as these factors were structured independently based on EFA, using impression scoring. Moreover, no relationships between factors were observed in the correlation analysis.

Figure 4 shows the results of SEM. Significant paths were demonstrated from negative (-.23) and positive (.73) NVC to communication ability. A path was also demonstrated from communication ability to coaching evaluation (.77). Significant paths from NVC assessment to coaching evaluation were erased. Furthermore, a mediator effect (Baron

and Kenny, 1986) of communication ability was demonstrated. The GFI and AGFI did not fulfill the adoption criteria. However, Komatsu (2007) found that the GFI and AGFI calculations were low in a constructed model including over 30 variables. Because the model included 36 variables, good fit was confirmed via CFI and RMSEA, and significant path coefficients were demonstrated, we adopted the model.

4. Discussion

4.1. Construction of the NCSC based on perceptions of coaches' NVC

Negative and positive NVC factors and their sub-factors were obtained via EFA in Study 1. These findings indicated that coaches' NVC explained a hierarchical model that included broader concepts of positive and negative NVC and narrower concepts of unfavorable impression formation, negative attitude, unacceptable attitude, exhibition of perplexity, positive distance, positive gesture, positive touching, and positive expression. Likewise, results of the subfactor analysis showed that negative NVC

reflected negative expression in coaches. Therefore, these factors reflected negative emotion and intention in athletes. In contrast, positive NVC demonstrated consistent positive impressions with respect to each channel (e.g., interpersonal distance, body contact, body motion, and expression). Constructive concepts of the NCSC were consistent with those observed in an experimental study examining healthy individuals (Daibo, 1990b) and comprehensive knowledge in Wada's (1996) review article.

Extracted NCSC items comprised "stomping one's feet" and "serving as a model of skill" differ from a study involving volleyball coaches (Endo et al., 2006). Few studies have examined coaches' NVC directly; however, it has been characterized in most types of sport, and the type and frequency of NVC found in volleyball coaches appeared to differ from that observed in coaches of contact sports (e.g., soccer and basketball) or sports involving minimal communication during play (e.g., athletic sports and swimming). Use of the NCSC could facilitate the identification of differences in coaches' NVC according to the type of sport involved.

Results of the reliability and validity analysis demonstrated stability and the reliability of internal consistency via Cronbach's alpha, CFA, and correlation analysis. Validity was tested via generalizability, appropriateness of content, factor analysis, and compatibility of the model from Murakami's (2006) requisite. Therefore, we concluded that the reliability and validity of the NCSC were confirmed. The validity of the measurement method was demonstrated based on athletes' perceived frequency of coaches' NVC. The results also demonstrated the relationships between the NCSC, communication ability, and coaching evaluation. This finding was consistent with previous results revealing the frequency of NVC according to the effect of the message sender's impression formation on the message receiver (Wada and Wakabayashi, 1991). The findings suggested that the NCSC could be used to assess the frequency of NVC leading to good or bad impressions and differs from existing scales assessing exhibition, sensitivity, and controllability (Daibo, 1990a; Wada, 1992). The results contribute to resolving the issues involved in the study of NVC noted by Friedman et al. (1980). Further studies are required to examine the predictive capability of observation methods involving video recordings in identifying the relationship between NCSC scores

and actual behavior (Endo et al., 2006). In addition, conducting intervention studies to confirm relationships between increases in positive NVC, decreases in negative NVC, and athletes' motivation and performance contribute to the confirmation of further validity.

4.2. Consistency of Coaches' NVC

Results of correlation analysis of the relationships between factors of athletes' perceived frequency of coaches' NVC showed that coaches' positive and negative NVC were coherent within the individual (i.e., coaches who expressed negative NVC expressed various types of negative NVC, while those who expressed positive NVC expressed various types of positive NVC). This finding suggested a relationship between NVC and leadership style. Weinberg and Gould (1995b) posited that leadership style was reflected in personality and knowledge and consistent within the individual. Further, confirmation of the relationships between coaches' leadership style, leadership behavior, and NVC using the Leadership Scale for Sports (Chelladurai and Saleh, 1980) would constitute important research.

4.3. Relationships between negative and positive NVC subscales, communication ability, and coaching evaluation

This study loaded negative and positive NVC subfactors during scale construction. Results of the analysis of the relationships between NCSC subfactors, communication ability, and coaching evaluation showed that the paths indicated consistent negative effects of negative attitude and positive effects of positive distance, gesture, and expression on communication ability factors. In addition, consistent significant positive effects of positive gesture and expression on coaching evaluation were also observed.

These findings indicated that positive NVC showed more consistent positive effects on communication ability and coaching evaluation relative to negative NVC. Wada (1992) posited that decoding NVC depended on the message receiver's sensitivity to NVC, which may be the reason that negative NVC did not exert this influence. One study reported that information regarding disadvantages experienced by the message receiver was not perceived differently in the general population's inter-

personal communication (Kawanishi, 2000). Rejection of the perception or cognition of negative NVC largely depends on the individual's sensitivity to NVC; therefore, inconsistent influence appears to be comparable to positive NVC.

4.4. Relationships between NVC assessment, communication ability, and coaching evaluation

The purpose of this study was to confirm the relationships between NVC assessment, communication ability, and coaching evaluation and construct a model to contribute to coaching improvement. The results of the hypothesis model assessment revealed that NVC assessment strongly affected coaching evaluation via mediation of communication ability including NVC and VC.

Baron and Kenny (1986) posited that tertiary variables became occurrence mechanisms affecting independent variables and defined dependent variables as mediators. Under mediation circumstances, the influences of independent variables on mediators (path a) and mediators on dependent variables (path b) were significant. The influence of independent variables on dependent variables (path c) showed that significant influence was lost when mediator effects were reported. The results of the present study suggested that the interaction between Coaches' VC and NVC predicted message sending and receiving skill, which significantly affected coaching evaluation.

These findings demonstrated that the interaction between NVC and VC affected coaching evaluation in coaching situations. However, the interaction process is unclear. Therefore, further studies are required to consider the interactive relationship between NVC and VC and the comparative degree of the contribution of NVC and VC to coaching. The double bind communication theory focuses on NVC and VC interaction (Bateson et al., 1956). Hiraki (1981) defined double bind communication as "message receiver could not act satisfactorily by providing conflicting message from sender" and posited that harmful effects of double bind communication in family settings generated inconsistency in the meaning of NVC and VC provided by the message sender. In coaching situations, it appears that athletes' impressions and performance differ according to whether advice is positive or negative and the message sender looks into the athlete's eyes

while talking. In addition, perceived impressions appeared to differ according to the context of the interaction process (i.e., whether NVC or VC was perceived first). Double bind communication was also referred pathology of communication, and noted risk of inhibition to ego-strength and interpersonal relationships. However, similar effects in sports situations including victory or defeat, education, and situational context were not confirmed. Communication studies have focused on comparative degrees of contribution; Mehrabian (1968) defined VC as conversational content and compared the effects of NVC and VC on impression formation. The study showed that NVC showed a higher degree of contribution to impression formation relative to VC. However, thus far, no studies have examined comparative degrees of communication in NVC and VC in coaching.

Based on the above findings, confirming comparative degrees of communication in coaches' NVC and VC is important in the identification of effective communication strategies. This study revealed constructive concepts of coaches' NVC and constructed an NCSC. However, constructive concepts of coaches' VC and an evaluation scale for VC were not considered. Therefore, further studies should consider constructive concepts of VC, construct a measurement scale for VC, and examine the interaction between NVC and VC. In addition, effective communication strategies for coaches and athletes are required.

5. Summary

The purpose of this study was to construct an NCSC and consider the relationships between NVC assessment, communication ability, and coaching evaluation. Study 1 aimed to construct an NCSC using EFA, and Study 2 aimed to confirm the reliability and validity of the NCSC, validity of the measurement method, and relationships between NVC assessment, communication ability, and coaching evaluation. In Study 1, an NCSC composed of 8 negative (unfavorable impression formation, negative attitude, unacceptable attitude, and exhibition of perplexity) and positive NVC subfactors (positive distance, positive gesture, positive touching, and positive expression) was constructed. Study 2 demonstrated the reliability and validity of NCSC; validity of NVC assessment using athlete's perceived

frequency; relationships between NVC assessment, coaching ability, and coaching evaluation; and the mediator effect of communication ability in these relationships. Further studies are required to examine the reliability and validity of the NCSC and the interaction between NVC and VC.

Acknowledgement

We appreciate to Masaaki Kubo, Yoichi Kozuma (Tokai University), and Koji Takenaka (Waseda University) for their contribution to the progress of this study. Also, The first author is deeply grateful to professor Masao Kikkawa (co-author) for continuous contribution on this research question. Without his encouragement, this research would not have materialized. Congratulations on retirement in the current year. I have enjoyed working with you.

References

- Aikawa, A. and Tsumura, T. (1996). Taijin koudougaku kenkyuu series 1: Shakaiteki skill to taijin kankei: Jikohyogen o enjo suru [Interpersonal behavioral study series 1: Social skill and interpersonal communication. Helping self-expression]. Tokyo: Seishin Shobo. (in Japanese)
- Akaba, A., Takano, S., Ueta, Y., Shibuya, S., Tanaka, Y., and Ishida, M. (1998). A study on sport motivation and coaching evaluation: The case of individual sports and team sports. *Bull. Fac. Phys. Educ., Tokai Univ.*, 28: 39-46. (in Japanese)
- Araragi, C. and Kojo, K. (1996). Taijin koudougaku kenkyuu series 2: Kyoushi to kyouiku shudan no shinri [Interpersonal behavioral study series 2: Psychological aspects on teacher and educational groups]. Tokyo: Seishin Shobo. (in Japanese)
- Baron, R. M. and Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.*, 51: 1173-1182.
- Bateson, G., Jackson, D. D., Haley, J., and Weakland, J. (1956). Toward a theory of schizophrenia. *Behav. Sci.*, 1: 251-264.
- Berlo, D. K. (1972). Communication process: Shakai koudou no kiso riron (T. Furu & Y. Akutsu Trans.). Tokyo: Kyoudou Shuppan. (Original work "The process of communication: An introduction to theory and practice" published 1960)
- Chelladurai, P. (1990). Leadership in sports: A review. *Int. J. Sport Psychol.*, 21: 328-354.
- Chelladurai, P. and Saleh, S. D. (1980). Dimensions of leader behavior in sports: Development of a leadership scale. *J. Sport Psychol.*, 2: 34-45.
- Christina, R. W. and Corcos, D. M. (1991). Coaching manual: Sports gijutsu no shidou (H. Toyoda & R. Tonoue Trans.). Tokyo: Taishukan Shoten. (Original work "Coaches guide to teaching sport skills" published 1988)
- Côté, J., Salmela, J. H., Trudel, P., Baria, A., and Russell, S. J. (1995). The coaching model: A grounded assessment of expert gymnastic coaches' knowledge. *J. Sport Exerc. Psychol.*, 17: 1-17.
- Daibo, I. (1990a). Higengoteki hyoushutsusei no sokutei: ACT shakudo no kousei: Nishakan no gengoteki, higengoteki communication ni kansuru multi channel teki kenkyu [Measurement of nonverbal expression: Construct ACT scale: Multi channel study of verbal and nonverbal communication between two persons]. In Monbu sho kagaku kenkyuuhi hojokin kenkyuu seika houkokusho: Ippan kenkyuu (C) [Showa 63, heisei 1 research results report of grants in aid for scientific research (Scientific research C)] (pp. 30-35). (in Japanese)
- Daibo, I. (1990b). Expression of intimacy in interpersonal relationships: Development and dissolution of relationships in communication. *J. Psychol. Rev.*, 33: 322-352. (in Japanese)
- Daibo, I. (2008). Hierarchical conception of social skills. *Taijin Shakai Shinrigaku Kenkyu [Japanese Journal of Interpersonal and Social Psychology]*, 8: 1-6. (in Japanese)
- Daibo, I. (2010). Taijin communication to sports [Interpersonal communication and sports]. *J. Health. Phys. Educ. Recreat.*, 60: 598-602. (in Japanese)
- Daibo, I. and Okuda, H. (1996). Taijin koudougaku kenkyuu series 3: Shinmitsu na taijin kankei no kagaku [Interpersonal behavioral study series 3: Science of close interpersonal relationships]. Tokyo: Seishin Shobo. (in Japanese)
- Endo, T., Mitsui, I., Yasuda, M., and Hoshiyama, K. (2006). A study on nonverbal communication of volleyball coaching. *Bull. Fac. Educ. Hum. Sci., Univ. Yamanashi.*, 8: 72-82. (in Japanese)
- Endo, Y. (2004). Shakaiteki ninchi [Social cognition]. In T. Muto, T. Mori, Y. Endo, & K. Tamase (eds.), *Psychology* (pp. 301-322). Tokyo: Yuhikaku. (in Japanese)
- Friedman, H. S., Prince, L. M., Riggio, R. E., and Di Matteo, M. R. (1980). Understanding and assessing nonverbal expressiveness: The affective communication test. *J. Pers. Soc. Psychol.*, 39: 333-351.
- Fujimoto, M. and Daibo, I. (2007). ENDCORE: A hierarchical structure theory of communication skills. *Jpn. J. Pers.*, 15: 347-361. (in Japanese)
- Hakamata, A., Endo, T., Yasuda, M., Shimokawa, K., Fuse, H., and Ito, J. (2009). A study of touching in volleyball game. *J. Volleyball Sci.*, 11: 19-24. (in Japanese)
- Hall, E. T. (1970). *Kakureta jigen* (T. Hidaka & N. Sato Trans.). Tokyo: Misuzu Shobo. (Original work "The hidden dimension" published 1966)
- Hiraki, N. (1981). Kazoku ryoho [Family therapy]. In H. Umezumi, M. Sagara, O. Miyagi, and A. Yoda (Supervising eds.), *Shinrigaku jiten [Heibonshas psychological dictionary]* (p. 98). Tokyo: Heibonsha. (in Japanese)
- Horn, T. S. (2002). Coaching effectiveness in the sport domain. In T. S. Horn (ed.), *Advances in sport psychology*, 2nd Ed. (pp. 309-354). Champaign: Human Kinetics.
- Ishii, M. (1998). Q33 coach to senshu no communication de ryui subeki koto wa nandesuka [What should be noted in coach-athlete communication?]. In Japanese Society of Sports Psychology (ed.), *Coaching no shinri Q&A [Questions & answers of coaching psychology]* (pp. 78-79). Tokyo: Fumaido Shuppan. (in Japanese)
- Ishii, M., Ishikawa, K., Takami, K., and Goto, H. (1994). Junior ki ni okeru yushushidousha no jittai ni kansuru chousa kenkyu [Fact finding survey of junior stage coaches]. Heisei 5 nendo nihon olymic iinkai sports ikagaku kenkyuu houkoku: No. 3 Junior ki no mental management ni kansuru kenkyuu: Dai 1 pou [1993 Research Results Report of the Japanese Olympic Committee on Sports Medicine and Science: No. 3 Mental Management Study in Junior Stage Athletes: First Report]: 10-40. (in Japanese)
- Ishii, M., Ishikawa, K., Takami, K., and Goto, H. (1995).

- Junior ki ni okeru yushushidousha no jittaichousa ni kansuru chousa kenkyu [Fact finding survey of junior stage coaches]. Heisei 6 nendo nihon olymic iinkai sports ikagaku kenkyuu houkoku: No. 3 Junior ki no mental management ni kansuru kenkyuu: Dai 2 hou [1994 Research Results Report of the Japanese Olympic Committee on Sports Medicine and Science: No. 3 Mental Management Study in Junior Stage Athletes: Second Report]: 5-50. (in Japanese)
- Ishii, M., Ishikawa, K., Takami, K., and Goto, H. (1996). Junior ki ni okeru yushushidousha no jittaichousa ni kansuru chousa kenkyu: Tsuiseki mensetsu chousa no kekka o motoni shite [Fact finding survey of junior stage coaches: Results from follow up interview study]. Heisei 7 nendo nihon olymic iinkai sports ikagaku kenkyuu houkoku: No. 3 Junior ki no mental management ni kansuru kenkyuu: Dai 3 hou [1995 Research Results Report of the Japanese Olympic Committee on Sports Medicine and Science: No. 3 Mental Management Study in Junior Stage Athletes: Third Report]: 3-24. (in Japanese)
- Jowett, S. (2003). When the “honeymoon” is over: A case study of a coach-athlete dyad in crisis. *Sport Psychol.*, 17: 444-460.
- Jowett, S. and Cockerill, I. M. (2003). Olympic medallists’ perspective of the athlete-coach relationship. *Psychol. Sport Exerc.*, 4: 313-331.
- Kanashiro, T., Fujioka, S., and Yamagami, S. (2006). Zukai gendai shinrigaku nyumon [Graphical explanation of introductory contemporary psychology]. Tokyo: Baifukan. (in Japanese)
- Kanayama, N. (1983). Sekai 20 kakoku nonverbal jiten [Non-verbal communication dictionary in 20 countries worldwide]. Tokyo: Kenkyusha Shuppan. (in Japanese)
- Kawanishi, C. (2000). Inshou keisei ni okeru taijin jouhou tougou katei [Integration process of interpersonal information in impression formation]. Tokyo: Kazama Shobo. (in Japanese)
- Kikkawa, M. (2005). Communication nouryoku no hyouka [Assessment of communication ability]. In Japanese Society of Sport Psychology (ed.), *Sports mental training kyohon* [Text book of sports psychology] (pp. 73-77). Tokyo: Taishukan Shoten. (in Japanese)
- Kikuchi, A. (2004). Notes on the researches using KiSS-18. *Bull. Fac. Soc. Welf., Iwate Prefectural Univ.*, 6: 41-51. (in Japanese)
- Kitamura, K., Saito, S., and Nagayama, T. (2005). How do expert coaches enhance athletes’ and team performance?: Construction of a coaching mental model of expert high school soccer coaches in Japan. *Jpn. J. Sport Psychol.*, 32: 17-28. (in Japanese)
- Komatsu, M. (2007). Tabi no hajimari [Start of journey]. In H. Toyoda (ed.), *Kyou bunsan kouzou bunseki Amos hen: Kouzou houteishiki modeling* [Using Amos in covariance structure analysis: Structural equation modeling] (pp. 1-23). Tokyo: Tokyo Tosho. (in Japanese)
- Lynch, J. (2008). Senshu no senzai nouryoku o hikidasu creative coaching (Y. Mizutani, K. Oita, & M. Tokoro Trans.). Tokyo: Taishukan Shoten. (Original work “Creative coaching” published 2001)
- Martens, R. (1991). *Coaching manual: Mental training* (K. Inomata Trans.). Tokyo: Taishukan Shoten. (Original work “Coaches guide to sport psychology” published 1987)
- Mehrabian, A. (1968). Communication without words. *Psychol. Today*, 2: 53-55.
- Mehrabian, A. (1986). *Higengo communication* (T. Nishida, Y. Tsuda, T. Okamura, & T. Yamaguchi Trans.). Tokyo: Seibunsha. (Original work “Silent messages: Implicit communication of emotions and attitudes” published 1981)
- Morris, D. (1980). *Manwatching: Ningen no koudougaku* (O. Fujita Trans.). Tokyo: Shogakukan. (Original work “Manwatching: A field guide to human behavior” published 1977)
- Murakami, Y. (2006). *Shinri shakudo no tsukurikata* [How to construct psychological scales]. Kyoto: Kitaoji Shobo. (in Japanese)
- Murata, K., Sakamoto, A., and Oguchi, T. (2008). *Shakai shinrigaku no kiso to ouyou* [Foundations and application of social psychology]. Tokyo: Foundation for the Promotion of the Open University of Japan. (in Japanese)
- Murohashi, H. (2007). *Tekigoudo shihyou* [Model fit index]. In H. Toyoda (ed.), *Kyou bunsan kouzou bunseki Amos hen: Kouzou houteishiki modeling* [Using Amos in covariance structure analysis: Structural equation modeling] (pp. 235-245). Tokyo: Tokyo Tosho. (in Japanese)
- Myers, N. D., Vargas-Tonsing, T. M., and Feltz, D. L. (2005). Coaching efficacy in intercollegiate coaches: Sources, coaching behavior, and team variables. *Psychol. Sport Exerc.*, 6: 129-143.
- Nakagawa, A. (1996). *Communication no houhou* [A way of communication]. Heisei 7 nendo nihon olymic iinkai sports ikagaku kenkyuu: No. 3 Junior ki no mental management ni kansuru kenkyuu: Dai 3 hou [1995 Research Results Report of the Japanese Olympic Committee on Sports Medicine and Science: No. 3 Mental Management Study in Junior Stage Athletes: Third Report]: 134-136. (in Japanese)
- Nakamura, R. M. (2001). *Senshu ga sodatsu positive coaching* (H. Nogawa & Y. Nagata Trans.). Tokyo: Scientist Sha. (Original work “The power of positive coaching” published 1996)
- Negishi, A. and Kikkawa, M. (2003). *Shidousha no communication nouryoku to coaching nouryoku no kanrensei* [Relationship between communication ability and coaching ability]. *Nihon sports shinri gakkai dai 30 kai taikai kenkyuu happyou shourokushuu* [Japanese Society of Sport Psychology 30th Annual Conference Program]: 96-97. (in Japanese)
- Oshio, A. (2008). *Hajimete no kyoubunsan kouzou bunseki: Amos ni yoru path kaiseki* [First-time analysis of covariance structure: Path analysis by Amos]. Tokyo: Tokyo Tosho. (in Japanese)
- Patterson, M. L. (1995). *Higengo communication no kiso riron* (T. Kudo Trans.). Tokyo: Seishin Shobo. (Original work “Nonverbal behavior: A functional perspective” published 1983)
- Patterson, M. L. (2007). Toward an integrative model of non-verbal communication. *Jpn. J. Interpersonal Soc. Psychol.*, 7: 67-74. (in Japanese)
- Rhind, D. J. A. and Jowett, S. (2010). Relationship maintenance strategies in the coach-athlete relationship: The development of the COMPASS model. *J. Appl. Sport Psychol.*, 22: 106-121.
- Sabock, R. J. (1991). *Coaching: A realistic perspective*. San Diego: Collegiate Press.
- Takano, S., Ueta, Y., Shibuya, S., and Tanaka, Y. (1998). A study on sport motivation and coaching evaluation. *Bull. Fac. Phys. Educ., Tokai Univ.*, 27: 19-31. (in Japanese)
- Tanaka, Y., Kikuchi, S., Kikkawa, M., and Imamura, Y. (1996). *Coaching evaluation (3): Coaching hyoutei shakudo no kaihatu* [Coaching evaluation (3): Construction of a coaching evaluation scale]. *Proc. Congr. Jpn. Soc. Phys. Educ.*, 47: 206. (in Japanese)

- Tokunaga, M. (2005). *Kyoyou toshite no sports shinrigaku* [Cultural sports psychology]. Tokyo: Taishukan Shoten. (in Japanese)
- Ueta, Y. (2004). A study of coaching (III): The communication skill on coaching of athletes. *Bull. Fac. Phys. Educ., Tokai Univ.*, 33: 29-34. (in Japanese)
- Vallée, C. N. and Bloom, G. A. (2005). Building a successful university program: Key and common elements of expert coaches. *J. Appl. Sport Psychol.*, 17: 179-196.
- Wada, M. (1992). Reconstruction of nonverbal skill scale and social skill scale. *Bull. Tokyo Gakugei Univ. Ser I, Sci. Educ.*, 43: 123-136. (in Japanese)
- Wada, M. (1996). Nonverbal communication: Examination from immediacy. *Jpn. Psychol. Rev.*, 39: 137-167. (in Japanese)
- Wada, M. and Wakabayashi, M. (1991). An experimental study on the effects of verbal and nonverbal behaviors on a job interview. *Jpn. J. Adm. Sci.*, 6: 71-80. (in Japanese)
- Weinberg, R. S. and Gould, D. (1995a). Communication. In R. S. Weinberg & D. Gould (eds.), *Foundations of sport and exercise psychology*, 4th Ed. (pp. 227-246). Champaign: Human Kinetics.
- Weinberg, R. S. and Gould, D. (1995b). Leadership. In R. S. Weinberg & D. Gould (eds.), *Foundations of sport and exercise psychology*, 4th Ed. (pp. 205-225). Champaign: Human Kinetics.
- Whiteside, R. L. (1975). *Face language* (H. Ishikawa Trans.). Tokyo: Yomiuri Shinbunsha. (Original work "Face language" published 1974)
23. Laughing out loud
 24. Narrowing one's eyes
- [Body Contact]
25. Shaking hands
 26. Touching the athlete's head
 27. Touching the athlete's shoulder
 28. Touching the athlete's back
 29. Touching the athlete's hand
- [Line of Sight]
30. Looking into the athlete's eyes while talking
 31. Avoiding direct eye contact
 32. Casting a sideways glance toward the athlete
 33. Looking down on the athlete
- [Paraverbal Communication]
34. Speaking in a loud voice
 35. Speaking in a soft voice
 36. Talking to the athlete using a stiff tone of voice
 37. Remaining silent
 38. Speaking with clear pronunciation
- [Interpersonal Distance]
39. Talking to the athlete face to face
 40. Talking while looking in the same direction as the athlete
 41. Talking within contact distance of the athlete
 42. Talking within arm's reach of the athlete
- Negative NVC: 21, 24, 31, 32, 33, 35, 36, 37 = Unfavorable Impression Formation; 2, 5, 9, 11 = Negative Attitude; 15, 16, 17, 18, 20 = Unacceptable Attitude; 12, 13, 14 = Exhibition of Perplexity.
- Positive NVC: 30, 34, 39, 40, 41, 42 = Positive Distance; 1, 3, 4, 6, 7, 8, 10, 38 = Positive Gesture; 25, 26, 27, 28, 29 = Positive Touching; 19, 22, 23 = Positive Expression

Appendix

NCSC

Please choose the option that best describes your impression of your coach's use of each type of nonverbal communication listed below and indicate the frequency with which your coach uses each type of nonverbal communication

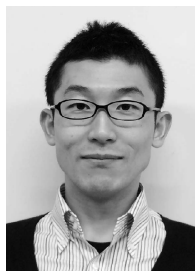
[Impression: 1 (Bad) -5 (Good)], [Frequency: 1 (infrequent) -5 (frequent)]

[Body Motion]

1. Leaning forward to explain
2. Leaning backward while sitting on a chair
3. Explaining using gestures
4. Nodding one's head
5. Sitting with one's cheek in one's hand
6. Clapping one's hands
7. Punch the air in celebration of victory
8. Serving as a model of skill
9. Spreading one's legs while sitting on a chair
10. Leaning forward to listen
11. Stomping one's feet
12. Touching one's neck
13. Covering one's mouth with one's hands
14. Spreading one's hands while raising one's palms upward
15. Putting one's hand in one's pocket
16. Putting one's hand behind one's head
17. Sitting with one's legs crossed
18. Hunching one's back

[Expression]

19. Always smiling
20. Furrowing one's brow
21. Never changing one's facial expression
22. Smiling

**Name:**

Takashi Shimazaki

Affiliation:

Research Associate, Faculty of Human Sciences, Waseda University

Address:

2-579-15 Milkajima, Tokorozawa-city, Saitama-pref., 359-1192, Japan

Brief Biographical History:

2005-2009 Undergraduate Program, School of Physical Education, Tokai University

2009-2011 Master's Program, Graduate School of Physical Education, Tokai University

2011-2014 Doctoral Program, Graduate School of Human Science, Waseda University

2011-2014 Part time lecture, Tokyo College of Sports and Recreation

2014 Received Ph. D at Waseda University

2014- Research associate, Faculty of Human Sciences, Waseda University

2015- Part time lecture, Department of Education, Hakuoh University

Main Works:

- Shimazaki, T., and Takenaka, K. (2015, Epub ahead of print). Evaluation of Intervention Reach on a Citywide Health Behavior Change campaign: Cross-sectional Study Results. *Health. Educ. Behav.*
- Shimazaki, T., Iio, M., Saito, M., Maeba, K., and Takenaka, K. (2012). Persuasive messaging to increase physical activity. *Jpn. J. Health. Psychol.*, 25: 38-48 (in Japanese)
- Shimazaki, T. and Takenaka, K. (2013). Relation between healthy lifestyle and health-related quality of life. *Jpn. Stress. Manag. Res.*, 9: 85-96. (in Japanese)
- Shimazaki, T., Maeba, K., Iio, M., Takenaka, K., and Kikkawa, M. (2013). Acceptability and Usability of Health Communications on Changing Health Behavior and Self-Efficacy. *Jpn. J. Health. Psychol.*, 26: 7-17. (in Japanese)
- Shimazaki, T. and Takenaka, K. (2013). Population-Based Health Communication: Distributing a Leaflet to Improve Physical Activity and Dietary Habits. *Jpn. J. Health. Psychol.*, 26: 119-131. (in Japanese)

Membership in Learned Societies:

- Japanese Society of Physical Education, Health and Sport Science
 - Japanese Association of Health Psychology
 - Japanese Society of Stress Management
 - Japanese Society of Sport Psychology
 - Japanese Psychological Association
-