Embodied Synchrony of Nonverbal Behaviour in Counselling: a Case Study of Role Playing School Counselling

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Abstract

Experienced counsellors have mentioned that the client-counsellor relationship, which is of high importance in counselling, may be related to embodied synchrony of nonverbal behaviour, but there is little quantitative research on the topic. The present study captured the embodied synchrony of nonverbal behaviour in counselling from a multiple communication channel perspective, in order to examine the relationship between these channels. At the same time, the relation between embodied synchrony and the mental processes of the client or counsellor, such as the sense of trust between counsellor and client, was investigated. 9-24 participants rated visual and vocal embodied synchrony and sense of trust in role-playing school counselling scenes. The results indicated that embodied synchrony, such as body movement coordination, similarity of voice strength and coordination and smoothness of response timing, have a co-occurrence relation. Moreover, significant correlations with evaluated sense of trust suggested that embodied synchrony can act as an indicator reflecting the mental process of a client or counsellor.

Counselling is a dialogue between a client and a counsellor who is a skilled listener, and is performed with the purpose of overcoming the client's mental difficulties or obstacles. The counsellor's verbal/nonverbal responses are experientially known to encourage the client's speech, and have the assistance function of guiding the client's thinking from a "confused state" to a "regulated state". Conventionally, in the case of investigating and evaluating counselling, the counsellor's verbal responses are examined as the key element, and only rarely attention is directed towards nonverbal responses. However, we may assume that nonverbal responses are also playing an important role in counselling. It is expected that analyzing the counsellor's nonverbal behaviour would give an important cue also about the characteristics of the response style of listeners in daily conversations.

In this study, embodied synchrony is focused upon as a cue to investigating nonverbal behaviour in counselling. Embodied synchrony is a phenomenon in which the interactants' nonverbal behaviour synchronizes and becomes similar; the listener's movements of the head or arms may synchronize with the flow of the speaker's speech, or the way of speaking, postures, mannerisms, and facial expressions may become similar (e.g. Cappella, 1981; Hess, Philippot, & Blairy, 1999; Feldstein & Welkowitz, 1978; Cheng & Chartrand, 2003). Up to the present, embodied synchrony has been described qualitatively by the subjective impressions of skilled counsellors with abundant experience in counselling, and has been considered to indicate the client-counsellor relationship, which is thought to be of primary importance in counselling. There is also some research which indicates quantitatively the congruence of posture in counselling dialogues (e.g. Charny, 1966), as well as other studies that indicate the relation between embodied synchrony, such as congruence of posture, duration of pauses or response latencies (i.e., latency before responding to the partner's last utterance), synchrony of body movements, and empathy (Maurer & Tindall, 1983; Staples & Sloane, 1976; Hall, Harrigan, & Rosenthal, 1995; Bernieri, Davis, Rosenthal, & Knee, 1994).

For measuring the degree of embodied synchrony of nonverbal behaviour, a method suggested by Bernieri & Rosenthal (1991) has been used. This method consists in judges evaluating directly the degree of the overall embodied synchrony in order to quantify it. As opposed to the conventional single-channel approach in which attention is directed towards a particular channel which is examined in detail, this method attempts at capturing nonverbal behaviour on a multi-channel level. However, this method cannot take paralanguage into consideration. To our knowledge, there has been no such method that allowed quantifying vocal synchrony overall.

Therefore, in this study, an attempt to quantify vocal embodied synchrony overall, adapting Bernieri *et al*. 's method to measure vocal embodied synchrony, in addition to quantifying embodied synchrony of body movement using this method, is carried out. In other words, it is one of this work's purposes to capture embodied synchrony from a multi-channel perspective. The necessity for investigating embodied synchrony on a multi-channel level was implied by Hall *et al.* (1995). In the present study, it is also examined whether embodied synchrony occurs as a

complementary or a co-occurrence relation between channels.

The second purpose of this research is to examine empirically the relation between embodied synchrony and mental processes of the client and counsellor, which change during the process of counselling. As mentioned above, the relation between embodied synchrony and the client-counsellor mental relationship has been known experientially, and there are also suggestions from some empirical research. For example, when two speakers having different opinions dialogue in order to reach a compromise through discussion and consideration of their partner's opinion, the response latencies of the two speakers' become similar, whereas when discussing to impose their opinion on the conversation partner, response latencies are not similar (Nagaoka, Komori, Nakamura, & Draguna, 2005). Therefore, embodied synchrony in counselling scenes can be anticipated to have high correlation with some mental processes, such as trust between the client and counsellor. In this study, as an indicator of mental process, firstly, the client's sense of trust towards the counsellor, evaluated by judges who listened to the vocal stimuli, was used. (Note: these evaluations were used because the comments of the parties involved in the counselling scenes on the results of the counselling session are unavailable). In addition, the contents of the speech and the nonverbal behaviour within the counselling scenes will be also considered.

Method

This experiment consists of two sections in which the embodied synchrony and the client's sense of trust towards the counsellor were evaluated. Furthermore, the evaluation of embodied synchrony consists of the evaluation of body movements coordination as a visual cue, and the evaluation of voice strength similarity, speech tempo similarity, and the coordination and smoothness of response timing, these representing audio cues. Participants in the experiment were asked to judge the visual cues, audio cues, and the sense of trust for each scene respectively. Correlations between ratings were also examined.

Stimuli

Two films from an educational material for teachers entitled "School education and counselling" (Miyamoto, T. and Yamada, T. ed.) were used, with the editors' permission: Case 1 - a dialogue between a junior high school female student and a female teacher, and Case 2 - a dialogue between a junior high school male student and a female school counsellor. Both cases represented role-playing, and according to an expert's comments (recorded on the DVD), in Case 1 (a 15-minute recording), "the enthusiasm of the counsellor had been conveyed to the student", however, "the student could not fully express her inner feelings", and Case 2 (27-minute) was considered to be "an example of good counselling", and "to some extent, there was already a rapport (good client-counsellor relationship) between the student and the school counsellor", with "a generally warm atmosphere." From hereon, the students will be referred to as "clients" and the school counsellor and teacher as "counsellors".

Four scenes were used for each case (Figure 1): Opening (after sitting down), Pre-empathetic phase, Empathy display, and Closing (the last 1 minute was excluded). The border between Pre-empathetic phase and Empathy display was marked by the first utterance expressing the counsellor's empathy towards the student: "that is rather hard…", in reference to the client being ignored by some of her friends in Case 1, and "that is indeed quite tough…", in reference to the client's parents never talking seriously about his path in life in Case 2. In Empathy display scene, the counsellor in Case 1 expresses her empathy verbally, and then continues with questions, inquiring about details regarding the client's situation. On the other hand, the counsellor in Case 2 keeps listening to the student's speech and then asks him questions. Each scene lasted about 30 seconds, which included both the client's and counsellor's utterances. The video and audio materials representing the stimuli were created using a film editing application (VideoWave Movie Creator; Roxio) and an audio-wave editing application (DigiOnSound; DigOn).

Ratings of Embodied Synchrony

Body Movements Evaluation

Judges Independent judgments on the synchrony of body movements were collected from 12 female and 12 male participants, age between 19 and 30 years. All the judges used Japanese as their mother tongue, had no visual or auditory impairment, and had not watched the recordings prior to the experiment.

Procedure The judges evaluated the recordings individually, in a laboratory where the background noise had a low level. The stimuli were presented on a 19-inch monitor (VGP-D19SM2, Sony), using a presentation software (PowerPoint, Microsoft, VGC-RA70PL9) on a computer, without sound. Participants rated the embodied synchrony on papers, after having watched each stimulus twice. There were three rating items: simultaneous movement, tempo similarity and coordination and smoothness, terms borrowed from Bernieri *et al.* (1988), and translated into Japanese. For example, for coordination and smoothness, the instructions given to the judges were as follows: "assume you are viewing a choreographed dance rather than a social interaction. How

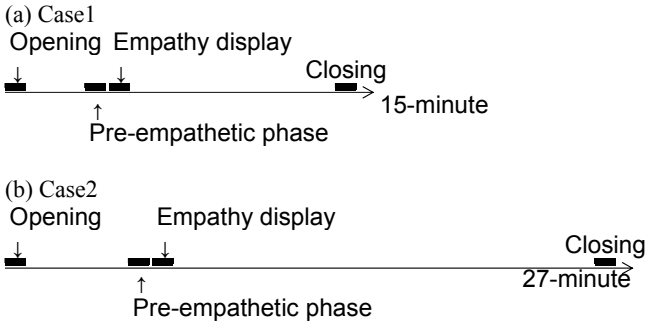


Figure 1: Stimuli's time serial position in counselling

smoothly does the interactants' flow of behaviour intertwine?" The judges gave ratings on 10-point scales, from 1 - very low level, to 10 - very high level, for each item. The stimuli were presented in random order, and four practice trials were inserted first.

Audio Evaluation

Judges Six female and three male participants between the ages of 22 and 30 years evaluated the stimuli. All the judges used Japanese as their mother tongue, did not have any visual or auditory impairment, and had not listened to the material prior to the experiment.

Procedure The ratings were conducted in a quiet laboratory, one to three judges at a time. The stimuli were presented from an active speaker (time domain light; TIMEDOMAIN) installed in front of the judges, using a presentation software (PowerPoint, Microsoft) on a computer, with no image. The stimuli were presented at a level of about 70dB(A) at the judges' position. The judges rated the embodied synchrony on paper, after having listened to each stimulus twice. The rating items were: voice strength similarity, speech tempo similarity, and coordination and smoothness of response timing. For example, in the case of coordination and smoothness of response timing, instructions given to the judges were as follows: "assume you are listening to a musical ensemble rather than a dialogue. How smoothly do the interactants' voices harmonize, without disturbing the atmosphere of the partner's speech?" The judges rated each item on 10-point scales. Stimuli were presented in random order, and four practice trials were inserted at the beginning. The judges were instructed to focus their attention only on prosodic cues, and not get influenced by the semantic content. These ratings were performed after rating the sense of trust, which will be mentioned below. This was because when listening for the first time to audio stimuli, it is supposed to be easier to pay attention to their semantic content rather than to only their prosodic characteristics.

Ratings of the Sense of Trust

Judges The participants were the same as those who rated the above-mentioned audio embodied synchrony.

Procedure Apparatus was the same as for the audio embodied synchrony ratings. Participants rated the client's sense of trust towards the counsellor on paper, after listening to each stimulus once. Since a speaker may trust their partner even if the conversation seems not to be successful, the judges were required to rate the stimuli only after very careful consideration. Each item was rated on a 10-points scale, from 1 - no trust to 10 - trust very much. The stimuli were presented in random order, and two practice trials were inserted at the beginning.

Results and Discussion

Similar to Bernieri *et al.* (1988), the mean rating values for the three items (simultaneous movement, tempo similarity and coordination and smoothness of response timing) for body movement synchrony were calculated, since the correlations between the three were very high. The mean for Case 2 (M =6.8) was significantly higher than the mean for Case 1 (M = 4.5) for body movement synchrony ($F(1, 51)$ = 43.0, $p<.001$, the two-way repeated-measures analysis of variance: ANOVA). On the other hand, since the evaluated targets for the three items for audio embodied synchrony are considered to be independent respectively, resulting in low correlations of the rating values for each item, they will be considered separately. The results for Case 2 (similarity of voice strength, M = 6.1; coordination and smoothness of response timing, M = 8.0) was significantly higher than those for Case 1 (voice strength similarity, M = 4.1; coordination of response timing, M = 4.9; voice strength similarity, $F(1, 24) = 12.5$, $p<.001$; coordination of response timing, $F(1, 24) = 23.8$, $p<.01$), though no significant difference was observed for speech tempo similarity (Case1, M = 5.3; Case2, M = 6.0; $F(1, 24) = 0.6$, *n. s.*).

Relation between communication channels

Significant high correlations were observed between body movement synchrony, voice strength similarity and coordination and smoothness of response timing, respectively (Table 1). This indicates that these synchronies are in a co-occurrence relation. However, speech tempo similarity correlated with neither channel significantly.

Time Serial Changes of Embodied Synchrony

Figure 2 indicates time serial changes of body movement synchrony, similarity of voice strength, speech tempo similarity, and coordination of response timing, respectively, as a function of time lapse of the counselling session.

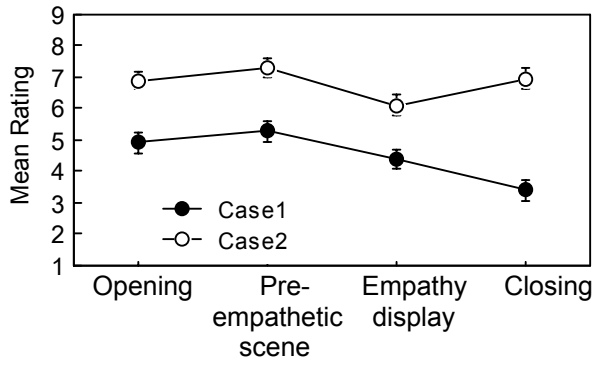
For rating values of body movement synchrony, we conducted a two-way repeated-measures analysis of variance (ANOVA) for cases (case1, 2) and scenes (Opening, Pre-empathetic phase, Empathy display and Closing). There were significant main effects of the case ($F(1, 51) = 43.0$, $p<.001$) and scene ($F(3, 51) = 10.1$, $p<.001$), and a significant interaction effect between case and scene ($F(3, 51) = 6.8$, $p<.001$). For the rating values of voice strength similarity, there were significant main effects of the case ($F(1, 24) = 12.5$, $p<.001$) and scene ($F(3, 24) = 5.1$, $p<.001$), and a significant interaction effect between the case and the scene ($F(3, 24) = 5.2$, $p<.001$). For the rating values of speech tempo similarity, there were significant main effects of scene ($F(3, 24) = 3.0$, $p<.05$), and a significant interaction effect between case and scene ($F(3, 24) = 8.3$, $p<.001$), although the main effect of case was not

Table 1: Correlations between the synchrony of communication channels

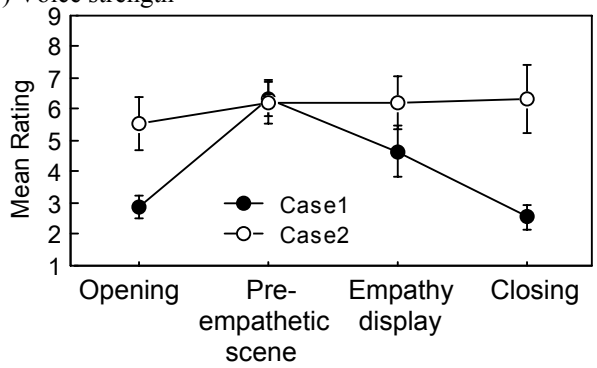
Communication channel	1	2	3	4
1. Body movement	-			
2. Voice strength	.78*	-		
3. Speech tempo	.33	.69	-	
4. Response timing	.95**	.88**	.53	-

*: p<.05, **: p<.01

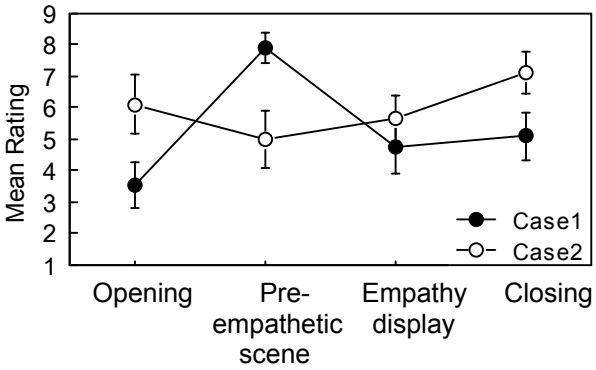
(a) Body movement



(b) Voice strength



(c) Speech tempo



(d) Coordination and smoothness of response timing

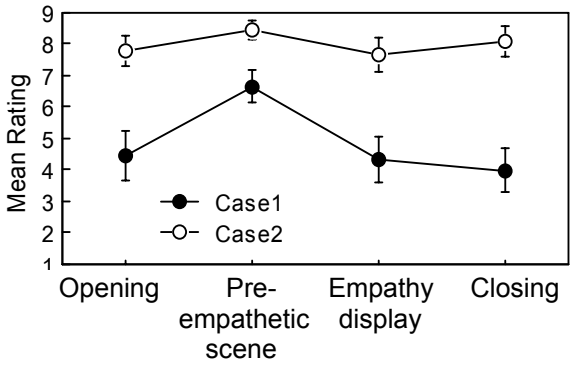


Figure 2: Time serial changes of embodied synchrony. Error bars represent ±1 standard errors.

significant ($F(1, 24) = 0.6$, *n. s.*). For the rating values of coordination and smoothness of response timing, we obtained significant main effects of the case ($F(1, 24) = 23.8$, $p<.01$) and scene ($F(3, 24) = 7.5$, $p<.01$), and a significant interaction effect of case and scene ($F(3, 24) = 2.5$, $p = .08$). Concerning body movement, voice strength and coordination and smoothness of response timing, in Case 2, described as an example of good counselling in which the rapport between the student and the counsellor had been established to some extent, a relatively high embodied synchrony was observed consistently throughout the session, from the Opening to the Closing scenes. On the other hand, in Case 1 in which the student could not express fully his feelings, embodied synchrony was relatively low and decreased remarkably in the Closing scene.

According to Figure 2, the variation pattern for speech tempo similarity in Case 2 significantly differed from that for the other parameters. In particular, the low synchrony level within Pre-empathetic scene in Case 2 is specific. In this scene, the client speaks at a fast tempo, imitating the tone of his parents who use to interrupt his talk. As compared to this, the counsellor responds in a calm tone, as she does in any other scene. The counsellor's moderate speech tempo throughout the session may mean that the counsellor's attitude is consistent, not related to or affected by any feelings expressed by the client. Also, using consistently moderate speech tempo may be interpreted as a strategy to express the counsellor's consistent attitude towards the client. Moreover, in this scene, nonverbal behaviour other than speech tempo indicated very high level of embodied synchrony. This cannot be disregarded, since this may imply the possibility that these channels have the function to compensate for the low level of speech tempo similarity.

Correlation between Embodied Synchrony and Sense of Trust

The client's sense of trust towards the counsellor was rated to be higher in Case 2 ($M = 7.9$, $SD = 1.6$) than in Case 1 ($M = 5.3$, $SD = 1.9$; $F(1, 24) = 30.4$, $p<.001$). Since it is assumed that a client would trust more a counsellor in good counselling, this result is not inconsistent with the expert's comments mentioned above. Figure 3 indicates time serial changes of the sense of trust. The sense of trust in Case 2 tends to improve gradually. In contrast, in Case 1 it decreases monotonously. The result of Case 2 may be interpreted as evidence indicating that the confidential relation between a counsellor and a client is established over time. The pattern of Case 2 implies that the sense of trust enhances in an early stage in good counselling, and the empathy displayed after the early enhancement in the sense of trust works effectively.

The mean rating values of embodied synchrony and sense of trust for each scene and item were calculated. The results of correlation analyses using these means indicated that

there is a significant high correlation between body movement synchrony, voice strength similarity, coordination

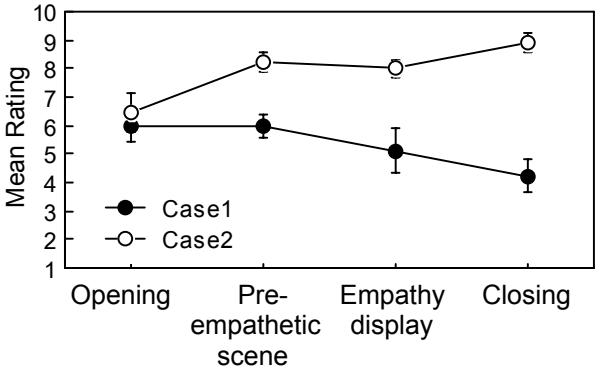


Figure 3: Time serial changes of the sense of trust. Error bars represent ±1 standard errors.

Table 2: Correlations between embodied synchrony and sense of trust.

Communication channels	The sense of trust
1. Body movements	.89**
2. Voice strength	.75*
3. Speech tempo	.30
4. Response timing	.87**

*: p<.05, **: p<.01

of response timing and sense of trust (Table 2).

These results imply that we evaluate a partner indicating synchrony with our own nonverbal behaviour to be trustworthy, and that we respond nonverbally, behaving in synchrony with a trustworthy partner. Moreover, this implies that when evaluating counselling, embodied synchrony of nonverbal behaviour between two persons, exception making the speech tempo, can act as an indicator of quality of the counselling and the client-counsellor relationship.

Charny (1966) indicated that postures of a client and counsellor become more congruent with the time course of the counselling session. However, the present results indicated that embodied synchrony did not increase constantly with the time course, but changed depending on the scene. Considering these two results, it is suggested that embodied synchrony of nonverbal behaviour reflects sensitively the speakers' mental processes, such as the client-counsellor trust relationship, which change with the time course of the interaction.

Semantic Contents of Speech and Nonverbal Behaviour in Counselling Scenes

It is suggestive that the rating values of body movement synchrony and coordination and smoothness of the response timing decrease in the Empathy display scene of Case 2 (Figure2). Concerning this, herein the mental process of the client may be inferred based upon the semantic contents and nonverbal behaviour displayed in the scene. Thereby, the relation between the speakers' mental process and their nonverbal behaviour will be examined.

Although the client spoke only a little bit at a time in the Opening scene, during the Pre-empathetic scene he spoke about his situation actively, with many gestures. At this time, the counsellor responded using gestures similar to the client's, this causing an increase in embodied synchrony. During Empathy display, after the counsellor's speech indicated empathy, the client revealed his feelings about his parents. Considering this, we may assume that in this scene, the client thought introspectively and faced his true feelings. The client's body movement and speech duration during the scene are smaller and shorter respectively than during the Pre-empathetic scene (based on the results of sound and image analyses). On the other hand, the counsellor nodded frequently during the speech of the client, with the probable intent of encouraging the client to speak. Thus, the differences in mental processes of the two are thought to find their expression in differences in their nonverbal behaviour, this explaining the low level of body movement synchrony and coordination and smoothness of response timing.

It is essential in counselling for the client to think introspectively. When doing so, it is possible that body movements are suppressed. This is confirmed by other cases that the authors have recently examined, in which body movements of the introspectively thinking clients are rather small, this possibly being the cause for low synchrony of nonverbal behaviour. Therefore, relatively low embodied synchrony does not necessarily reflect a bad situation in counselling. Indeed, the difference between evaluated sense of trust in the Empathy display scene and in the Pre-empathetic scene was not significant (Figure 3).

Furthermore, as compared with the counsellor in Case 1, the one in Case 2 was seated in a moderately relaxed posture, which may promote that the counsellor indicates higher embodied synchrony to the client's nonverbal behaviour, and spoke at slow speech tempo consistently. This counsellor did not always have verbal fluency, use fewer pauses, and shorter response latencies, which are assumed to be related to high conversation management (the degree to which speakers engage in smooth conversation) in ordinary interactions (Coker & Burgoon, 1987). All these imply that behaviour required in counselling situations is not always the same as behaviour required in ordinary conversations.

General Discussion

The present results indicated that embodied synchrony of nonverbal behaviour might occur simultaneously over multiple communication channels. The significance of this is that it may represent evidence that speech and body movement are integrated. However, it is necessary in the future to verify whether this is true in other interactions as well.

Further, the present results suggested that embodied synchrony (body movement coordination, similarity of voice strength and coordination and smoothness of response timing) can also act as an indicator of a client's or counsellor's mental process, such as sense of trust, which is strongly related to the quality of counselling. Of course, it is role-playing that the present study dealt with, rather than actual counselling. Since role-playing counselling is generally used as a method for the counsellor's skill acquisition, it is considered that the phenomena that occur in actual counselling occur also in role-playing counselling. Therefore, using role-playing counselling as an object for study is presumed to be significant.

Previously, such synchrony has been described qualitatively by the subjective impressions of experienced counsellors with abundant experience in counselling. Also, in counselling training, embodied synchrony has been scarcely explained. Therefore, we consider that the present study presents interest not only for filling in the gaps in the qualitative descriptions provided by expert counsellors, but it can also contribute to counselling training.

Concerning this study, some problems remain to be examined. Firstly, although the sense of trust rated by the student who played the client role should be taken into consideration, ratings of outside observers were used instead. Therefore, at present, we are collecting and examining data which contains clear comments of the persons involved in the counselling scenes. Secondly, only two cases were examined in this study. In addition, it may also be problematic that the same participant rated both the audio embodied synchrony and the sense of trust, and that the length of stimuli differed between cases. Therefore, in the future it is necessary to investigate whether the same results are obtained also for other cases. Although the present study used the method of evaluating embodied synchrony, specifying the physical factors involved in the perception of embodied synchrony is also required. Analyses of vocal sound in the counselling scenes indicated that the degree of embodied synchrony can be anticipated from the frequency of simultaneous speech that contains back-channels (i.e. the part of speech in which two speakers' vocalizations overlap).

In addition, the mechanism through which two speakers' nonverbal behaviour displays embodied synchrony it is rather unclear at present. If we assume that speakers' thinking strategies and their attitude towards counselling or their conversational partner are reflected in their nonverbal behaviour, it is possible that when talking with a counsellor, the client would be enabled to organize their thinking and the thinking strategies would become similar, hence their nonverbal behaviour would change and finally display synchrony with that of the counsellor. However, body movements' coordination originating in the ecological foundation of humans, upon which the dynamic systems approach (e.g. Schmidt & Turvey, 1994) have focused cannot be disregarded either, even within counselling scenes which may be viewed as advanced intellectual activity. In the future, it is necessary to investigate further the mechanism through which the synchrony of nonverbal behaviour is achieved.

Acknowledgments

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References

Bernieri, F., Davis, J., Rosenthal, R., & Knee, C. R. (1994). Interactional synchrony and rapport: Measuring synchrony in displays devoid of sound and facial affect. *Personality and Social Psychology Bulletin*, 20, 303-311.

Bernieri, F., & Rosenthal, R (1991). Coordinated movement in human interaction. In R. S. Feldman & B Rime(Eds.), *Fundamentals of nonverbal behavior* (pp.401-432). New York: Cambridge University Press.

Cappella, J. N. (1981). Mutual influence in expressive behavior: Adult-adult and infant-adult dyadic interaction. *Psychological Bulletin*, 89(1), 101-132.

Charny, M. D. (1966). Psychosomatic manifestations of rapport in psychotherapy. *Psychosomatic Medicine*, 28(4), 305-315.

Cheng, C. M., & Chartrand, T. L. (2003). Self-monitoring without awareness: Using mimicry as a nonconscious affiliation strategy. *Journal of Personality and Social Psychology*, 85, 1170-1179.

Coker, D., & Burgoon, J. (1987). The nature of conversational involvement and nonverbal encoding patterns. *Human Communication Research*, 13, 463-494.

Feldstein, S., & Welkowitz, J. (1978). Conversational congruence: Correlates and concerns. In A. Siegman, & S. Feldstein (Eds.), *Nonverbal Behavior and Communication* (pp.358-378). Hillsdale, NJ: Lawrence Erlbaum Associates.

Hall, J. A., Harrigan, J. A., & Rosenthal, R. (1995). Nonverbal behavior in clinician-patient interaction. *Applied & Preventive Psychology*, 4, 21-37.

Hess, U., Philippot, P., & Blairy, S. (1999). Mimicry: Fact and fiction. In P. Philippot, R. S. Feldman, & E. J. Coats (Eds.), *The Social Context of Nonverbal Behavior* (pp. 213-241). New York: Cambridge University Press.

Maurer, R. E., & Tindall, J. F. (1983). Effect of postural congruence on client's perception of counselor empathy. *Journal of Counseling Psychology*, 30 (2), 158-163.

Nagaoka, C., Komori, M., Nakamura, T, & Draguna, M. R. (2005). Effects of receptive listening on the congruence of speakers' response latencies in dialogues. *Psychological Reports*, 97, 265-274.

Schmidt, R. C., & Turvey, M. T. (1994). Phase-entrainment dynamics of visually coupled rhythmic movements. *Biological Cybernetics*, 70, 369-376.

Staples, F. R., & Sloane, R. B. (1976). Truax factors, speech characteristics, and therapeutic outcome. *The Journal of Nervous and Disease*, 163(2), 135-140.