

# Negation as Embodied Cognition : What Co-occurring Bodily Expressions Reveal about Negation

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## **Negation as Embodied Cognition<sup>1</sup>**

### **– What Co-occurring Bodily Expressions Reveal about Negation –**

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#### **1. Cognition, linguistic expression, and bodily expression**

All aspects of cognition, which make language possible for human beings, were shaped during the course of human evolution; in other words, the aspects of cognition have been conditioned essentially by interactions between our body—comprising the flesh, skin, bones, inner organs, perceptive organs, neurons, brain, and so on—and physical, biological, social, and cultural circumstances. Because of this genesis of our cognition, cognitive elements such as thoughts, emotions, concepts, and categories are shaped by our body faculties, including our ability to move, to interact with our environment, and to understand the world. This is the concept of embodiment that we understand as one of the most fundamental concepts in cognitive linguistics (see Johnson 1987; Lakoff & Johnson 1980, 1999).

Cognitive linguists presume that when we use language to communicate, our thoughts and emotions are reflected in our linguistic expressions. Thus, our thoughts and emotions can be observed in the linguistic expressions that we use. In addition, we typically use bodily expressions when framing linguistic expressions. Therefore, bodily expressions can also be treated as projections of thoughts and emotions. Although cognitive linguists argue the significance of investigating the body to understand cognition, they had not studied bodily expressions intensively until recently. However, from a cognitive linguistic perspective, it has now been recognized that investigations of bodily expressions and the linguistic expressions that co-occur with bodily expressions are significant; such research is being undertaken by a number of scholars (Kita 2000; Kendon 2004; McNeill 1992, 2005; Mittelberg 2007; Müller 1998; Sweetser 2007; Takeuchi & Miyashita 2008a, 2008b). In this paper, we follow this position and clarify that research on bodily expressions—in addition to studies on linguistic expressions—can reveal much about the nature of human cognition. The relationship between cognition, linguistic expressions, bodily expressions, and the body can be understood as follows:

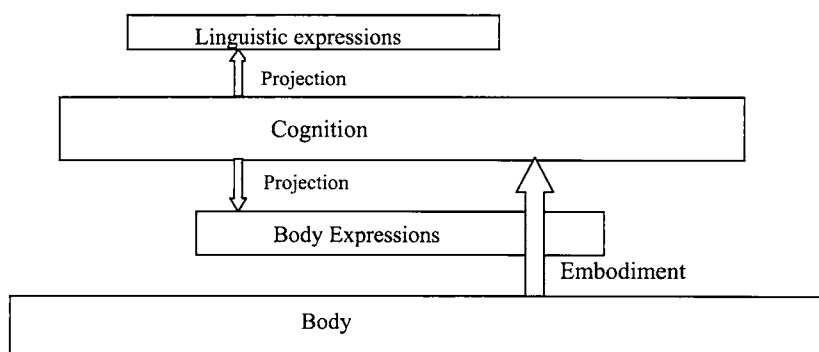


Figure 1

Among other things, this paper is concerned with negation among Japanese and German speakers as a bodily-based function.<sup>2</sup> Negation is one of our primitive cognitions, and the bodily expressions for negation are strongly influenced and motivated by our bodily and motoric conditions: we shake off dirt on our face by quick and repeating rotation of our head around the head axis; we wipe off dust on a surface of an object within the reach of the arm sideward, normally with a dominant hand in front of our chest; we react against disgusting food by vomiting it, and so on. These are the most natural and effective reactions of our body and are considered to be strongly connected with our bodily expressions of negation (Takeuchi 2004). In our examination of gestures of negation, we will address the following questions:

- What kinds of bodily expressions are commonly observed among people who speak Japanese and German?
- How do linguistic expressions and gestures interfere in the use of bodily expressions?
- Are there cross-cultural differences or similarities between the negative bodily expressions used in the two languages, and what are the differences or similarities?
- In what way is negative cognition bodily motivated?

To answer these questions, we produced a video corpus containing recorded interviews of Japanese and German speakers and used it for an analysis of the co-occurrence of gestural usage with negative verbal expressions. The following sections provide answers to the above questions.

## 2. Linguistic expressions and gestures

Negation can be expressed both through linguistic forms and bodily expressions. Negation can be expressed by diverse linguistic expressions. In English, for example, it is expressed by using negative particles (*not, never, no*) or expressed morphologically (*un-, a-, dis-*) and even lexically (*doubt, deny, prohibit*). As we analyze the interaction between linguistic expressions and gestures, we concentrate only on the linguistic expressions and their accompanying bodily expressions people exhibit when answering questions: gestures should typically play important roles in interpersonal communications and negation itself is often part of interactive discourse, we think we could have good chance to observe interactions between linguistic and figurative negative expressions. Therefore, in the following discussion, we primarily deal with a linguistic analysis of answers provided in response to positive and negative questions, i.e. questions accompanied with and without a negation expression.

### 2.1 Linguistic differences in negation between Japanese and German

It is well-known that there is a difference in the manner of responding to a negative question in Japanese and in Germanic languages such as German and English, although there are similarities in the manner in which affirmative questions are answered (Ota 1980, Pope 1976). In Japanese, as in German or English, if a person is asked a question containing a positive proposition and the person replies with an answer that is also positive, the answer would contain the affirmative answer particle “*un/hai*” followed by a positive proposition, though the latter is optional. If the answer is negative, it will contain the negative answer particle “*iya/ie*” which may or may not be followed by a negative proposition. However, if a person is posed a question containing a negative proposition and the answer is negative, the answer should contain the affirmative answer particle “*un/hai*,” followed by an optional negative proposition. If the answer is positive, the person will utter a negative “*iya/ie*,” followed by an optional positive proposition. The following examples illustrate the above cases:

- (1a) Eiga-o mi-ru no? (Will you see the movie?)  
Un, mi-ru yo (YES, I will)  
Iya, mi-nai yo (NO, I won't)
- (b) Eiga-o mi-nai no? (You won't see the movie?)  
Iya, mi-ru yo (NO, I will see it)  
Un, mi-nai yo (YES, I will not see it)

In (1b), if the question is answered with the negative answer particle “*iya*,” it indicates that the person will see the movie. If the question is answered with an affirmative answer particle, the utterance indicates that the person will not see the movie.

In German, the usage of particles is the same as that in Japanese with respect to the answer to the positive question. However, when the negative question is posed, the answer differs from the Japanese as well as the English answers:

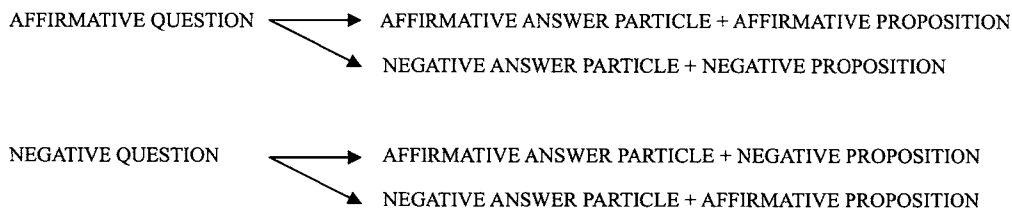
- (2a) Siehst du den Film? (Will you see the movie?)  
Ja, ich sehe ihn. (YES, I will)  
Nein, ich sehe ihn nicht. (NO, I won't)
- (b) Siehst du den Film nicht? (You won't see the movie?)  
Doch, ich sehe ihn. (YES, I will see it)  
Nein, ich sehe ihn nicht. (NO, I won't see it)

As in (2b), the negative answering particle “*nein*” is normally combined with a negative proposition, and the objection particle “*doch*,”<sup>3</sup> with an affirmative proposition. Therefore, the answer with the objection particle indicates that the person will see the movie, where the negative particle indicates that she/he will not see the movie.

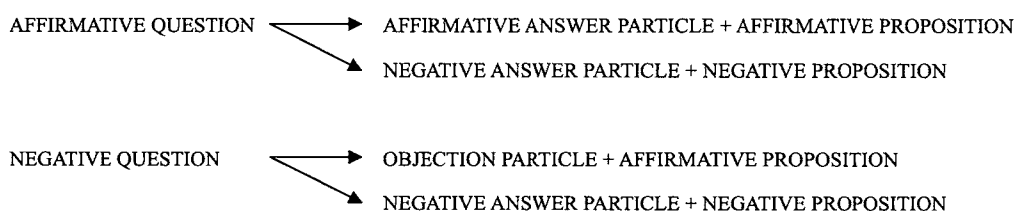
It has been reported that the Japanese system for answering questions is structured such that the respondent expresses agreement or disagreement with the questioner's assumption (Ota 1980: 640f., Pope 1976: 111f.). In a case like (1b), the questioner's assumption is that the respondent will not see the movie. However, since the respondent is willing to watch the movie, she/he expresses disagreement with the questioner's assumption with a negative particle.

Pope (1976: 118f.) explains why a special particle instead of the normal answer particle is used when expressing positive agreement, as is the case with German, where “*doch*” is used instead of “*ja*”: “The reason PD (= positive disagreement, T&M) so often has to have a special word is that it is the most semantically difficult or marked...” When answering a negative question in German, an answer containing the particle “*ja*” might be contradictory if the respondent wishes to express disagreement with the interlocutor's assumption: disagreement is a kind of negation, whereas “*ja*” indicates full affirmation. Therefore, “*doch*” is used in German instead of “*ja*”. Here, we can observe a slight resemblance between Japanese and German in that the answer is sensitive to the questioner's assumption. The manner in which a yes-no question is answered in the two languages can be schematized as shown in (3) and (4):

(3) The Japanese manner of answering a yes-no question



(4) The German manner of answering a yes-no question



**2.2 Working hypothesis—relation between linguistic and bodily expressions**

With regard to the gestures of negation, we make the following hypothesis: what we learn about cognition from linguistic analysis should be compatible with what we learn about cognition from an analysis of gestures. As seen in the previous section, a linguistic analysis of the manner in which questions are answered is conducted mostly on an introspective basis. Regarding this fact, the above assumption should be formulated as follows: inductive linguistic analysis should be compatible with empirical evidence obtained from the observation of gestures, or the suggested linguistic evidence should agree with the evidence obtained from the gesture analysis. This assumption could be correct because both linguistic and bodily expressions are considered as projections of our cognition, as shown in Figure 1. In this paper, we test our hypothesis by comparing the characteristics of a negative gesture which accompanies with a negative linguistic answering expression with those of that corresponding linguistic form.

To examine the relationship between linguistic negations and negative bodily expressions, we formulate the following hypothesis: Positive gestures—for example, nodding—will appear in an affirmative context; in the negative context, where linguistic negations such as negative answer particles or other negative elements are used, a negative gesture will be observed. We further assume that the linguistic differences between Japanese and German correspond to the gestural expressions among speakers of the two

languages. In the following, we will observe the gestural behavior in these languages and examine our hypothesis on that ground.

### **3. Contrastive analysis of Japanese and German gestures of negation**

As a basis of comparison between linguistic observations, we will contrastively analyze the gestures of negation used by Japanese and German speakers. We expect that negative gestures are also structured differently among Japanese and German speakers and we will confirm this through linguistic analysis.

#### **3.1 Procedure**

To investigate negative bodily expressions, we produced a video corpus containing the recorded interviews of Japanese and German participants, which we used for an analysis of verbal negation in combination with gestural usage. We interviewed four Japanese students in our university (two males, two females) and three German participants (one male researcher, one female and one male student), who were aged between 21 to 38, for approximately 20 to 30 minutes and recorded the interviews with a video camera. The participants were interviewed in a daily conversational fashion, but the questions to them that were supposed to trigger negative reactions were integrated into the conversation.<sup>4</sup> They were not informed about the purpose of the interviews. As we regard this study as a starting point of a further comprehensive study with an empirical approach such as priming test, we did not make effort to gather a big size of data in this study.

Speakers of both languages answered questions of roughly the same content. From our video data, we selected the cases in which linguistic and bodily expressions of negation co-occurred and then analyzed the kinds of bodily expressions that we observed, the occurrence of linguistic negation, and the differences in bodily expressions between the Japanese and German participants. We conducted both quantitative and qualitative analyses. In addition to the quantitative analysis, we evaluated the quality of the gestures using a subjective, i.e. an interpretative approach which we must take at the early stage of a comprehensive study; moreover, we identified and classified the bodily expressions that were judged to be common among the Japanese and German participants.

#### **3.2 Results**

During our analysis, we distinguished the following bodily expressions that co-occurred with negative linguistic expressions in both groups of participants:

Strong head shaking (Strong-HS)

Weak head shaking (Weak-HS)

Head tilting (HT)

Nodding (NOD)

Other spontaneous gestures such as hand swinging, frowning, and so on, were also observed. Since the size of our data is limited, we could not conclusively identify the spontaneous gestures as being relevant gestures of negation, and we decided to ignore them in order to maintain clarity in the discussion. However, this does not imply that they are of any less importance in the study of gestural negations. Table 1 illustrates the occurrences of these four main bodily expressions in each language:

Japanese	Occurrence	%	German	Occurrence	%
Strong-HS	43	13.2	Strong-HS	125	<b>45.6</b>
Weak-HS	102	<b>31.3</b>	Weak-HS	96	<b>35.0</b>
HT	132	<b>40.5</b>	HT	20	7.3
NOD	49	15.0	NOD	33	12.0
TOTAL	326	100.0	TOTAL	274	99.9

Table 1 Frequency of occurrence of the four main bodily expressions accompanying negative utterances

As shown in Table 1, although the total frequency of occurrence of gestures accompanied by negative utterances is not very different on an average, the frequency distribution of each gesture is different. While head tilting was the most frequently observed gesture among Japanese participants, strong head shaking had the highest frequency of occurrence among German participants. In the following, we will examine each gesture demonstrated by the two groups.

### 3.2.1 Head shaking

Head shaking was the most frequently observed gesture of negation among both the Japanese (44.5%) and German (80.6%) speakers. This can therefore be regarded as a prototypical gesture of negation in the two languages. In our data, two kinds of head shaking gestures were identified, namely, strong and weak head shaking gestures.<sup>5</sup> On the basis of this distinction, we demonstrate how head shaking gestures are carried out by Japanese and German speakers.

### 3.2.1.1 Strong and weak head shaking by Japanese speakers

One example of the two types of head shaking gestures used among Japanese speakers is observed in the following visual, the linguistic utterance of which is transcribed in (5), where “I” refers to the interviewer and “S” refers to the subject:

(5)



I: don don nomu? (Do you drink rapidly?)

S: iie, hotondo nomanai. (No, I drink little.)

Strong-HS                  Weak-HS

The participant gave a strong shake of the head when uttering the negative answering particle “*iie*” and a weak shake of the head when expressing negation in the sentence (“*nomanai*”). Compared to the German participants, the Japanese participants demonstrated rather weak head shaking (31.3%) than strong head shaking (13.2%).

### 3.1.1.2 Strong and weak head shaking by German speakers

A visual of head shaking by a German participant from our video corpus and the transcription of the scene are shown below:

(6)



I: Gibt es denn in deiner Familie richtige Säufer?

(Do you have an alcoholic in your family?)

S: Nö, ich glaube nicht. nö ... (No, I think not. No...)

Weak-HS Strong-HS < Strong-HS

crescendo

In this example, the participant gave a weak shake of the head when uttering the negative answer particle “*nö*” and a strong shake of the head uttering the negative particle “*nicht*.” A stronger head shaking was observed when he expressed the negation the second time by uttering “*nö*” again after the first sentence. As negative gestures, the German participants used strong and weak head shaking gestures very frequently (80.6%); moreover, strong head shaking was observed more frequently among the German participants as opposed to the Japanese participants (45.6% vs. 35.0%).

### 3.2.2 Head tilting

Head tilting is a gesture that also proved to be relevant for negation.<sup>6</sup> However, the occurrence of this gesture among Japanese and German speakers differs drastically in its frequency (40.5% vs. 7.3%) and in its manner. We consider this gesture as a typical gesture of the Japanese; moreover, the significance of this gesture in the two languages seems to be different.

#### 3.2.2.1 Head tilting by Japanese speakers

Among the Japanese participants, head tilting was the most frequently observed bodily expression co-occurring with negative linguistic expressions (40.5%), excluding the two types of head shaking. The following is an example of this gesture:

(7)



I: Ippai juuman-en?

(Hundred thousand yen for a cup of tea?)

S: Juuman-en ha nai kana.

(100,000 yen doesn't sound reasonable.)

HT

In this example, the question of whether someone would be willing to pay 100,000 yen for a cup of tea may seem absurd to the listener. In such an absurd kind of situation, where the listener would become embarrassing with respect to answering the question, Japanese speakers prototypically demonstrate head tilting gestures. From a traditional way of thinking about negation, one might suppose that this gesture is an expression of embarrassing and has nothing to do with negation. But as we indicated above, this gesture very often coincides with negative expression in Japanese communicational situation. We therefore assume that our cognition has a network structure where different kinds of factors are interconnected and a seemingly irrelevant factor does also play a role in the network structure of the cognition.

#### 3.2.2.2 Head tilting by German speakers

Head tilting as a bodily expression accompanied by negative linguistic expressions was also observed among the German participants. The following is an example that illustrates this gesture among German speakers:

(8)



- I: OK. Vielleicht ähm stören sich Leute, die teuren Kaffee trinken, also du auch, nicht am Preis?  
Oder was meinst du? (OK, perhaps the price doesn't matter for people who drink expensive coffee?)
- S: ..... (a long pause of 12 seconds during which participant exhibited HT.) Das weiß ich nicht. Ich mein, es sind verschiedene Möglichkeiten denkbar. (I don't know. I mean, we can imagine a number of possibilities.)

As seen in (8), the head tilting gesture of the respondent indicates deliberation: he is either seeking the answer or finds it difficult to determine the right answer. As the result of our consideration on other 19 examples, we conclude that this can be considered as a basic function of this gesture for German speakers.

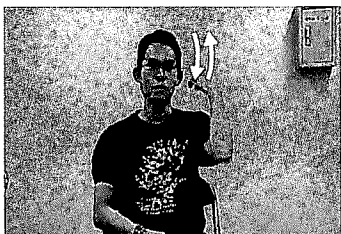
### 3.2.3 Nodding

Since the nodding gesture is commonly held to be an affirmative gesture and not a negative one, the co-occurrence of the nodding gesture with a negative linguistic expression seems very confusing at first glance. However, according to our data, there was significant co-occurrence of nodding with negative linguistic expressions (15.0% and 12.0% among the Japanese and German participants, respectively). For the Japanese speakers, this behavior might be partly explicable in terms of the co-occurrence of a positive answer particle and linguistic negation; as we have seen in section 2, Japanese listeners, as opposed to German listeners, indicate their acceptance of a negative question by using an affirmative particle that induces a nodding gesture, followed by a negative proposition (See example 1b). In this case, the nodding gesture often tends to be continued until the negative utterance comes to an end. Therefore, it would be understandable if only the Japanese participants exhibited this tendency of using the nodding gesture with negation. However, even the German participants occasionally displayed co-occurrence of the nodding gesture with linguistic negation. This seems to constitute diverging evidence in the linguistic analysis, which we will discuss in section 4. Additionally, in the case of Japanese participants, the co-occurrence of nodding and linguistic negation was not restricted to the abovementioned case. Next, we provide some examples to illustrate this point.

### 3.2.3.1 Nodding Gesture by Japanese speakers

Among the Japanese participants, there were cases where linguistic negation was accompanied by the nodding gesture. Let us consider one example of such a case:

(9)



I: Kazoku ni wa zenzen nome-nai hito-tte no wa iru-n-desu-ka? (Is there someone in your family who cannot drink any alcohol?)

S: Zenzen nomenai? (Someone who cannot drink at all?)

I: Un. (YES)

S: Zenzen nomenai kotowa nai-desu-ne. (It is not the case that they cannot drink alcohol at all.)

H T NOD

In this case, the participant tilts his head once while saying “*Zenzen nomenai kotowa*” (they cannot drink alcohol at all), which can be interpreted to some extent as his signal indicating his attempt to seek a suitable answer. Further, the nodding occurs simultaneously with the utterance of “*nai desu ne*” (it is not the case). This nodding gesture leaves us with an impression that the speaker uttered the negative judgment with confidence. The head tilting gesture before the nodding gesture strengthens the effect of confidence because it creates the impression that he is providing the answer after careful deliberation. For the Japanese participants, the nodding gestures that accompany the negative linguistic expressions observed in the study serve to assure the validity of the negative statements.

### 3.2.3.2 Nodding by German speakers

Strikingly, nodding was also observed by German speakers within the context of negation. An example of this gesture accompanied by a negative linguistic expression is shown below:

(10)



I: Liest du manchmal auch Philosophiebücher?

(Do you sometimes read philosophy books too?)

S: Ähm, eher nicht. Also nein, sagen wir mal nein.

(Ah, rather not. That is, no, let's say no.)

weak-HS

NOD

In example (10), first, the participant gives the negative answer “*eher nicht*” (rather not) in a hedged manner; then, he gives a clear-cut negation with a weak head shaking; finally, he confirms his negative answer by nodding. In this situation, although he first began his answer with a hedged expression, the participant seems to have wanted to clarify his message at the end of his utterance. In this case, the nodding can be considered to function as a confirmation of the utterance.

#### 4. Discussion

In the previous section, we illustrated the gestures that accompanied linguistic negations when the participants answered questions. The observation of the gestures may have some impact on the linguistic analysis of negation; not all gestural occurrences were compatible with our working hypothesis in 2.2. In this section, we discuss this “diverging” evidence from the linguistically expected behavior (4.1). It was also evident that the gestural tendency of the Japanese and the German participants differed in some respects. We will, therefore, attempt to explain how these differences originated. Moreover, we will argue that cultural background plays an important role in shaping the gestures used with negative cognition. In addition, we discuss the similarities in the gestures of Japanese and German speakers and explain them from the perspective of gestural embodiment (4.2). After presenting these contrastive observations, we further discuss the status of the gestures of negation with respect to gestures in general (4.3).

##### 4.1 Discussion on hypothesis

In contrast to the hypothesis in 2.1, the observed gestural behavior was different from that predicted on the basis of the linguistic analysis of negation. First, we confirmed the occurrence of an unexpected gesture, that is, head tilting. This gesture was very frequently observed among the Japanese participants. The difference between Japanese and German participants with respect to head shaking was also clearly evident: German participants demonstrated head shaking (80.6%), especially strong head shaking (45.6%), very often while uttering negative words. Furthermore, although the same variation

could be observed by Japanese as well as German speakers, the frequency distribution of each gesture differed considerably with respect to the general distribution. Finally, it is perhaps most interesting that nodding, which we regard as a typical gesture of affirmation, was present in the negative linguistic contexts for both languages. Why has the hypothesis failed? In the following, we examine each contradictory component in the data pertaining to gestures.

As seen in the video corpus, head tilting co-occurred with linguistic negation, especially in the case of Japanese speakers. Among Japanese speakers, head tilting has a certain function, and it is not always related to negation. It often serves as an expression of uncertainty. In example (11), this gesture accompanied an utterance where the participant was uncertain about how she should answer the question and how she should seek this clarification:

(11)



I: Kyou wa okane ha takusan motte-ru-n-desu-ka

(Are you carrying a lot of money with you?)

S: Iya mottenai. Ni-san-zen-en kuraidato omoi-masu.

(No, I don't. About 2000 or 3000 Yen, I think.)

Weak-HS HT

Additionally, as an extension to such typical usage, head tilting also serves as a conflict damper in situations where the speaker would rather avoid the direct expression of his/her opinion, especially if it could be perceived as a face-threatening act by the communication partner. If a person expresses his/her opinion in a manner that conveys that he/she does not know much about the issue, he/she can reduce the risk of directing a face-threatening act toward his/her partner (cf. Takeuchi & Miyashita 2009). As is probably the case with all human communities, negation is a situation that could be perceived as a face-threatening act. This tendency is especially strongly observed in the Japanese community. If the communication partner's assumption or intended speech act is denied, the possibility of a face-threatening situation arises. Therefore, head tilting—which was originally a marker of uncertainty—is now also used as a conflict damper. This explains the frequent occurrence of head tilting among the Japanese participants. It comes from the cultural needs of the Japanese community. Among German speakers, this gesture also serves as an expression of uncertainty. However, because of a different cultural background in which saying “no” could be done rather without hesitation<sup>7</sup>, the extended

use of the head tilting gesture as a conflict damper is not observed there. Among German speakers, the head tilting gesture is only combined with uncertainty, and it can, therefore, be interpreted as an expression that indicates that the speaker is attempting to seek the correct answer. In this sense, head tilting is not really diverging evidence to the linguistic analysis of negation. Further, this gesture has another communicative function that can overlap with linguistic negation.

The reason why head shaking gestures were more frequently observed by German speakers can also be explained as follows. Among Japanese speakers, head shaking gestures is regarded as a signal of apparent negation. As discussed so far, this can be perceived as a face-threatening act toward the communication partner and is therefore avoided. The greater frequency of the occurrence of weak head shaking among Japanese speakers can also be explained by this cultural restriction; weak head shaking is a less face-threatening act than strong head shaking. Among German speakers, there is no such strong restriction; hence, the clearer expression of negation is preferred. Consequently, the different occurrences of head shaking also do not constitute diverging evidence to the linguistic analysis of negation if the cultural background is taken into consideration.

A serious problem encountered in the testing of our hypothesis is the co-occurrence of nodding with linguistic negation. Typically, nodding is considered to be a gesture of affirmation. In this case, nodding can therefore be considered as diverging evidence of the linguistic analysis because it does not correspond with the mediated outcome of the analysis. This phenomenon is not unknown in the study of gestures; to use a term coined by McNeill (2005: 136), we are dealing with speech-gesture mismatch in this case. Speech-gesture mismatch is defined as a mismatch that occurs when speech conveys one version of a situation and the accompanying gesture, a different version, which is also the case with our examples in (9) and (10). As shown in the examples, although nodding gestures appear to overlap with the role of the accompanying negative expressions, it obviously has another function: it contributes to the confirmation of the negative utterance made by the speaker. In other words, it indicates the speaker's confidence that the utterance is correct. This gesture is therefore not located at the propositional level at which the negation is expressed; rather, it confirms the utterance at the meta-level where the utterance operates.<sup>8</sup> This is a good example that demonstrates the degree to which gestures contribute to our communications; it complements the sound language, which is restricted because of its linearity, and enables us a double tracking of communication. It can mediate a different, additional cognition by means of bodily-based cognition. We can, therefore, state that if we are aiming at a deeper understanding of the human

cognition, we need a multimodal analysis of communication. As this example of nodding also suggests, gestures often seem to work at a level that is higher than the propositional level. Thus, they can mediate the meta-communicative or interpersonal function in addition to the information coded by linguistic means.

## **4.2 Contrastive observations**

In the previous section, we indicated that to some extent, the bodily expressions of negation differ functionally between the Japanese and Germans. In this section, we conduct a detailed analysis of the differences and similarities between gestures used by Japanese and German speakers from a contrastive perspective.

### **4.2.1 Gestural differences**

First, according to our interpretation of the data, it can be confirmed that each co-occurring gesture with Japanese and German expressions has some functional differences, though these differences can often be subtle. In the following, we discuss the differences by gesture.

#### **4.2.1.1 Head shaking**

Although head shaking was observed among speakers of both languages, there seems to be a functional difference between the two. Japanese speakers appear to use a strong head shaking gesture to express disagreement with the questioner's assumption or expectation (Takeuchi & Miyashita 2008a). A prototypical situation where strong head shaking co-occurs with a negative linguistic expression is an instance of such a case. Let us examine the previous example in (5), where the Japanese participant demonstrates a strong head shaking gesture, which is again cited below:

(5) I: don don nomu? (Do you drink willingly in a high pace?)

S: iie, hotondo nomanai. (No, only a little bit.)

Strong-HS      Weak-HS

The question deals with the participant's lack of willingness in accepting the traditional idea of being a bad Japanese female student (since "drinks very much" indicates that she is a heavy drinker). Moreover, owing to the previous context where she was asked if she likes to drink, she is expecting the questioner to believe that she is on the verge of being an heavy drinker unless she explicitly negates this expectation. In this eventually

face-losing situation, strong head shaking is observed. Thus, strong head shaking among Japanese speakers is connected with the rejection of an assumption of the communication partner. This gesture is also mostly related to linguistic expressions used by the Japanese. Among Japanese speakers, strong head shaking often co-occurs with the negative answer particle “*iie/iya*.” This indicates that among Japanese speakers, uttering a negative answer particle has a communicative function, namely, expressing disagreement with the questioner’s speech act or assumption. This connection with the communicative assumption of the partner is also applicable to the positive answer particle. As seen in the linguistic observation in 2.1, when a negative question is posed, Japanese speakers answer with an affirmative answer particle, whereas in the same context, German speakers answer with a negative particle (See 3 below). To some extent, the explanation for this could be that the answer relates to the assumption of the communication partner, and therefore, the affirmative answer particle is used (Ota 1980: 640f.). Thus, we argue that in general, answer particles in Japanese are connected with the questioner’s speech act or assumption.

Among German speakers, however, this communicative function of the strong head shaking gesture is not clearly evident. In example (6), the stronger head shaking gestures strengthen the negation in that he became more confident about the questioned content as he continued answering the question. However, it cannot be concluded that strong head shaking by Germans has the communicative function of expressing disagreement with the questioner’s assumption. The questioner’s assumption and the respondent’s agreement or disagreement with the assumption or the speech act of the questioner play a relatively small role among German speakers.<sup>9</sup> Among German speakers, head shaking gestures seem to mark propositional negation that deals primarily with the negative polarity of the proposition in an utterance. Among German speakers, if a negative utterance contains negative polarity, it is consistently expressed through head shaking while the answer and the sentence following it are uttered. The negation signaled by answering with a negative particle or head shaking has, therefore, little to do with disagreement with the communication partner’s assumption.<sup>10</sup> In sum, head shaking accompanying a Japanese expression, especially strong head shaking, is considered as interpersonally oriented, but head shaking among German speakers is rather propositionally oriented.

#### **4.2.1.2 Head tilting**

Among both the Japanese and Germans, head tilting can be regarded as a gesture that signals uncertainty or the action of deliberating. As seen in 4.1, often, head tilting further

serves as a conflict damper between Japanese communication partners, when one partner would rather avoid the direct utterance of one's own opinion, especially when it can act as a face-threatening for the other partner. We did find evidence of this function among German speakers. Among German speakers, this gesture indicates that the person is uncertain about the question and is trying to determine the correct answer.

#### 4.2.1.3 Nodding

Nodding is a prototypical gesture that indicates the degree of affirmation in gestural communication. However, as already seen, it can also be observed in the context of negative utterances among the speakers of both languages. In this case, we can further distinguish a slight difference between the gestural usage of Japanese and German speakers. Let us again consider the example of the use of nodding in Japanese:

- (9) I: Kazoku ni wa zenzen nome-nai hito-tte no wa iru-n-desu-ka?  
(Is there someone in your family who cannot drink any alcohol?)  
S: Zenzen nomenai? (Someone who cannot drink at all?)  
I: Un. (YES)  
S: Zenzen nomenai kotowa nai-desu-ne.  
(It is not that they cannot drink alcohol at all.)  
H T NOD

As already seen previously, in this case too, meta-confirmation is expressed by nodding. However, at the same time, it seems to have another function: it can also be interpreted as a gesture to propel the utterance. In the last utterance, he confirmed the question by asking "*Zenzen nomenai*" (someone who cannot drink at all) and then after deliberating about it, he uttered the answer accompanied by a nodding gesture. Here, his utterance is held to be encouraged by the simultaneous gesture of nodding. We would say that the fundamental function of the nodding gesture by German speakers is almost the same as that of Japanese speakers—to confirm the utterance with confidence. However, the encouraging and promoting function of the nodding gesture seems to be stronger for Japanese speakers.

#### **4.2.1.4 Summary and general observation of differences**

To summarize the contrastive analysis, we can say that there is a cognitive-functional difference in the manner in which questions are answered by Japanese and German speakers; for Japanese speakers, disagreement or rejection seems to be important as a factor of negation. In contrast, for German speakers, propositional negation is a more important function than disagreement. Moreover, head tilting functions as a conflict damper for Japanese speakers, but not for German speakers. Head tilting by German speakers indicates that the right answer is being deliberately sought. In several cases, nodding co-occurs with negative expressions in both the languages. In such cases, nodding is seen as a confirmation of meta-level cognition. Although this seems to be the case in both languages, nodding has an additional function among Japanese speakers, it can also serve as a propelling factor for an utterance.

We can now speculate as to how these differences are correlated with each other. We assume that they are attributed to the cultural background that is dominant in each language community. The Japanese are often said to be shy or polite and have difficulty in saying “no.” Nevertheless, if one says “no,” this behavior will be understood not as a plain propositional negation, but as an interpersonal action of disagreement or rejection that must be performed so that the respondent can save face. The head tilting gesture, which is observed frequently among Japanese speakers, also appears to be related to this cultural background; this is one point of distinction between the Japanese answering pattern and the German way. If in order to avoid a conflict, one hesitates to say “no” or to voice his/her opinion directly, then a conflict damper is employed. Head tilting, which indicates uncertainty or deliberation, fulfills the purpose of avoiding a direct negation, which can cause conflict. Nodding among Japanese speakers, which is used to encourage a negative utterance, can also be understood in this regard: a Japanese person needs a propelling gesture for his/her negative utterance because an utterance that can contradict the partner’s assumption is not desirable. In contrast, there are no such cultural constraints among German speakers; therefore, we observe these differences between the two languages. Thus, the cultural background in each language community should be considered to affect the gestural behavior related to negation.

#### **4.2.2 Gestural similarities**

After the discussion on the differences between the gestural behavior of the Japanese and German speakers, the following question arises, which contrasts the question we have examined thus far: Why are there similarities between Japanese and German speakers’

gestural behavior, although they are culturally different? Is there any common principle that controls the gestural behavior for the speakers of the two languages? We will address these questions from an evolutionary perspective. We claim that the similarities are attributed to the evolutionary origins of gestures and that this genesis explains why these gestures of negation are used. In the previous observation, we confirmed that head shaking, head tilting, and nodding are similar gestures. We further examine these gestures in the following sections.

#### **4.2.2.1 Head shaking as a metaphorical embodiment of negative action**

We suppose that head shaking originated from the primitive experience of negation through the process of abstraction or bleaching. In our ordinary experience, we wish to remove or wipe off an object in front of us if we find it interruptive, that is, we have a negative attitude toward the object. In this case, there is a movement from one side to another to remove the object. This movement is considered to be the metaphorical source of head shaking: the movement required for head shaking is similar to the side-to-side movement described above, except that in head shaking, only the head is used instead of the hand or arm. Thus, head shaking is regarded as the result of the metaphorical transfer of the wiping-off action. However, with respect to head shaking, this concrete image is more abstract in the sense that it cannot serve as an action that demonstrates spatial preference and serves merely as a marker of disagreement or a more abstract marker of negation.<sup>11</sup> On this basis, we can argue that abstractly, negation is conceived metaphorically as a wiping-off action, i.e., negation is perceived to be an action that removes the interruptive object (Takeuchi 2004).

Darwin (1872) came to a similar conclusion on the basis of ontogenetic observation. He observed that a baby moves his/her head forward when accepting food, but moves his/her head to the side or tosses it backward when rejecting food. From this observation, he concluded that head shaking originated from the head movements accompanying the rejection of food; that is, it originated from the negative action that individuals showed toward an object during their infancy. Although this explanation differs slightly from ours in the preceding paragraph based on Takeuchi 2004, the two explanations are fundamentally similar in the following respect: Darwin's explanation also considers body action as a crucial factor in the emergence of head shaking as a negative gesture. Furthermore, his explanation also considers the removal of the object as crucial for the emergence of the gesture. Hence, irrespective of which hypothesis is more plausible, we can at least assume that the cognition of removal plays an important role in the emergence

of the head shaking gesture.

#### **4.2.2.2 Head tilting as a metaphorical embodiment of difficulty in understanding**

For German speakers, similar to Japanese speakers, head tilting is interpreted as a bodily expression that indicates the speaker's difficulty in understanding something complicated and his/her uncertainty. Why is this interpretation associated with head tilting? We assume that the emergence of this gesture is explained by the body actions that we make when we do not have a good visual understanding of an object: we tilt our head and observe an object from another angle so that we can see it better. The more information we have about an object, the easier it is to understand the object. A person tilts his/her head when attempting to obtain a better view of an object. Once clarity is obtained, the person will no longer tilt the head; however, if there is still lack of clarity, the person will continue to tilt the head. Thus, this gesture literally deals with the conceptual metaphor SEEING IS UNDERSTANDING. This body action performed when one is thinking serves as the source of the head tilting gesture. Therefore, we can state that head tilting is also based on our bodily actions. Further, once it is conventionalized as a gesture, it can be used in an abstract manner, for example, when Japanese and German speakers are confronted with a question on which he does not know how to react.

#### **4.2.2.3 Nodding as a metaphorical embodiment of acceptance and affirmation**

We discuss about the nature of nodding here briefly, because it consists a part of the whole network of the negative cognition in the sense that it is occasionally accompanied by negative linguistic expressions. Many of our basic actions such as go, run, see, speak, throw, kick, give, take, hit, sit down, stand up, and so on, are performed along the sagittal plane of the human anatomy. Our body has been shaped through the evolutionary process in a biased manner such that our perceptual organs are located at the front of our body, and we usually move forward and not backward; thus, our body functions best along the sagittal plane. Nodding is also performed along this sagittal plane, and it is easily produced when the body is performing a movement.

According to Darwin (1872), the origin of this gesture can be traced back to the action of a baby, moving his/her head forward when accepting the food provided by his/her parents. This explanation is again based on the behavior of the human body. In addition, we assume that the nodding gesture is associated with an up-down movement, which is easily produced because of gravity, our muscular strength, and bone structure when we are performing an action. In other words, this movement is produced when our

action continues without obstruction. This body experience, which is often combined with a positive attitude, can also be metaphorically transferred and functions as an indicator of acceptance. Thus, nodding can also be viewed as being the embodiment of a concrete body experience.<sup>12</sup>

#### **4.2.3.4 Universality of negative gestures**

As we have seen so far, negative gestures are considered as the results of the embodiment of negative cognitive experiences by our body. If this is the case, we can further assume that negative gestures are universal, not in the sense that they are observed everywhere, but that they have such potentials. This is because essentially, the human body structure and abilities with respect to movement or action are the same and not affected by cultural differences. This seems to be true for facial expressions as well. Ekman & Friesen (1975) showed that there are universal aspects of human facial expressions. They examined the thesis presented by Darwin (1872) wherein he stated that facial expressions indicating that human emotions are universal, and they were able to prove Darwin's hypothesis by their experiments. This raises the question of whether this universality applies to gestures made using other body parts.

Kendon (2004:337) points out that gestures that deal with negation and affirmation, certain interpersonal regulatory gestures, pointing gestures, and gestures that indicate the size, shape, and height of things, may all be found to be similar across different parts of the world. With regard to the gestures of response, that is, "yes" or "no," Spitz (1957) indicates in this developmental study that these gestures are universal, whereby he confirms the co-occurrence of "no" with head shaking and of "yes" with nodding.<sup>13</sup> Thus, the gestures demonstrated by Japanese and German participants seem to be prevalent world wide and can be considered as relatively universal. However, not all gestures are as widespread as "yes" or "no" gestures.

Morris et al. (1979) examined the usage and distribution of twenty different gestures in Europe, and most of these gestures showed multifunctional uses.<sup>14</sup> This raises the following question: why are some gestures widely used and universal, while other gestures are not? We assume that this difference among gestures is determined by the degree of embodiment: the greater the degree of embodiment of a gesture, the more universal is the gesture. For example, our facial expressions are fully embodied and are automatically triggered by our emotional states. These bodily expressions, therefore, demonstrate maximal universality, as claimed by Ekman & Friesen (1975).

The gestures of negation or affirmation are also bodily-based actions, but to a lesser

degree than facial expressions. Thus, these types of gestures indicate a partial universality, which can also differ depending on the degree of embodiment. At the other end of the continuum, there is a cultural determination of gestures. This can be observed, for example, in the ring gesture (made by joining the thumb and index finger to form a ring). According to Morris et al. (1979), this gesture—which means “ok”—originated from the resemblance between the first letter of the linguistic expression “ok,” that is “o,” and this gesture. This gesture is completely determined by the linguistic conventions of the English language. It can be graded as being culturally-determined to the maximum extent. The relationship between universality and body or cultural factors can be summarized as follows:

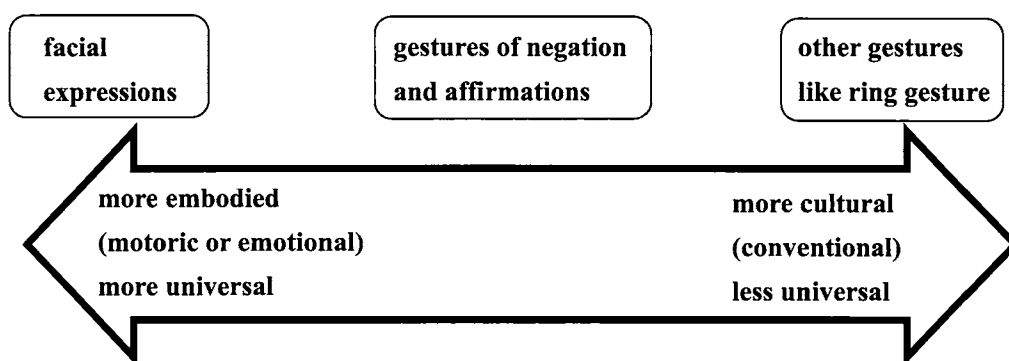


Figure 2 Degree of embodied and cultural determination

#### 4.3 Gesture of negation

In our data, head gestures have been primarily observed as gestures related to negation. Admittedly, because of the controlled condition under which the data was collected, the data from our video corpus was limited. Nevertheless, we can say that our analysis clearly showed that head gestures are considered as prototypical gestures of negation. In particular, we regard head shaking as the prototypical gesture of negation among head gestures.<sup>15</sup> In addition, we showed that some hand gestures also indicate negation. Morris et al. (1979) deal with two hand gestures that can express negation. These are the teeth flick and the chin flick in which the teeth or the chin is flicked by the nail of the thumb or fingers. However, these gestures seem to be used to indicate a relatively definite connotation of negation. According to them, the teeth flick used in South Europe basically implies “*I have nothing.*” The chin flick is applicable to all kinds of

negative statements such as “*It’s impossible,*” “*I have never seen him,*” “*I cannot help you,*” and so on. Obviously, these gestures are not as frequent as the head gestures of negation. Moreover, it seems that only head gestures contribute to the more abstract forms of negation.<sup>16</sup> However, why are head gestures more adequate for negative gestures as compared to gestures made with other parts of the body? This again seems to be related to the restrictions imposed by the human body structure; head gestures are easier to produce in comparison to gestures made with the hand or other body parts. Moreover, head gestures can also be produced when our hands are engaged in some other activity. Since negation is a frequent occurrence, the easier method of gesturing is preferred over the other.

According to the classification of gestures by McNeill (2005), head gestures as prototypical gestures of negation can be characterized as emblems. On the basis of Kendon’s work, he identified four types of gestures: gesticulation, emblems, pantomime, and signs. Emblems are defined as conventionalized signs such as the ring gesture for ok. As pointed out in the previous section, we can further differentiate between at least two types of emblems: universal emblems and culture-specific emblems. Head shaking or nodding will be regarded as the former.

## **5. Conclusion**

In this paper, we investigated negation with respect to bodily expressions and linguistic expressions of negation by using data from a video corpus of Japanese and German participants. The analysis of the data revealed four types of gestures related to negation. Our hypothesis was that gestures correspond to the behavior of co-occurring linguistic expressions, and provide converging evidence. However, this hypothesis had to be revised; because differences were found between Japanese and German speakers with respect to the usage and functionality of gestures, and these differences appeared to be derived from differences in their cultural backgrounds. Moreover, we observed a mismatch between gesture and speech, which contradicts our hypothesis. The diverging evidence suggests that the study of bodily expressions contributes to a deeper understanding of our social and cognitive activities. However, the evidence can also be explained from social and cognitive perspectives.

We further discussed in detail the gestural differences and similarities between the two languages. We claimed that the differences are mainly based on the cultural backgrounds of the two linguistic communities. With regard to the similarities, we proposed that the gestures related to negation are bodily motivated, thereby demonstrating their universal

character, although they can vary depending on embodied or cultural factors. In conclusion, we can state that negation is both bodily and culturally determined instead of being a purely formal-logical operation reversing truth values.

## Notes

1 This research is supported by Grand-in-Aid for Scientific Research (C) 19500223 from Japan Society for Promotion of Science.

2 We are concerned with negative body expressions co-occurring with linguistic expressions. For negative body expressions or negative signs in sign language, see, e.g., Zehan (2004).

3 Generally, this particle is used to express an objection against the expectations of the communication partner. Therefore, in this paper, we refer to it as an objection particle. German differs from English in the use of this answer particle in a reply to a negative question. However, in German, there is also a case where, like English, the answer particle “*ja*” can be used against a negative question. Helbig & Buscha (1991: 612) cites the following example:

Hat er nicht gut gespielt? (Didn't he play well?)

Ja, er hat gut gespielt. (YES, he played well.)

Nein, er hat nicht gut gespielt. (NO, he didn't play well.)

In this case, the question seeks confirmation and can be paraphrased with an affirmative question—“*Hat er doch gut gespielt?*” (He played well, didn't he?). In this question, the negative particle “*nicht*” cannot be stressed and considered as a modal particle.

4 One example of these questions is “*Have you ever seen snakes in our university?*”

5 These two variants are, of course, continuous in nature. As stated before, the distinction is based on our interpretative judgments which rely mostly on the size and strength of movements.

6 Before we began the empirical analysis, we did not expect to find this gesture playing an important role in relation to the cognition of negation.

7 We also notice that this difference of the two cultures should be shown more empirically in the future research.

8 McNeill (2005: 137f.) mentions two kinds of speech-gesture mismatches. In the first kind of mismatch, speech and gesture do not form a single idea unit that he terms the “growth point” (see McNeill 2000 and McNeill & Duncan 2000); in the second kind of mismatch, an idea unit takes form on a new level. Our case seems to correspond to the second kind of mismatch in McNeill's analysis. However, there is a slight

difference between his example and ours: In his example, the iconic gestural depiction of “slugging him” co-occurred with the utterance “*it doesn’t work,*” and in this case, the utterance functions as a meta-level comment. In our case, the gesture of nodding functions at the meta-level.

9 However, according to the present paper, this factor has no significance among the German participants at all. For German participants, as already seen, when answering a negative question, not the positive answer particle “*ja*” (yes), but rather the objection particle “*doch,*” is used; this objection particle is related to the assumption of the questioner.

10 On the other hand, weak head shaking normally co-occurs with an expression of negative proposition among Japanese speakers. Therefore, we can assume that the difference between strong and weak head shaking gestures is somewhat relevant among Japanese speakers, whereas among German speakers, it seems to play a relatively minor role.

11 As observed earlier, weak head shaking tends to occur after strong head shaking and co-occurs with propositional negation, that is, a negative particle. This co-occurrence can be explained as an expression of a more abstract negation of proposition through a more abstract gesture of weak head shaking, where the bodily origin of this gesture is not apparent any more.

12 In addition to the bodily-based explanations, a sociocultural explanation about the origin of this gesture is also suggested. Jakobson (1972: 92) confirms the similarity between nodding and the welcoming ritual and writes as follows: “The movement of the head forward and down is an obvious visual representation of bowing before the demand, wish, suggestion, or opinion of the other participant in the conversation, and it symbolizes the obedient readiness for an affirmative answer to a positively-worded question.”

13 However, Jakobson (1972) points out that the gestures of “*yes*” and “*no*” are not always universal by showing that there are languages where the other gestures, including the reverse coding of these gestures, are used for the expression of these meanings.

14 Investigations of head shaking and nodding were not included in their study. In addition, only a few gestures among those examined by them are used in Japanese. The functions of these gestures also differ by culture. For example, in Japan, the ring gesture indicates money and the pulling down of one of lower eyelids to show its undersurface indicates contempt or refusal, but this is not the case in Europe.

15 As a head gesture of negation, Morris et al. (1979) deals with the head toss, in which the head is quickly tossed backward.

16 In Japanese, hand waving is sometimes used as a gesture of negation. However, this gesture also seems to be used in situations where negation is stressed and the negative connotation is more pronounced.

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