

A Descriptive Framework for Translating Speaker's Meaning

- Towards a Dialogue Translation System between Japanese and English -

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Abstract

A framework for translating speaker's meaning or intention is proposed based on two notions, Illocutionary Force Types (IFTs) for analysis and Decision Parameters (DPs) for generation. IFTs are a certain kind of classification of utterances concerning speaker's meaning. DPs present background information of language use in order to derive an appropriate expression from speaker's meaning. In Japanese, IFTs can be derived automatically through syntactical constraints. To generate appropriate expressions, language-specific communication strategies related to DP values should be given a priori. The whole process is performed in a unification-based framework.

1. Introduction

In devising a machine translation system of telephone dialogues, one of the problems is how to adequately translate the underlying meaning of the source utterance, or the speaker's intention, into the target language. Such a concern is rarely observed in conventional machine translation research, which has focused on strictly grammatical translation divorced from consideration of the speaker's situation and intentions (Tsuji and Nagao 1988). However, in dialogue, smoothness of communication depends on perceiving the speaker's intention. Especially when dealing with different language family pairs such as Japanese and English, it is necessary to have a methodology of treating language-specific communication strategies in a universal framework.

Although the input of our machine translation system is spoken dialogue, here we leave aside the issues of speech processing and limit our discussion to linguistic processing. Extra-grammatical sentence patterns such as intra-

sentential correction, stammering, and inversion are not treated either. Our framework for translating speaker's intention is based on two notions, Illocutionary Force Types (IFTs), *i.e.* a classification of the speaker's intentions, and Decision Parameters (DPs), *i.e.* features representing different factors relevant to speech-act-related expressions. Though plan-based approaches to speech acts such as Allen and Perrault (1980) are ideal, too little is known in this field to apply it to actual natural language processing. Therefore, we adopt here a moderate intrasentential, syntactic method that can serve as further input to plan-based approaches.

In section 2 of this paper we discuss the relation between intention and speech-act indirectness, and call intention thus described "speaker's meaning." In section 3 we define IFTs. In section 4 we fully utilize syntactic constraints in Japanese in order to extract IFTs from input utterances. In section 5 we present DPs as strategies for expressing IFTs in the target language. Finally, we make conclusions on this framework.

2. Speaker's meaning in an utterance

2.1. What is speaker's meaning?

When the speaker utters a sentence, the hearer receives communicative signs in addition to propositional content. According to speech act theory, these signs are classified as illocutionary forces governed by certain felicity conditions (Searle 1969). Speech act theory is one of the main themes of pragmatics, but it remains too conceptual to be of practical assistance to natural language processing. However, illocutionary forces can be useful to machine translation if propositional content is distinguished from structure in the analysis of intention.

We begin by noting that intentions and surface expressions have multiple correspondences. As the following example shows, a single surface expression can convey several intentions:

- (2-1) *gakusei waribiki wa nai no desyô ka?*
 student discount TOP exist-NOT EXPL-POL QUEST
 Isn't there a student discount?
 ↓ ↓ ↓
 REQUESTING
 COMPLAINING
 ADVISING
 CONFIRMING
 ...etc.

Conversely, the same intention can be conveyed through various surface expressions, as in the following variations of (2-1):

- REQUESTING
 ↓ ↓ ↓
- (2-2) *gakusei waribiki o site kudasai.*
 student discount OBJ make do-GIVFAV-POL-IMP
 Please make me a student discount.
- (2-3) *gakusei waribiki o site itadaki tai nodesu ga.*
 student discount OBJ make do-RECFAV-POL want
 EXPPL-POL MODER
 I wonder if you could make me a student discount.
- (2-4) *watasi wa gakusei na no desu ga.*
 I TOP student COPL EXPL-POL MODER
 I am a student, you know.

N.B. Concerning a 'discount' request, (2-2) seems a bit strong for a real situation although there is no specific contextual condition to decide definitely if it is or not. (2-1) (2-3) and (2-4) are seen in our data.

These examples clearly show that intention is context-dependent, and that to understand the speaker's meaning correctly, an inference mechanism is necessary.

Various surface expression patterns give clues for ascertaining illocutionary forces (Wierzbicka 1986).

- (2-5) *tôrokuyôsi o o-okuri negae masu ka?*
 registration form OBJ send-POL desire POL QUEST
 Can you please send me a registration form?
- (2-6) *Could you kindly send them all together?*

Negau in (2-5), a verb for request, and *ka*, the sentence-final particle of questions, indicate request. *Kindly* in (2-6) signals a request in English. In other words, even without knowledge of the context of an utterance, knowledge of communicative strategies of language and their

expression patterns allow the derivation of intentions from utterances.

In the above examples, we can see there are various ways of expressing requests. This indirectness derives from social patterns in requesting things common to all cultures to some degree. On the other hand, however, it depends on each specific society. In this paper we accept indirectness as an unavoidable and basic feature of spoken utterances, and deal with indirect patterns such in (2-1) and (2-3) that will be called *speech-act indirectness*. Indirect expressions such as (2-4), which are called *propositional indirectness*, are not treated for the reason given in the next subsection. We use the term *speaker's meaning* to refer to intention expressed by speech-act indirectness. Using this notion, we try to capture syntactically the major portion of speech-act-related expressions in spoken Japanese.

2.2. Translation of speaker's meaning

We assume that for machine translation it is sufficient to understand utterances on the level of speech-act indirectness, without referring to propositional indirectness. On the one hand, when there is a large degree of indirectness such as the omission of propositional content in (2-4) where the topic "discount fee for students" is not actually mentioned, we must be content with a direct translation of what has been stated. This is because a sentence-based translation cannot compensate for the missing content. In addition, since the hearer will no doubt be able to infer something about the omitted content anyway, the speaker is best served by a direct translation closest to the original. On the other hand, when the propositional content is explicitly phrased but requires indirectness to make an appropriate translation into the target language, a system that concentrates on speech-act indirectness will again be the most useful, because socio-linguistic differences will be expressed typically in speech-act indirectness as in (2-1) and (2-3). Consequently, we develop a framework aimed at extracting speaker's meaning in terms of speech-act indirectness.

3. IFT's

3.1. Classification of IFT's

An experiment has been carried out on collected data of spoken-style inter-terminal dialogues to extract illocutionary acts. The subject of the conversations was limited to

application for an international conference, and the content was mainly on inquiry, request, and confirmation about the conference between a secretary and an applicant.

We classify surface IFTs into six types (Table 1). This is the immediate result of the analysis made intrasententially by means of Head-Driven Phrase Structure Grammar (HPSG)/Japanese Phrase Structure Grammar (JPSG). The six types are differentiated from each other only by means of the uppermost predicate value that is the result of the surface-based analysis. For example, an indirect request with an interrogative sentence pattern such as

(2-5) *tōrokuyōsi o o-okuri negae masu ka?*
 Could you please send me a registration form?

is classified simply as an INTERROGATIVE type, though it is OPTATIVE at the deep IFT level. Also, a sentence with an active, present-tense verb such as

(3-1) *tōrokuyōsi o o-okuri si masu*
 registration form OBJ send-POL do-POL
 I will send you a registration form.

is analyzed as INFORMATIVE, though it is PROMISE at the deep level.

Table 1. Surface IFTs

surface IFT	instances	surface predicate value
EXPRESSIVE	<i>arigatō</i> (thanks) <i>sumimasen</i> (sorry)	<i>arigatō</i> - THANKS, etc.
PHATIC	<i>mosimosi</i> (hello) <i>sayōnara</i> (goodbye)	<i>mosimosi</i> - HELLO, etc.
OPTATIVE	<i>negau</i> (wish) <i>kudasai</i> (please)	<i>x</i> -REQUEST
INTERROGATIVE	<i>ka, ne</i>	QUESTIONIF QUESTIONREF
SUBJECTIVE	<i>tai</i> (want) <i>hosii</i> (want...to)	<i>x</i> -WISH
INFORMATIVE	various	S-INFORM

3.2. Unification-based analysis

Figure 1 diagrams an overview of the procedure for translating speaker's meaning. In contrast to a conventional machine translation procedure, speaker's meaning can be analyzed and generated, without passing through transfer, by means of IFTs and DPs. Here, we do not pursue machine translation problems concerning propositional content. The processing of speaker's meaning consists of two stages,

unification-based syntactico-semantic analysis and plan inference. We will now give a more precise description of these two stages.

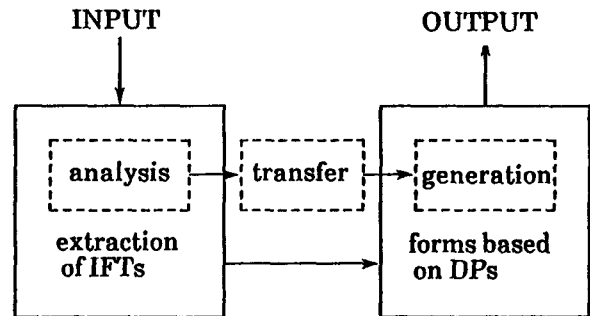


Figure 1. Speaker's meaning translation procedure

As a grammar for surface-level analysis, we have adopted HPSG (Pollard and Sag 1987) and JSPG (Gunji 1987), that is a modification of the former for dealing with Japanese. On the basis of a unification parser developed at ATR (Kogure *et al.* 1988), the grammar has been written and proven capable of analyzing all fundamental sentence patterns in spoken-style Japanese conversation (Yoshimoto, Kogure and Iida 1989).

This grammar analyzes sentence (3-2) as (3-3) by means of syntactic rules and lexical descriptions, of which only those for the subsidiary verb *morau* are given as (3-4).

(3-2) *tōrokuyōsi o okutte morae masu ka?*
 registration form OBJ send RECFV-POSS POL QUEST
 (lit.) Could I have the favor of your sending me a registration form?

(3-3)

```
[[SEM [[RELN QUESTIONIF]
  [AGEN ?SP]
  [RECP ?HR]
  [OBJE [[RELN RARERU-POSSIBLE]
    [OBJE [[MORAU-RECEIVE-FAVOR]
      [AGEN ?X1]
      [ORIG ?X2]
      [OBJE [[RELN OKURU-1]
        [AGEN ?X2]
        [RECP ?X1]
        [OBJE TōROKUYōSI']]]]]]]]]]
[SLASH [[HEAD [[POS P][FORM GA][GRF SUBJ]]]
  [SUBCAT ()]
  [SEM ?X1]]
  [[HEAD [[POS P][FORM NI][GRF OBJ2]]]
  [SUBCAT ()]
  [SEM ?X2]]]]]
[PRAG [[[SPEAKER ?SP]
  [HEARER ?HR]
  [RESTRS [[[RELN EMPATHY-DEGREE]
    [STAN ?SP]
    [MORE ?X1]
    [LESS ?X2]]]
  [[RELN POLITE]
  [AGEN ?SP]
  [OBJE ?HR]]]]]]]]]
```

(3-4)

```
(DEFLEX mora V ()
[[HEAD [[POS V]
  [CTYPE CONS-UV]
  [CFORM STEM]
  [MODL [[DONT BEND]]]]]
[SUBCAT ([[HEAD [[POS P]
  [FORM GA]
  [GRF SUBJ]]]
  [SUBCAT {}]
  [SEM ?X1]]
[[HEAD [[POS P]
  [FORM N1]
  [GRF OBJ2]]]
  [SUBCAT {}]
  [SEM ?X2]]
[[HEAD [[POS V]
  [CFORM TE]
  [MODL [[DEAC PASS][ASPC PROG]
  [DONT BENO]] IOPTT-]]]
  [SUBCAT ([[HEAD [[POS P]
  [FORM GA]
  [GRF SUBJ]]]
  [SUBCAT {}]
  [SEM ?X2]]]
  [SEM ?SEM]]])]
[SEM [[RELN MORAU-RECEIVE-FAVOR]
  [AGEN ?X1]
  [RECP ?X2]
  [OBJE ?SEM]]]
[PRAG [[SPEAKER ?SPEAKER]
  [HEARER ?HEARER]
  [RESTRS ([[RELN EMPATHY-DEGREE]
  [STAN ?SPEAKER]
  [MORE ?X1]
  [LESS ?X2]]]]]]])
```

'?' is a prefix for a tag name representing a token identity of feature structures. In (3-4), the third member of the SUBCAT value specifies the conjugational form and modality type of the complement verb. The feature MODL imposes conditions on the modality type that plays a key role in Japanese syntax by dominating mutual predicate component subcategorization and subordination. In order to handle the unorderedness of Japanese case phrases, the SUBCAT value is a set, following JPSG, instead of an ordered list in the HPSG for English. The set is expanded by a rule reader into its corresponding possible ordered list descriptions. Since Japanese case phrases are always postposed by a case-indicator, they are assigned to the part-of-speech category P. The PRAG feature stipulates here that the speaker empathizes more with the subject (?X1 in (3-4)) than with the indirect object (?X2).

This pragmatic information is further utilized with a discourse model to identify omitted subjects and objects, because they are mostly omitted in honorific or empathy-related sentences.

4. Identification of IFT's

The surface analysis result such as (3-3) serves as an input to plan schemata called IFT-Schemata that identify deep IFTs (or merely IFTs) syntactically by means of predicate-internal collocation, adjunction, tense, and modal information. An IFT-Schema consists of a goal whose value is a partial description of a deep IFT, and a decomposition whose value is a disjunction of partial descriptions of surface IFTs, preconditions, and effects as in (4-1), (4-2) and (4-3). A surface IFT is searched for which unifies with one of the descriptions in the decomposition. The goal in the same schema is the resulting deep IFT. Adoption of the unification method enables bi-directional flow of information between the deep speech act type and the decomposition. This leads to an easier disambiguation and supplementation of surface analysis results by linguistically specifying IFTs (Kogure *et al.* 1988).

The difference between surface analyses and deep IFTs is absorbed by a "thesaurus", as in (4-4), that relates the two. This specifies that MORAU-RECEIVE-FAVOR is a subtype of RECEIVE-FAVOR. (4-5) is the result of the IFT inference.

(4-1)

```
(DEF-IFT-SCHEMA ?REQ[[RELN REQUEST]
  [AGEN ?SP]
  [RECP ?HR]
  [OBJE ?OBJ[[AGEN ?HR]]]
  [MANN INDIRECTLY]
  [ATTD INTERROGATIVELY]]
:DECOMPOSITION
  (:MORAE MASE N KA, ITADAKE MASE N KA
  [[RELN QUESTIONIF]
  [AGEN ?HR]
  [RECP ?SP]
  [OBJE [[RELN NEGATION]
  [TENSE PRESENT]
  [OBJE [[RELN POSSIBLE]
  [AGEN ?SP]
  [OBJE [[RELN RECEIVE-FAVOR]
  [AGEN ?SP]
  [SOUR ?HR]
  [OBJE ?OBJ]]]]]]]]]
;NEGAE MASU KA
[[RELN QUESTIONIF]
  [AGEN ?HR]
  [RECP ?SP]
  [OBJE [[RELN POSSIBLE]
  [TENSE PRESENT]
  [AGEN ?SP]
  [OBJE [[RELN REQUEST]
  [AGEN ?SP]
  [RECP ?HR]
  [OBJE ?OBJ]]]]]]]
...)
```

(4-2)

```
(DEF-IFT-SCHEMA ?REQ[[RELN REQUEST]
      [AGEN ?SP]
      [RECP ?HR]
      [OBJE ?OBJ[[AGEN ?HR]]]
      [MANN INDIRECTLY]
      [ATTD DECLARATIVELY]]
:DECOMPOSITIONS
(:MORAI TAI NO DESU GA,
:ITADAKI TAI NO DESU GA
[[RELN S-INFORM]
 [OBJE [[RELN MODERATE]
      [OBJE [[RELN DESIRE]
            [TENSE PRESENT]
            [EXPR ?SP]
            [OBJE [[RELN RECEIVE-FAVOR]
                  [AGEN ?SP]
                  [SOUR ?HR]
                  [OBJE ?OBJ]]]]]]]]
... )
```

(4-3)

```
(DEF-IFT-SCHEMA ?REQ[[RELN REQUEST]
      [AGEN ?SP]
      [RECP ?HR]
      [OBJE ?OBJ[[AGEN ?HR]]]
      [MANN DIRECTLY]
      [ATTD DECLARATIVELY]]
:DECOMPOSITIONS
(:KURE, KUDASAI
[[RELN REQUEST]
 [AGEN ?SP]
 [SOUR ?HR]
 [OBJE ?OBJ]]
... )
```

(4-4)

```
(RELATION-IS-A MORAU-RECEIVE-FAVOR RECEIVE-FAVOR)
(RELATION-IS-A ITADAKU-RECEIVE-FAVOR RECEIVE-FAVOR)
(RELATION-IS-A KA-QUESTIONIF INFORMIF)
(RELATION-IS-A RARERU-POSSIBLE POSSIBLE)
(RELATION-IS-A DEKIRU-POSSIBLE POSSIBLE)
...
```

By this mechanism, the IFT of sentence (3-2) is inferred as (4-5).

(4-5)

```
[[RELN REQUEST]
 [AGEN ?SP]
 [RECP ?HR]
 [OBJE [[RELN OKURU-1]
      [AGEN ?HR]
      [RECP ?SP]
      [OBJE TÔROKUYÔSI']
 [MANN INDIRECTLY]
 [ATTD INTERROGATIVELY]]
```

In identifying deep IFTs, syntactic constraints in Japanese are fully utilized.

On the one hand, IFTs SUBJECTIVE and OPTATIVE are universally limited to expressions with first person singular subject and present tense and without modal information,

and Japanese surface predicates reflect these restrictions very well. Also, OPTATIVE is limited to second person recipient. For example,

(4-6) \emptyset SBJ *kaigi ni môsikomi tai.*

conference OBJ2 reserve want
I would like to register for the conference.

(4-7) \emptyset SBJ *kaigi ni môsikomi tai sô da.*

conference OBJ2 reserve want I-hear
I hear (someone) wants to register for the conference.

While sentence (4-6) with the present, non-modal auxiliary *tai* (want to) belongs to the SUBJECTIVE type, (4-7) with the evidential modality belongs to the ASSERTIVE type. This fact is utilized, by means of two lexical descriptions of *tai* and IFT-Schemata restricting the decomposition members' person, tense, and modal information, to identify the omitted subject of (4-6) as the first person, and that of (4-7) as the third person.

On the other hand, adverbials that exclusively modify deep IFTs are also utilized in disambiguating IFTs. For example, a sentence with *o-negai simasu* (request, implore) is ambiguous among OPTATIVE, ASSERTIVE and PROMISE. If it is modified by *dôzo* (please) however, the sentence is always an OPTATIVE type.

Deep IFTs with their corresponding syntactic constraints are diagrammed by Table 2. Instances in the Table indicate each of the corresponding deep IFTs, but the opposite is not necessarily true. For example, a deep IFT OPTATIVE can be indicated by complex predicates that belong to the surface category INTERROGATIVE or ASSERTIVE. Table 3 illustrates the relation between the deep IFT OPTATIVE and its corresponding surface IFT with instances.

Table 2. Deep IFTs and Constraints (Part)

surface IFT	syntactic constraints	adjuncts
EXPRESSIVE		<i>dômo</i>
OPTATIVE	1st pers., sing. sbj. 2nd person obj2 present, non-modal	<i>dôzo, dôka,</i> <i>sumimaseen</i> (<i>ga</i>)
INTERROGATIVE		<i>ittai,</i> <i>somosomo</i>
SUBJECTIVE	1st pers., sing. sbj. present, non-modal	<i>zehi</i>

Table 3. Surface Expressions for Deep OPTATIVE

surface IFT	instances with literal translation
OPTATIVE	... <i>te hosii n desu ga</i> (I would like you to...) <i>o-negai si masu</i> (I request you to...)
INTERROGATIVE	... <i>te kure masu ka?</i> (will you do me the favor of...) ... <i>te kure masen ka?</i> (won't you do me the favor of...?) <i>te morae masu ka?</i> (can I receive the favor of...?)
SUBJECTIVE	... <i>tai n desu ga</i> (I would like to...) ... <i>te morai tai n desu ga</i> (I'd like to receive the favor of...)
ASSERTIVE	... <i>te morai masu</i> (I will receive the favor of...) ... <i>to arigatai n desu ga</i> (I would be happy if you...)

By so specifying the IFT, information absent in surface utterances such as zero anaphora are compensated for and in some cases multiple analyses are disambiguated. (3-3), the surface analysis of (3-2), is analyzed as (4-5). This enables an adequate English translation (4-8) instead of an inappropriate literal translation (4-9). Note that at the same time the subject and indirect object missing in the surface sentence are compensated for by the IFT specification of the agent and recipient.

(4-8) *Could you send me a registration form?*

(4-9) **Can I receive a favor of your sending me a registration form?*

5. DP's

5.1. Necessity of DP's

We can summarize the difference between Japanese and English communication behavior as follows:

Japanese interpersonal relation is the most essential factor

English interpersonal relation is essential, but how to convey or read intentions is more important

For example, (5-1) is an utterance from a boss to a secretary to request him to work overtime. This Japanese utterance is not an order because it is expressed in a polite way using the negative interrogative. This kind of request is not unusual in Japanese because of the priority given to social standing. Because Japanese think a request phrased like this is normal, the English translation shown in (5-1) using *can* and *sorry* seems appropriate to them, too. But actually an appropriate translation requires a more polite expression that addresses the secretary's inconvenience, as in (5-1)'. Thus, to get an appropriate translation of (5-1), we must reconsider from the viewpoint of the target language interpersonal relations between the speaker and the hearer and the inconvenience of requested action for the hearer.

(5-1) *sumanaiga, zangyô site syorui o*
sorry work overtime documents OBJ
taipu site kure nai ka na?
type do-GIVFEV NEG QUEST
Sorry, but can you stay late to type these documents?

(5-1)' *Do you think you could possibly stay late to type these documents?*

To resolve these communicative differences between Japanese and English, we assume four kinds of parameterized factors, which we call Decision Parameters (DPs). These are: *interpersonal relation*, *cost-benefit relation*, *definiteness of propositional content*, and *topicality of propositional content*. Interpersonal relation indicates the situational relationship between utterance participants as constituted by age, social status, familiarity, gender, and the other factors governing use of Japanese honorifics. Cost-benefit relation indicates whether the action intended by the speaker's utterance is convenient to the speaker or to the hearer. Definiteness of propositional content means whether propositional content is routine or easily performed work, or whether it requires additional or unusual work. Topicality of propositional content is related to the position of an utterance in discourse, which means whether or not the speaker's intention is already implied.

Table 4 shows these four parameters and their values. In particular, DP4 or topicality presents discourse information which affects the politeness level of surface expressions. In the present experimental situation, extraction of speaker's meaning is limited to isolated utterances separate from discourse structure, but

to get appropriate expressions in generation, we need DP4 in connection with a discourse model.

Table 4. DPs and values

DPs	Values
1 interpersonal relation	authority in HR / a. in SP / Equal
2 cost-benefit relation	convenient for HR / c. for SP / No Mark
3 definiteness of propositional content	ROUTine / UNuSual
4 topicality of propositional content	+ / -

5.2. Selection of surface IFT by referring to DP values

In the plan inference method of generation, we use DPs in order to get appropriate English surface IFTs to convey IFTs in English. Since we are limiting the input to a task-oriented domain like conferences, we can re-state input in terms of propositional content. This propositional content is then measured in terms of the three DP values as a default (Table 5).

Table 5. Default values of DPs

Propositional Content	DP1	DP2	DP3
[A] Request (from a client to a secretary)*			
(1) send a registration form	HR	SP	ROU
(2) inform about the conference	HR	SP	ROU
(3) assist a hotel accomodation	HR	SP	ROU
(4) provide an interpreter	HR	SP	UNS
(5) give a student discount	HR	SP	UNS
(6) reimburse a fee	HR	SP	UNS
(7) come for to the station	HR	SP	UNS
[B] Request (from a secretary to a client)			
(8) send back the registration form	HR	SP	ROU
(9) tell one's name and address	HR	SP	ROU
(10) make a registration procedure	HR	SP	ROU
(11) pay by bank transfer	HR	SP	UNS
(12) take part in the party	HR	SP	UNS
(13) be informed about persons who wish to participate	HR	SP	UNS

*In business telephone conversations in English, the hearer is always considered to be in a higher position, even in the case of a boss to a secretary. So the value of DP1 for [A] is always HR.

We suppose that differences between Japanese and English consist in the different amount of DPs we should refer to when extracting surface IFTs. Japanese surface IFTs will be concerned with DP1 and DP2 since Japanese expressions do not stress speaker's intention, whereas English surface IFTs will range over all four DPs and produce a larger range of appropriate translation choices.

For example, (1) and (7) of Table 5 which differ in definiteness of propositional content (i.e. routine or unusual), can be generated in the same way in Japanese, which involves only DP1 and DP2. That is,

(5-2) *tōrokuyōsi o okut-te morai tai*
 registration form OBJ send do-RECFAV want
no desu ga. ---(1)
 EXPL-POL MODER

(5-3) *eki made mukae ni hi-te morai tai*
 station LOC come for do-RECFAV want
no desu ga. ---(7)
 EXPL-POL MODER

In English, however, these propositional contents will be generated in different expressions. In case (7), to convey the unusual but really necessary 'picking up' request, an adequate expression requires more politeness.

(5-2)' *Could you send me a registration form please? ---(1)*

(5-3)' (a) *I was wondering if I could have someone pick me up at the station. ---(7)*

(b) *Would it be possible for someone to pick me up at the station, please? ---(7)*

With reference to discourse information, DP4, the appropriate English surface IFT will be graded up or down depending on its position in the discourse. The mapping from Japanese surface IFT to English surface IFT is schematized as in Table 6. We can categorize English request expressions into two kinds. One is direct expressions with *please*, which we call PLEASE, and others are expressions containing several levels of politeness such as *could you...?, is it possible to...?, I am wondering*, etc., which we call PLEASE-PLUS. Japanese surface IFTs are separated into two types, INTERROGATIVE and others, i.e. declarative requests using OPTATIVE, SUBJECTIVE or ASSERTIVE type. When a Japanese surface IFT is INTERROGATIVE as in (5-4) and (5-5), and if the IFT is already implied in preceding utterances, the English surface IFT can be

expressed simply with PLEASE type as in (5-4)' and (5-5)', otherwise it should be expressed in PLEASE-PLUS type such as several kinds of English speech-act indirectness as in (5-4)" and (5-5)". On the other hand, when the Japanese surface IFT is others such as OPTATIVE or SUBJECTIVE as in (5-2) and (5-3), and if IFT is already implied in preceding utterances, the English surface IFT should be expressed in PLEASE-PLUS as in (5-2)" and (5-3)".

Table 6. Mapping relation concerning DP4

J. surface IFT	DP4	E. surface IFT
INTERROGATIVE	+	PLEASE
	-	PLEASE-PLUS
Others	+	PLEASE-PLUS
	-	PLEASE

(5-4) *tôrokuyôsi o okut-te morae masu ka?* (1)
registration form OBJ send do-RECFAV POL QUEST

(5-4)' *...., so please send me a registration form.*

(5-4)" *Hello, is it possible to send me a registration form?*

(5-5) *eki made mukae ni ki-te morae masu ka?*(7)
station LOC come for do-RECFAV POL QUEST

(5-5)' *...., then please pick me up at the station.*

(5-5)" *I am calling you because I was wondering if you could possibly send someone to pick me up at the station.*

(5-2) *tôrokuyôsi o okut-te morai tai*
registration form OBJ send do-RECFAV want
no desu ga. ---(1)
EXPL-POL MODER

(5-2)" *...then, I would appreciate it if you could send me a registration form.*

(5-3) *eki made mukae ni ki-te morai tai*
station LOC come for do-RECFAV want
no desu ga. ---(7)
EXPL-POL MODER

(5-3)" *...so, may I ask if you could possibly have someone pick me up at the station?*

Thus, the politeness levels of English surface IFTs in terms of speech-act indirectness are appropriately generated by clarifying the relation between English surface IFTs and DPs.

6. Conclusion

We proposed in this paper a descriptive framework for translating speaker's meaning in a dialogue translation system. This framework is based on two notions, Illocutionary Force types and Decision Parameters, and is aimed at extracting speaker's meaning in terms of speech-act indirectness since we believe that propositional and speech-act indirectness must both be processed separately.

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