

Frame Integration, Head Switching, and Translation: RISK in English and Japanese

Yoko Hasegawa¹, Kyoko Hirose Ohara^{1,2,3}
Russell Lee-Goldman^{1,3}, Charles J. Fillmore^{1,3}

¹University of California, Berkeley, ²Keio University, ³International Computer Science Institute

1. INTRODUCTION

The semantic relations in multi-clausal or phrasal sentences have traditionally been characterized in such terms as ADDITIVE, CAUSE-EFFECT, CIRCUMSTANCE, CONCESSIVE, CONDITIONAL, CONTRASTIVE, MEANS-END, TEMPORAL SEQUENCE, etc. (cf. Hasegawa 1996). About two decades ago, when we were analyzing and annotating intrasentential semantic relations of a variety of Japanese texts, we encountered this sentence:

- (1) Oshoogatsu ni wa tako o agete asonda.
New Year's Day TIME TOP kite ACC fly-CONJ played/enjoyed
'On the New Year's Day we enjoyed flying a kite.'
'On the New Year's Day we flew a kite for fun.'

What is the semantic relation between *tako o ageru* 'fly a kite' and *asobu* 'play/enjoy'? Lacking an appropriate semantic relation, we reluctantly labeled it as MEANS-END, i.e. 'we enjoyed by means of flying a kite'. Since then, our knowledge of semantic analyses has been deepened and expanded, and we are now better equipped to tackle this problem. We analyze this sentence as an instance of **frame integration**. That is, *tako o ageru* indicates an activity, whereas *asobu* provides its interpretation. In this paper we will develop this idea of frame integration by examining English sentences involving the verb *risk* and their Japanese translations.¹ The theoretical framework underpinning this study is **frame semantics** (Fillmore 1976, 1992, *inter alia*) as implemented in the FrameNet project (Fillmore et al. 2003, Ruppenhofer et al. 2006, *inter alia*).

2. FRAME INTEGRATION AND HEAD-SWITCHING

Some frame-bearing lexical units (approximately equivalent to the so-called content words, vis-à-vis function words) give information about the content of a state of affairs (**content predicates**); others locate a state of affairs within some larger interpretive schema (**interpretation predicates**). As opposed to content predicates, which describe or denote events, interpretation predicates have a low level of 'direct descriptivity' (Snell-Hornby 1983). That is, rather than denoting a particular sort of action (speaking, jogging, etc.), they describe or evaluate the larger situation surrounding the action. Interpretation predicates, then, *frame* a more 'contentful' predicate within a subjective, evaluative, often speaker-oriented situation. *Create, dance, eat, laugh, read, think, walk*, for example, are all content predicates; *chance, condescend, dare, deign, insult, manage, risk* are pure interpretation predicates.

¹ Most English sentences examined in this paper are extracted from the British National Corpus, a 100 million word balanced corpus of English (for more information, see <http://www.natcorp.ox.ac.uk/>).

When the head of a clause, e.g. its main verb, is of one type, and a grammatically subordinated element is of the other type, the semantic interpretation of the clause may require *not the 'subordination' of the one to the other, but an integration of the two*. This idea of frame integration can be exemplified by sentences (2); each reports the same action (bombing the village) and locates it as part of a REVENGE frame, but these two sentences differ in which verbal appears as the main predicate to evoke the pivotal frame. We call this predicate alternation **head-switching**.

- (2) a. We *retaliated* by bombing their village.
 interpretation content
- b. We bombed their village *in retaliation*.
 content interpretation

3. THE RISK FRAME

The English verb *risk* has only an interpretive function. It expresses the likelihood of some mishap affecting the protagonist in some situation (Fillmore and Atkins 1992, 1994). When we hear, for example, that someone risked his health, we cannot know from that information alone what he actually did, but we do know that whatever he did is considered by the speaker harmful to the person's well-being. The core concepts involved in the RISK frame are:

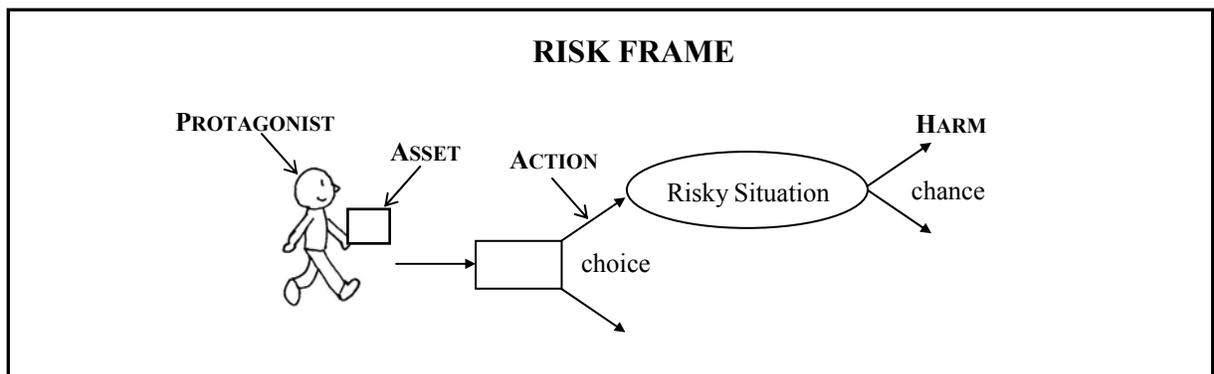


Figure 1

FRAME ELEMENTS

ACTION: the act of the PROTAGONIST that has the potential of incurring HARM (e.g. a trip into the jungle, swimming in the dark).

ASSET: a valued possession of the PROTAGONIST, seen as potentially endangered in some situation (e.g. health, income).

HARM: a potential unwelcome development coming to the PROTAGONIST (e.g. infection, losing one's job).

PROTAGONIST: the person who performs the ACTION that results in the possibility of HARM occurring.

BACKGROUND KNOWLEDGE

Chance: the uncertainty about the future.

Choice: the PROTAGONIST'S decision to do the ACTION.

Risky Situation: the state of affairs within which the ASSET might be said to be at risk.

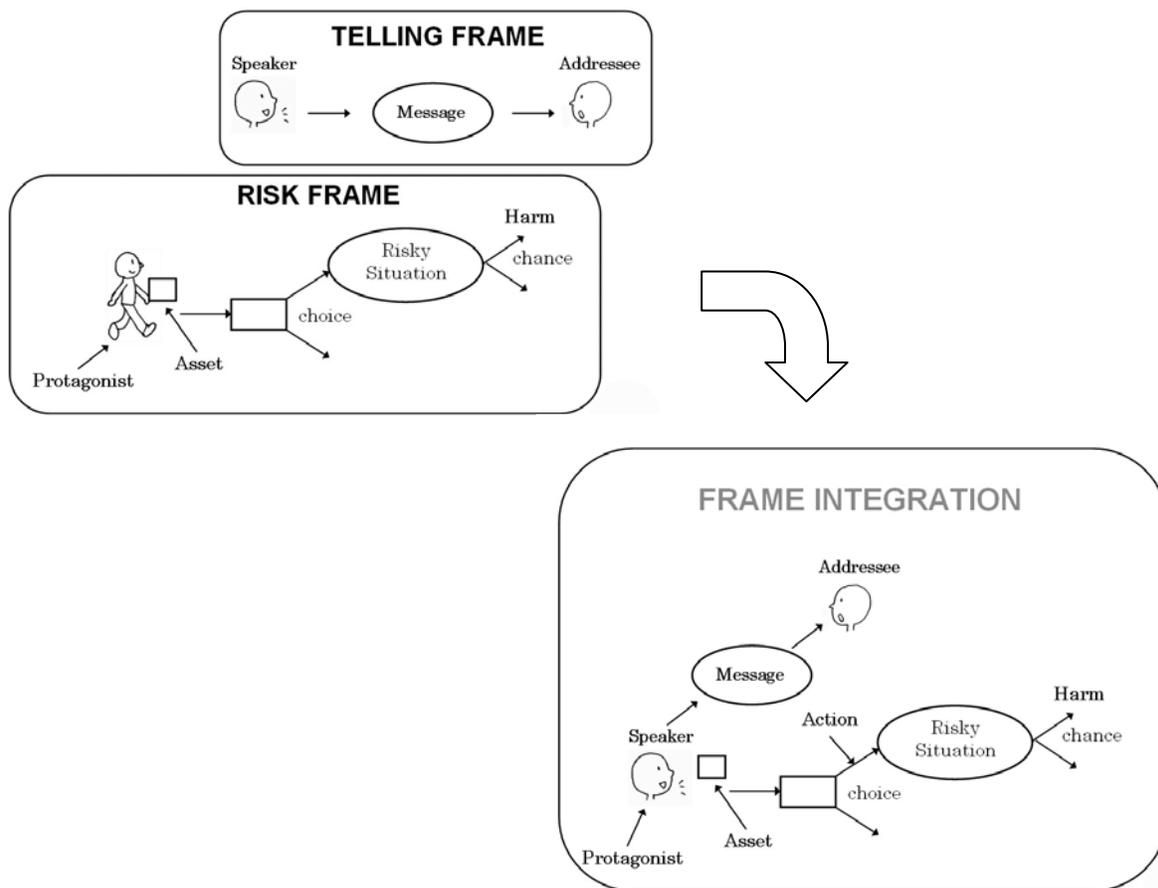


Figure 4

Being interpretive, the RISK frame is inherently integrative of content and interpretation predicates. The proposition expressed by the content predicate *constitutes* in the RISK frame the situation which is interpreted as being risky.

Its potential for head-switching makes the verb *risk* particularly appropriate for our investigation of frame integration across languages because head-switching (i.e. rephrase) is **intralingual translation** (Jakobson 1959/2000), which shares fundamental problems with **interlingual translation**.² We frequently encounter during a translation process the situation in which the target language lacks a grammatical construction equivalent to the source-language construction. In such a case, skillful translators will, consciously or unconsciously, check the possibility of head-switching. Furthermore, head switching has attracted considerable attention in recent years especially in the field of machine translation. We, therefore, examine English RISK sentences and their Japanese translations with a particular focus on head-switching in the source language first and then see if the target language has its equivalent grammatical construction.

² The third category that Jakobson proposes is **intersemiotic**, e.g. translation of a novel into a film.

4. SUB-FRAMES

The three sub-frames in the RISK family of frames are JEOPARDIZING, INCURRING, and DARING.³ In the JEOPARDIZING frame the PROTAGONIST and ASSET are foregrounded and encoded as core arguments, e.g. (4a).

- (4) a. **She** risked **her life** {by going to Iraq}. (JEOPARDIZING)
PROTAG ASSET ACTION
- b. She went to Iraq at risk to her life.

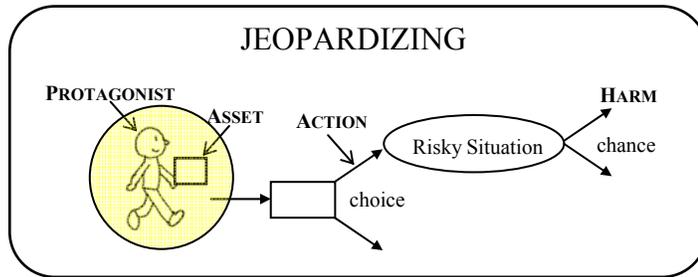


Figure 5

In the INCURRING frame, the PROTAGONIST and the HARM are foregrounded, e.g. (5a).

- (5) a. **He** risked **losing his life savings** {by investing in such a company}. (INCURRING)
PROTAG HARM ACTION
- b. He invested in such a company risking losing his life savings.

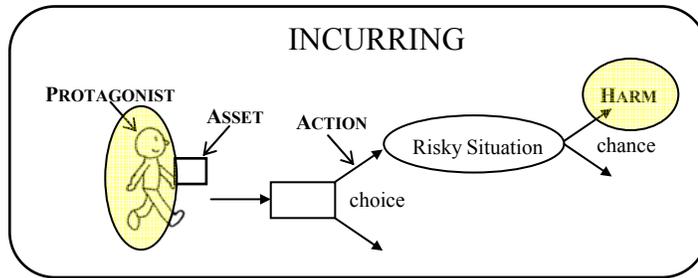


Figure 6

When the ACTION is explicitly mentioned, RISK sentences with the JEOPARDIZING or INCURRING frame normally permit head-switching, as shown in (4-5).

³ This three-way distinction is useful in discussing the different senses of *risk*. However, the current FrameNet analysis of the senses of *risk* places them in a family of frames with relation to other frames. The jeopardizing and incurring uses of *risk* are analyzed as different points of view on a generalized frame (see the RUN_RISK frame and RISKY_SITUATION frames). The daring sense of *risk* is in a separate frame, DARING, which is a subtype of an INTENTIONALLY_ACT frame.

In the DARING frame, the PROTAGONIST and the ACTION are foregrounded, e.g. (6a), although the ACTION is not encoded as a core argument.

- (6) a. **He** risked leaving the security of his home {to deliver the message}. (DARING)
PROTAG ACTION PURPOSE
- b. He *daringly* left the security of his home to deliver the message

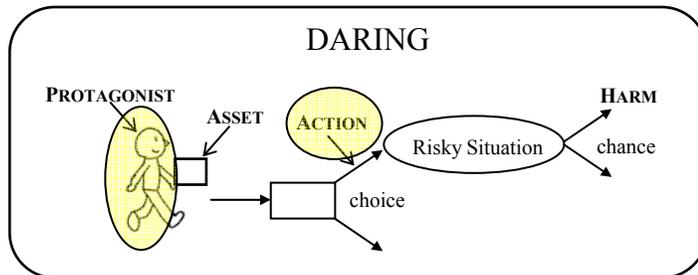


Figure 7

Note that DARING RISK sentences do not undergo head-switching in the same manner as JEOPARDIZING and INCURRING RISK sentences; *risk* is normally rephrased in a DARING RISK sentence with such an adverbial as *daringly*. Semantically, DARING RISK sentences are highly underspecified. In (6a), for example, we do not know what the risky situation that the act of leaving the security of his home might bring about. Nor can we identify what the endangered ASSET or potential HARM might be. In other words, with respect to the interpretation function, DARING RISK is the purest among the three; it provides nothing more than the speaker's judgment about the ACTION specified by the content predicate. Therefore, interpreting DARING RISK sentences thoroughly requires a significant amount of inferences and thus is highly context dependent. If the ACTION is clearly negative, e.g. (7a), we can imagine without effort many adverse consequences, and thus the interpretation is easier. However, if the ACTION is neutral, e.g. (7b), more active interpretation effort on the hearer's part becomes essential.

- (7) a. I wouldn't risk **offending my colleagues**.
 b. I wouldn't risk **waiting for her** (possibly because she is always tardy, and if they're late, they might not be able to find seats).

5. TRANSLATION INTO JAPANESE

RISK sentences frequently resist direct constructional transfer into Japanese due to complex lexicalization pattern differences between the two languages. The main noun in the Japanese RISK frame is *kiken*, and in many cases the noun *risk* can be translated as *kiken* with a little adjustment. Japanese predicates that belong in the RISK frame include *kiken o okasu/maneku*, *kiken ni sarasu*, and *kakeru*, each with different combinatory properties.

- (8) a. *Sonna kiken wa okashitakunai.*⁴
 such risk TOP not.want.to.commit
 ‘I don’t want to {take such a risk/risk doing such a thing}.’
- b. *Iranai kiken wa manekitakunai.*
 unnecessary risk TOP not.want.to.invite
 ‘I don’t want to {invite an unnecessary risk}.’
- c. *Kodomotachi no inochi o kiken ni sarashita.*
 children GEN life ACC risk to exposed
 ‘They risked the children’s lives.’
- d. *Shoobooshi wa hito no tameni inochi o kaketeiru.*
 fire fighters TOP people GEN for life ACC risk
 ‘Fire fighters risk their lives for others.’

5.1. JEOPARDIZING Frame

Sentences with the verb *risk* in the three sub-frames exhibit different characteristics when translated into Japanese. In JEOPARDIZING sentences, the PROTAGONIST is encoded as the topic/subject of the sentence; the ASSET is encoded either as the direct object NP (9a) or as the genitive NP modifying *kiken* (9b).

- (9) a. ***Kanojo wa iraku ni itte, jibun no inochi o kiken ni sarashita.***
 she TOP Iraq to go-CONJ self GEN life ACC risk to exposed
 ‘She risked her life by going to Iraq.’
- b. ***Kanojo wa inochi o kiken ni sarashite, iraku ni itta.***
 she TOP life ACC risk to expose-CONJ Iraq to went
 ‘She went to Iraq at risk to her life.’

When *kiken o maneku* is in an affirmative sentence, the subject is normally a CAUSE or MEANS, but not a sentient being. Therefore, it might be more appropriate to consider it as a complex construction *put X at risk*. In FrameNet, *put X at risk* is analyzed as having *at risk* in the BEING_AT_RISK frame, and *put* in the causation frame. *Put* is thus a causative support verb. Consequently, the subject of the sentence is not a frame element in the RISK frame; it is merely the Agent in a CAUSATION frame. For example: [He CAUSE] put [the children at risk EFFECT] (CAUSATION frame); He [put SUPPORT-VERB] [the children ASSET] at risk (RISK frame).

- (10) They know that, unless I am very fortunate, the only chance I’ll have to catch them is the moment in which they take the ransom, and they know equally well that you won’t <risk> your daughter’s life by telling me where that’s going to happen.

⁴ ACC=accusative, CONJ=conjunctive particle, COP=copula, GEN=genitive, NMLZ=nominalizer, SFP=sentence final particle, QUOT=quotative, TOP=topic.

a. Anata ga watashi ni sono basho o oshiete, musume no inochi o
 you NOM me to that place ACC tell-CONJ daughter GEN life ACC
 kiken ni sarashitarishinai koto mo ne.
 risk to not.expose NMLZ also SFP

b. Anata ga musume no inochi o kiken ni sarashite made, watashi
 you NOM daughter GEN life ACC risk to expose-CONJ even me
 ni sono basho o oshietarishinai koto mo ne.
 to that place ACC tell-not NMLZ also SFP

(11) But what has this to do with Mr. Andrew? “Nothing,” I said. “I am simply making conversation while I decide whether to <risk> my job by telling you things that I certainly ought not to tell you.” “Don’t then,” she said.

a. Watashi wa tada, oshieru bekidenai koto o itte, jibun no shigoto
 I TOP just ought.not.to.tell thing ACC tell-CONJ self’s.job
 o kiken ni sarasu ka doo ka kesshin suru made no tsunagi
 ACC risk to expose whether.or.not decide until GEN to.fill.up.gap
 ni shabetteiru dake desu yo.
 for speaking only COP SFP

b. Watashi wa tada, jibun no shigoto o kiken ni sarasite made,
 I TOP just self’s.job ACC risk to expose-CONJ even
 oshieru beki de nai koto o iu ka doo ka kesshin suru made no
 ought.not.to.tell thing ACC tell whether-or-not decide until GEN
 tsunagi ni shabetteiru dake desu yo.
 to.fill.up.gap for speaking only COP SFP

JEOPARDIZING sentences normally permit head-switching alternatives, as shown in (9-11). However, while subordinating the RISK concept (b-sentences) is always possible, expressing it as the main predicate is sometimes impossible or unnatural, e.g. (12a, 13a).

(12) “I’ve lived in the mountains,” he said grimly. “I’ve seen what can happen to fools. I’ve also seen what can happen to the poor brave souls who <risk> their own lives searching for them.” He eyed her contemptuously.

a. ? Sooiu orokamono o soosaku ni itte mizukara no inochi o kiken
 such fool ACC search to go-CONJ self’s life ACC risk
 ni sarasu, yuukanna hitotachi no ki no doku na matsuro mo.
 to expose brave people GEN pity end too

b. Mizukara no inochi o kiken ni sarasite made, sooiu orokamono o
 self’s life ACC risk to expose-CONJ even such fool ACC
 soosaku ni iku, yuukanna hitotachi no ki no doku na matsuro mo.
 search to go brave people GEN pity end too

(13) Fire-fighters <risked> their lives yesterday searching for two suspected young arsonists believed to be trapped inside a blazing school building.

a. ? Shoobooshi-tachi wa moesakaru koosha ni tojikomerareta, hookahan to
 fire.fighters TOP blazing school in trapped arsonist QUOT
 mirareru futarino shoonen o soosaku shite, mizukara no inochi o kiken
 suspected two boy ACC search-CONJ self's life ACC risk
 ni sarashita.
 to exposed

b. Shoobooshi-tachi wa mizukara no inochi o kiken ni sarashi, moesakaru
 fire.fighters TOP self's life ACC risk to expose blazing
 koosha ni tojikomerareta, hookahan to mirareru futarino shoonen o
 school in trapped arsonist QUOT suspected two boy ACC
 soosaku shita,
 searched

5.2. INCURRING Frame

In INCURRING sentences, the PROTAGONIST appears as the topic/subject, and the HARM as an embedded clause modifying *kiken*, e.g. (14-16).

(14) A young cancer victim whose mother refused him treatment because he was too weak will be at home for the Christmas he thought he would never see. Daniel Stoneman has defied the doctors who gave him a one-in-10 chance of survival from a rare brain tumour. His mother Angela had <risked> legal action by blocking radiation treatment — saying she would rather her son died in peace at home than suffer in hospital. Now Daniel, 10, appears to have made a remarkable recovery with just chemotherapy treatment and cancer tablets.

a. ? Kare no haha, anjera wa, hooshasen-chiryoo o kyohishi, uttaerareru kiken
 his.mother Angela TOP radiation.treatment ACC reject be.sued risk
 o okashita.
 ACC committed

b. Kare no haha, anjera wa, uttaerareru kiken o okashi, hooshasen-chiryoo
 his.mother Angela TOP be.sued risk ACC commit radiation.treatment
 o kyohishita.
 ACC rejected

(15) Around a hundred homosexual couples will <risk> arrest tonight by gathering in London's Picadilly Circus for a kiss-in. The demonstration arranged by the Lesbian and Gay Direct Action Group, OUTRAGE, is to challenge public decency laws which it claims are being misinterpreted to criminalise public shows of affection between gay couples.

- a. ? Yaku 100-kumi no dooseiaisha kappuru wa kon'ya rondon no
 about 100 homosexual couple TOP tonight London GEN
 pikaderii saakasu no kisu-in ni sanku shi, taiho-sareru kiken o okasu.
 Picadilly.Circus GEN kiss-in to join be.arrested risk ACC commit
- b. Yaku 100-kumi no dooseiaisha kappuru wa kon'ya taiho-sareru kiken o
 about 100 homosexual couple TOP tonight be.arrested risk ACC
 okashi, rondon no pikaderii saakasu no kisu-in ni sanku suru.
 commit London GEN Picadilly.Circus GEN kiss-in to join

(16) But across the Atlantic the news stunned the British government. Reagan was their great friend and ally, with whom they had this supposed special relationship and who shared Mrs Thatcher's much-publicised belief that no deals of any kind should be made with terrorists or governments that supported terrorism. Indeed, Mrs Thatcher had <risked> her personal reputation by allowing American F-111 aircraft to attack Libya from British bases in April 1986.

- a. ? Satchaa fujin wa 1986-nen 4-gatsu, amerika no F111-ki no
 Mrs Thatcher TOP year.1986 April America GEN F-111.aircraft GEN
 eikoku kichi kara no ribia bakugeki o kyoka shi, jibun no meisei o
 British.base from GEN Libya attack ACC allow self's.reputation ACC
 kizutsukeru kiken o okashita.
 hurt risk ACC committed
- b. Satchaa fujin wa 1986-nen 4-gatsu, jibun no meisei o kizutsukeru kiken
 Mrs Thatcher TOP year.1986 April self's.reputation ACC hurt risk
 o okashite amerika no F111-ki no eikoku kichi kara no
 ACC commit-CONJ America GEN F-111.aircraft GEN British.base from GEN
 ribia bakugeki o kyoka shita.
 Libya attack ACC allowed

As shown in the a-sentences in (14-16), INCURRING RISK sentences do not accommodate head-switching well; a-sentences can be used appropriately only when the decision to take a risky action becomes the topic of succeeding sentences, rather than the risky action itself. For example, in (14), if the following sentence were instead *She was brave* or *As things turned out, it was a wise decision*, (14a) would be appropriate. Like JEOPARDIZING RISK sentences, expressing the notion of RISK as a syntactically subordinated construction sounds more authentic in INCURRING RISK sentences in Japanese.

5.3. DARING Frame

DARING RISK sentences in Japanese normally do not express the concept of RISK as a predicate but only as such adverbials as *aete* 'dare', *omoikitte* 'dare', and *osorezuni* 'fearlessly' subordinated to the verb, e.g. (17-19).

(17) a. *Watashi wa hitomae de wa sonna hanashikata o suru kiken wa
 I TOP in.public such way of talking ACC do risk TOP
 okasanai.
 commit.not
 ‘I wouldn’t risk talking like that in public.’

b. Watashi wa hitomae de wa aete, sonna hanashikata wa shinai.
 I TOP in public daringly such way of talking TOP do.not
 ‘(Lit.) I wouldn’t talk like that in public daringly.’

(18) ‘What do you mean by that?’ She looked away, made uneasy by the threatening expression on his harsh features. Why on earth had she <risked> provoking him? ‘Only that you seem to be the darling of the tabloids,’ she muttered.

Ittai naze kanojo wa aete kare o okoraseru yoona koto o shita
 why.on.earth she TOP daringly he ACC make.angry thing ACC did
 no daroo.
 NMLZ I.wonder

(19) Now there was the kind of silence one gets in the middle of a windy night before an increase to gale force. Miss Green, having taken Hubert’s advice, looked up at her host. Flora, sensing that nobody would be looking her way, <risked> looking up. All around fellow diners hushed.

Furoora wa dare mo miteinai to kanjita node, omoikitte kao o
 Flora TOP no.one is.watching QUOT felt because daringly face ACC
 agetemita.
 moved.up

When the HARM can easily be inferable, it is more natural not to translate *risk*.

(20) “I shall wear my hair how I please.” “Not while you live with me,” he said quietly, and she couldn’t decide if he was serious or not. She glared at him, but there was too much at stake to <risk> a fight, so after a moment she pushed her hair away from her face and sat down, pulling one of the mugs towards her. “Very wise,” he said maddeningly.

Kanojo wa kare o nirami-tsuketa ga, koko de arasottewa ushinau
 she TOP he ACC glared but here at fight lose
 mono ga ookisugita.
 thing NOM too.big

(21) If you have spent a long day on the airfield, it will be difficult to refuse your turn to fly, even if you are tired. However, if you are going to fly solo, refusing is the only sensible thing to do. Flying demands all your concentration and it is not wise to <risk> flying if you have business worries or some other mental stress on your mind. Even a violent argument will leave you mentally high and quite unfit to fly.

Hikooki o soojuu suru niwa zenshinkei o shuuchuu suru hitsuyoo ga
 airplane ACC fly for all.nerve ACC concentrate necessity NOM
 ari, shigoto no mondai ya seishinteki sutoresu o kakaeteiru tokini
 exist work GEN problem and mental stress ACC have when
 tobu no wa kemmei dewanai.
 fly NMLZ TOP wise is.not

5.4. Manage

Another interpretation predicate which must be translated as an adverbial is *manage*. It belongs to the SUCCESS_OR_FAILURE frame, in which an AGENT has succeeded or failed in their attempt at achieving a GOAL. There is no predicate in Japanese that corresponds to *manage*; it can only be translated with such adverbials as *nantoka/doonika* ‘somehow’, and *karoojite* ‘barely’, with or without *dekiru* ‘be able to’.

- (22) Mary’s heart was beating fast and her hands were shaking as she pushed the leaves away and found the key-hole. She took the key out of her pocket, and it fitted the hole. Using both hands, she <managed> to unlock the door. Then she turned round to see if anyone was watching.

Kanojo wa ryote o tsukatte nantoka doa no kagi o aketa.
 she TOP both.hands ACC use-CONJ somehow door GEN lock ACC opened

- (23) The various attendants and hangers-on departed at great speed, and Abu, Lorne and I rose abruptly and began backing away into the warong. The truck-driver, on the other hand, tore across the street, through the rising blue flames, and leapt into his cab. After a few heart-stopping moments the old engine coughed into life, and he <managed> to accelerate the loaded vehicle through the flames out to safety.

Suukai no kiwadoi shukan no nochi, furui enjin wa
 a.few.times GEN dangerous moment GEN after old engine TOP
 sekikomu yoona oto o tatete shidoo shi, kare wa honoo o
 like.coughing sound ACC make-CONJ start he TOP flame ACC
 tsukkitte mansai no kuruma o doonika anzen chitai ni
 go.across-CONJ full.loaded GEN car ACC somehow safe.area to
 dasshutsu saseto.
 made.escape

- (24) On Thursday, the tranquil scene was dramatically transformed by an invasion of 20 cars and trucks and a horde of cameramen and reporters. Mrs. Clinton was greeted by a young couple who offered a bowl brimming with fermented mare's milk, a traditional nomadic drink. After a sip, Mrs. Clinton <managed> a smile. Most Westerners hate the taste, sometimes described as a cross between buttermilk and beer.

Hitokuchi nonde kurinton-fujin wa karoojite hohoenda.
 a.sip drink-CONJ Mrs. Clinton TOP barely smiled

Based on our analysis of RISK and other sentence translations, we have hypothesized that, in the case of the RISK frames, the content predicates are preferentially primary and the evaluation predicates tend to be grammatically subordinated in Japanese. However, this generalization is not applicable to all evaluation predicates. Recall sentence (1).

- (1) Oshoogatsu ni wa tako o agete asonda.
New Year's Day TIME TOP kite ACC fly-CONJ played/enjoyed
'(Lit.) On the New Year's Day we enjoyed flying a kite.'
'On the New Year's Day we flew a kite for fun.'

Here, *asobu* 'play/enjoy' is the interpretation predicate, and yet it appears as the main predicate. We will examine more interpretation predicates and investigate the causes of this discrepancy.

6. CONCLUSIONS

In a careful survey of sentences expressing the various concepts that make up the family of RISK frames as described for English, we have found clear cases illustrating differences in basic clause structure between English and Japanese. These differences suggest preferences for one or another way of selecting "head" and "subordinator" between the expression of the risk-taking action and the concept of risk itself. In the case of DARING RISK, the possibility of expressing the risk concept as a clausal head does not exist in Japanese.

In addition to DARING RISK, in translations of English verbs like *manage*, *deign*, *condescend*, and a few others, we find control verbs in English corresponding to adverbial modification in Japanese, with almost no possibility of expressing the idea in a main verb. These are phenomena that make up important differences between the two languages, which language learners and translators have to take into account.

Whether these observations can be taken as suggesting any kind of deep semantic-typological differences between English and Japanese, or whether they simply represent small insignificant corners within the meaning-space of each language is yet to be seen. Perhaps corpus investigations and translation research along the lines we have sketched out here, especially using the principles and requirements of frame semantics, will eventually make it possible to define useful ways of conducting such inquiry.

REFERENCES

- Fillmore, Charles. 1976. Frame semantics and the nature of language. *Annals of the New York Academy of Sciences: Conference on the Origin and Development of Language and Speech* 280:20-32.
- Fillmore, Charles. 1992. "Corpus linguistics" vs. "computer-aided armchair linguistics". In *Directions in Corpus Linguistics: Proceedings from a 1991 Nobel Symposium on Corpus Linguistics*, 35-66. Stockholm: Mouton de Gruyter.
- Fillmore, Charles, and Atkins, B.T.S. 1992. Toward a frame-based lexicon: The semantics of RISK and its neighbors. In *Frames, Fields and Contrasts: New Essays in Semantic and Lexical Organization*, eds. A. Lehrer and E. Kittay, 75-102. Hillsdale, New Jersey: Erlbaum.

- Fillmore, Charles, and Atkins, B.T.S. 1994. Starting where the dictionaries stop: The challenge for computational lexicography. In *Computational Approaches to the Lexicon*, eds. B. Atkins and A. Zampolli, 349-93. Oxford: Oxford University Press.
- Fillmore, Charles, Johnson, Christopher, and Petruck, Miriam. 2003. Background to Framenet. *Special Issue: FrameNet and Frame Semantics. International Journal of Lexicography* 16.3:235-50.
- Hasegawa, Yoko. 1996. *A study of Japanese clause linkage : the connective TE in Japanese*. Stanford, Calif.; Tokyo: CSLI Publications; Kurosio Publishers.
- Jakobson, Roman. 1959/2000. On linguistic aspects of translation. In *The Translation Studies Reader*, ed. Lawrence Venuti, 113-18. London; New York: Routledge.
- Ruppenhofer, Josef, Ellsworth, Michael, Petruck, Miriam, Johnson, Christopher, and Scheffczyk, Jan. 2006. FrameNet II: Extended Theory and Practice. Technical Report. Berkeley: ICSI.
- Snell-Hornby, Mary. 1983. *Verb-Descriptivity in German and English: A Contrastive Study in Semantic Fields*. Heidelberg: C. Winter Universitätsverlag.