Object-Centered vs. Event-Centered Encoding: A FrameNet Account

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In 1930 Japan, a silent movie entitled *Nani ga kanojo o soo saseta ka?* 'What made her do it?' made a sensation and achieved box-office success.

(1) *Nani   ga   kanojo   o   soo   saseta   ka.*
    what   NOM   she   ACC   so   made.to.do   Q
    'What made her do it?'

This success was due in significant part to its linguistically eccentric title; it used familiar vocabulary and familiar grammatical structure, but it juxtaposed an abstract subject (*nani* 'what') to a VP headed by a verb with causative morphology, and that just did not happen in normal Japanese. Even today, after decades of noticeable rhetorical-style changes under English influence, sentences that pile up abstract nouns, such as (2), remain peculiar to Japanese ears.

(2) *Kono   jijitsu   no   ninshiki   ga   mondai   no   kaiketsu ni   kooken-suru.*
    this   fact   GEN   awareness NOM   problem   GEN   solution DAT   contribution-do
    'The recognition of this fact will contribute to the resolution of the problem.'

(Even the denominal verb *kooken-suru*, meaning 'contribute' permits an analytic gloss as 'makes a contribution', adding another abstract noun.) A more idiomatic formulation would be along the lines of (3).

(3) *Kore   ga   wakar.eba,   mondai   wa   zutto   kaiketsu-shi.yasuku   naru.*
    this   NOM   if.understand problem   TOP   much   solution-do.easily   become
    'If we understand this, the problem will become more manageable.'

    Many Japanese grammarians have offered description of such rhetorical differences between Japanese and English, but their characterizations are sometimes so impressionistic that researchers whose native language is not Japanese find them inscrutable. Among such claims,

Ikegami (1988:9) writes that in Japanese text, "[a]n individuum is not seen in isolation; it is not clearly separated from what it stands contiguous with. It is merely a part of a larger whole, with which it may become merged to the extent of losing its identity." Incorporating Ikegami's idea, Maynard (1997:172) characterizes the same phenomenon as *scene-orientation* (as in Japanese) vs. *agent-orientation* (as in English). She contends, "[f]or Japanese people, the scene of an event as a whole assumes the primary focus of attention (in comparison to English, where the agent is the primary focus)."

This paper will try to reformulate certain claimed cognitively deep typological differences between English and Japanese as empirical hypotheses and will explore ways of testing them with data taken from parallel texts in the two languages. It will then analyze a sentence pair exhibiting characteristic differences between them using descriptive notions developed in FrameNet. The proposed explanations involve concepts of transitivity, the expression of causative relations, and the availability of both verbs and nouns for expressing events.

Let us begin our discussion with Seidensticker and Anzai's (1983) claim that English uses transitive constructions with significantly greater frequency than Japanese. To test the validity of this claim, we examined a parallel-text corpus consisting of the first several paragraphs of a number of *Scientific American* articles published between October 2005 and October 2006 and their Japanese translations published in the *Nikkei Saiensu* magazine. The corpus contains 266 English, mostly multi-clausal, sentences, accompanied by translations into Japanese created by professional translators and judged to be idiomatic Japanese.

We found that 382 English and Japanese clause-pairs agreed in transitivity (i.e. transitive or intransitive in both languages), whereas 119 clause-pairs did not.[1] That is, of all English clauses that were translated fairly straightforwardly into Japanese, approximately 75% maintained their transitivity, but 25% switched it.[2] Of the 119 unmatched clause-pairs, 99 English transitive clauses were translated into Japanese intransitive clauses, e.g. (4):[3]

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[1] Categorization between transitive and intransitive was made based on semantic, rather than morphosyntactic, criteria. *Point to*, for example, is morphosyntactically intransitive, but semantically transitive. We used paraphrasability as a diagnostic test. That is, if the predicate can be paraphrased into transitive, e.g. *point to* into *suggest*, we categorized it as transitive. To simplify our analysis, we consider passive clauses to be intransitive, although we are aware that they could be categorized as transitive because, in most cases, two entities are involved.
[2] Some clauses are either not translated at all or translated into significantly different constructions. We did not count those cases.
[3] Example sentences are simplified for expository purposes.

(4) Initially the brain can function normally as <u>it loses</u> dopaminergic neurons.

    Doopamin-sadoosei   <u>*nyuuron*</u>   <u>*ga*</u>   <u>*shooshitsu-shite*</u>   *mo*   *toosho*   *wa*

    dopaminergic   neuron   NOM   disappear   even   initially   TOP

    seijooni   *kinoo-suru.*

    normally   function

    'Even if dopaminergic neurons disappear, [the brain] functions normally at first.'

By contrast, only 20 English intransitive clauses were translated into Japanese transitive clauses, e.g. (5):

(5) Gleevec [a drug] <u>has been a huge clinical success</u>.

    Guribekku   *wa*   *rinshoo*   *no*   *ba*   *de*   <u>*ookina*   *seikoo*   *o*   *osameta.*</u>

    Gleevec   TOP   clinical   GEN   place   in   huge   success   ACC   accomplish

    'Gleevec accomplish a success in the area of clinical trials.'

The ratio of "English transitive into Japanese intransitive" vs. "English intransitive into Japanese transitive" is approximately 4:1. Therefore, as Seidensticker and Anzai claim, we conclude that transitive clauses are significantly less preferred in Japanese than in English.

The next hypothesis to consider is Ikegami's (1981) typology of *DO-language* (*suru no gengo*) vs. *BECOME-language* (*naru no gengo*). Citing Bloomfield (1933), Ikegami argues that the most favored sentence structure in English is *actor-action*, and, thus, it is a DO-language. Japanese is said to be a BECOME-language, which prefers to describe events as state-changes, rather than as actions involving actors — the defining characteristic of the DO-language.

When verifying this hypothesis using our parallel texts, we cannot simply count transitive and intransitive clauses and consider them to belong to the DO-type and the BECOME-type descriptions, respectively, because many transitive verbs indicate states (e.g. *have*, *entail*, *know*, *represent*, *suggest*) or non-agentive events (e.g. *experience*, *fail*, *lose*, *reach completion*, *undergo*). And many intransitive verbs indicate acts and processes (e.g. *function*, *pervade*, *pass through*, *run*, *work*). Therefore, we first identified predicates that denote a change of state, and then determined whether the depicted situation is a DO type or a BECOME type.[4] Sentence (6) exemplifies the former, and (7), the latter.

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[4] When the clause in question is negated, we considered the affirmative counterpart.

(6) I had built a model of a room that was part of my lab. [DO]
Watashi wa kenkyuu-shitsu no naka ni heya no shukushoo-mokei o
I TOP lab   GEN inside LOC room gen miniature-model acc
tsukutta.
made
'I made in my lab a model of the room.'

(7) The world's population is stabilizing. [BECOME]
Sekai jinkoo wa anteeka-shitsutsu-aru.
world population TOP is-stabilizing
'The world's population is stabilizing.'

The results of sorting clauses under these criteria, summarized in Table 1, do not support Ikegami's hypothesis.

	English	Japanese
DO	110	104
BECOME	255	248
Total	364	352

Table 1

The reason why there are fewer clauses in Japanese than in English in Table 1 is that some English transitive clauses are translated into stative intransitive clauses in Japanese, as in (8):

(8) These therapies <u>alleviate symptoms</u>, not causes.
Chiryoohoo wa izuremo <u>taishoo-ryoohoo de,</u> konpontekina
treatment TOP each-one symptomatic-treatment COP fundamental
chiryoohoo de wa nai.
treatment COP TOP not
'The therapies are all symptomatic treatments, not fundamental ones.'

In (8), the English original uses the transitive VP *alleviate symptoms,* but the Japanese translation is stative, *taishoo-ryoohoo de* 'are symptomatic treatments', and, therefore, such Japanese clauses were not counted.

As shown in Table 1, English does not use DO-type descriptions significantly more than Japanese does. Regarding this phenomenon, Kondo's (1986:2, cited by Uchiyama 1991:408) commentary is particularly relevant:

"One salient feature of English syntax, although often neglected by native speakers of English (and of other European languages) is a frequent and almost unlimited use of inanimate entities (things, time, space, collectives, abstract concepts etc.) as subjects for verbs that indicate intentional acts. To treat these uses as peripheral to mainstream English constructions fails to reflect an important characteristic of English, especially as viewed from the vantage point of a Japanese speaker." (Translation by Uchiyama)

If we take Kondo's phrase "verbs that indicate intentional acts" as referring to verbs that *can* express an agentive act when occurring with a human subject, as in (9), then, Ikegami's claim is justified. The new count is shown in Table 2.

(9) This lightning-fast channel jumping should <u>permit</u> [DO] cognitive radio systems to transmit voice and data streams at reasonable speeds.
kono   denkoo-sekka.no chiiki-henkoo,   ni.yotte, onsei ya   deeta o
this   lightning-fast   channel-jumping by   voice and   data   ACC
shikarubeki sokudo de <u>yaritori   dekiru   yoo.ni.naru</u>. [BECOME]
reasonable   speed   at exchange able   become
'By this lightning-fast channel jumping, we will become able to exchange voice and data at reasonable speeds.'

Of course, the meaning of *permit* in (9) is quite different from a situation of one human being giving another human being permission to do something.

	English	Japanese
DO	260	187
BECOME	104	165
Total	364	352

Table 2

In Table 2, the ratio of DO vs. BECOME in English is 2.5:1, whereas that of Japanese is 1.1:1. That is, if we re-categorize the predicates in the way explained above, we find that, while

Japanese uses DO type and BECOME type equally frequently, English uses more than twice as many DO type descriptions than BECOME type ones. Therefore, Table 2 would support Ikegami's hypothesis. However, this cross-linguistic difference is not likely to impress English speakers, because they do not consider such sentences as those in (10) to be agentive:

(10) a.   The popularity of Wi-Fi also <u>brings</u> problems.
     b.   The alternative possibility — that living cells or their precursors arrived from space — <u>strikes</u> many people as science fiction.

Because many Japanese transitive verbs imply agency, Japanese speakers tend to assume that the same is true with English transitive verbs, and they sometimes even conclude that English speakers conceive the world differently, as the following excerpt suggests:

> "In English, one very commonly attributes actions to inanimate subjects. A telephone, for example, can wake one up; a stone can break a window, etc. However, the Japanese normally find it difficult to conceive of an inanimate subject as performing or undertaking a conscious act of will or action of its own volition, or instigating a process." (Uchiyama 1991:406)

In English, verbs like *kill* can take such inanimate subjects as *accident*, *earthquake*, *illness*, and *war*, whereas the Japanese counterpart *korosu* cannot. Therefore, if one equates *kill* with *korosu*, one will conclude that English speakers construe such inanimate entities as performing conscious acts. Anthromorphism gone wild is exciting; differences in lexical meanings and in subject selection possibilities is boring.

   In fact, Ikegami's claim (1982:101) seems to be that although the actor in the *actor-action* structure is typically a human, the pattern itself is so strongly preferred that English enables inanimate entities, or even the names of event types, relations, or abstract properties to appear as the sentence subject. In our parallel corpus, the transitive clauses with an inanimate subject number 147 in English and 76 in Japanese.[5] Furthermore, some inanimate subjects are abstract. With intransitive clauses, the Japanese translations have 53 abstract subjects, surpassing 38 in English. By contrast, with transitive clauses, we found 50 abstract subjects in English and only 17 in Japanese. Here, it seems valid to conclude that transitive constructions with inanimate

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[5] Humans, animals, social organizations, and robots are included in the category of animate subject; natural forces are excluded.

subjects are less favored in Japanese, although the difference in intransitive clauses is not as clear-cut.

Tokieda (1950) proposes another typology: *object-centeredness* (*mono chuushin*) vs. *event-centeredness* (*koto chuushin*). In his analysis, a situation can be described by selecting an entity (typically the actor) as a focus and expressing the situation surrounding it (object-centered encoding), or the entire situation can be described without focusing on any particular entity (event-centered encoding). Western languages are said to prefer the former, whereas Japanese is said to favor the latter. Tokieda also claims that speakers of Western languages *prefer to perceive the world as objects*. The claim seems to be that the NP *the recognition of this fact* in (2) is heard by the English-speaker as the name of an object, whereas the clause *we understand this* in (3) is heard by the Japanese-speaker as referring to an event. The claim about English-speakers' experience is at best untestable.

Toyama (1973:10) expresses the difference in more strictly grammatical terms; he contends that sentences in Western languages are fundamentally noun-centered, e.g. (2), whereas the Japanese language exhibits a strong inclination towards verb-centeredness, e.g. (3). He even considers the noun-centered construction a more adequate medium for careful reasoning.

Traditional grammar maintains that nouns and verbs are purely morphosyntactic categories which may have certain semantic tendencies. Langacker (1987), however, claims that the core difference is in fact semantic/pragmatic. On his account, nouns pick out *regions*, "set[s] of interconnected entities," where an entity is intended to be "maximally general," including "things, relations, sensations, interrelations, points on a scale, locations in the visual field, etc" (962-63). Verbs, on the other hand, pick out processes: sets of relations between entities, aligned along a temporal axis and understood or construed by sequentially scanning the relation.

Abstract nouns, most obviously those derived from verbs (*discussion*, *contribution*, etc), would seem to pose a problem to a purely notional division of parts of speech. But Langacker argues that they too fit the region vs. process categorization. A process, as a sequence of coordinated relations across time, is already amenable to construal as a temporally-delimited region: "every process … defines an implicit region consisting of its component states" (90). For instance, *explode* in its physical sense denotes a process in which (very roughly) some whole item comes apart due to a great force that pushes fragments of the whole outward. These various parts (the whole, the pieces, the force) and the relations between them (the force acts upon the whole, the pieces come apart and move, etc.) are temporally and conceptually bounded, but this is not profiled by the verb. What the derived noun *explosion* does is "raise this [bounded] region to the level of explicit concern …" (90).

At the very least this confirms what is commonly assumed, namely that what is expressed by verbal predication in one language may be equally-well expressed nominally in another. The fact

remains that a process reconceived as an entity (as via nominalization) is available for participation in predications that otherwise would have been impossible. One way to interpret the claim that English is more noun-centered is that certain events, which may be naturally expressed in English by predicating some property of a nominalized event, are usually depicted in Japanese as relations between non-nominalized processes.

The difference between nouns and verbs is reduced somewhat in FrameNet, because words with the same conceptual background are said to evoke the same frame. The phrases *their discoveries of fossils* and *they discovered fossils* may, according to Langacker, differ in conceptualization, but they both contribute the content of the `Becoming_aware` frame and the fillers of two of its frame elements (COGNIZER and PHENOMENON). For this reason, FrameNet abstracts out certain characteristics idiosyncratic to English and, therefore, can apply to other languages, although some modifications will be occasionally called for. We will demonstrate this possibility shortly.

Those researchers who subscribe to the object (noun) centeredness and event (verb) centeredness typology do not mean that this characterization applies to all sentence types; it, rather, applies when some kind of causation is involved. When Situation1 causes Situation2, both are likely to be expressed by clauses in Japanese, but, frequently, Situation1 is referred to by an abstract NP in English. Sentence (11) illustrates this type of encoding from our corpus:

(11) Better diagnosis has made experts aware that Parkinson's disease can attack those younger than 40.

Shindan	*hoohoo*	*ga*	*shinpo-shita*	*koto*	*ni.yotte,*	*40-sai.miman*	*demo*
dagnosis	method	NOM	advanced	NMLZ	by	40.below	even

paakinson-byoo		*o*	*hasshoo-suru*	*koto*	*ga*	*wakatte.kita.*
Parkinson's disease		ACC	acquire	NMLZ	NOM	aware.became

'Due to the fact that diagnostic methods advanced, we've become aware that even those who are under 40 can have symptoms of Parkinson's disease.'

Capturing this rhetorical difference is not an easy task, requiring a firm grasp of syntactic, semantic, and stylistic differences between the two languages. No automatic translation algorithms have even attempted to deal with it, and it is quite challenging for human novice translators. In the following, we will demonstrate how we can analyze and represent the 'causing' relation in (11) in terms of frames developed in FrameNet.

The matrix predicate in (11) is MAKE, which evokes the `Causation` frame (frame-evoking elements are shown in all-capitals):

> Definition: A Cause causes an Effect. Alternatively, an Actor, a participant of a (implicit) Cause, may stand in for the Cause.

(12) [Better diagnosis]_{CAUSE} has MADE [experts aware that Parkinson's disease can attack those younger than 40]_{EFFECT}

Better (or rather, *good*) would normally evoke the `Desirability` frame; however, as a comparative adjective modifying a nonspecific noun, we understand it as contributing the notion that diagnoses are better than before. Therefore, the overall concept evoked by *better* here is best described involving as the `Progress` frame:

> Definition: An Entity changes from a Prior_state to a Post_state in a sequence leading to improvement.

Diagnosis is identified as the ENTITY of this frame: BETTER [diagnosis]_{ENTITY} Thus the Cause in this sentence is the progress (improvement) in diagnoses.

AWARE evokes the `Awareness` frame:

> Definition: A Cognizer has a piece of Content in their model of the world. The Content is not necessarily present due to immediate perception, but usually, rather, due to deduction from perceivables.

This results in the following frame-element assignment:

(13) Better diagnosis has made [experts]_{COGNIZER} AWARE [that Parkinson's disease can attack those younger than 40]_{CONTENT}

CAN evokes the `Possibility` frame:

> Definition: A Possible_event is deemed to have some probability of occurrence, if some (generally implicit) further Condition pertains.

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Here the possibility is that "Parkinson's disease attacks those younger than 40," which we may bracket as:

(14) Better diagnosis has made experts aware that [Parkinson's disease]_{POSSIBLE_EVENT} CAN [attack those younger than 40]_{POSSIBLE_EVENT}

Because of the syntax of modals, the frame element is split into the subject and non-finite predicate.

Finally we note the `Attack` frame:

> Definition: An Assailant physically attacks a Victim (which is usually but not always sentient), causing or intending to cause the Victim physical damage.

This frame is used metaphorically to express how Parkinson's disease affects people:

(15) Better diagnosis has made experts aware that [Parkinson's disease]_{ASSAILANT} can ATTACK [those younger than 40]_{VICTIM}

Several other frames are involved here (*young*: `Age`; *-er*: `Comparison`; *expert*: `Expertise`; etc.), but since our present purpose is to examine event structure and larger scenes, we put them aside.

In the process of translation into Japanese, we recognize that the `Causation` frame includes as its lexical item *ni.yotte*:

(16) [Shindan hoohoo ga shinpo-shita koto]_{CAUSE} NI.YOTTE [40-sai.miman demo paakinson-byoo o hasshoo-suru koto ga wakatte.kita]_{EFFECT}

> BECAUSE [fact: diagnosis has improved] [(people) understand fact: even people under 40 can get Parkinson's disease].

In English, the `Progress` frame is evoked by *better*, but denoting an event by an adjective is rare in Japanese; therefore, this event needs to be expressed explicitly by including an evoker of the `Progress` frame, e.g. *shinpo-shita* 'progressed':

(17) [Shindan hoohoo]_{Entity} ga SHINPO-SHITA koto ni.yotte 40-sai.miman demo paakinson-byoo o hasshoo-suru koto ga wakatte.kita

The Awareness frame contains *wakaru* 'understand'; the COGNIZER frame element is implicit here:

(18) Shindan hoohoo ga shinpo-shita koto ni.yotte [40-sai.miman demo paakinson-byoo o
        hasshoo-suru koto]_{Content} ga WAKATTE.kita

We now need to consider a major rhetorical difference between English and Japanese, namely, the topic-worthiness phenomenon. Other things being equal, the following hierarchy of topic-worthiness is normally followed in Japanese:[6]

(19) Human (first/second person) > Human (third person) > Animate Nonhuman > Inanimate

Therefore, when translating into Japanese, the sentences like the following, in which a non-human entity is selected as the subject (occupying a more salient position) and a human is downgraded as the object, must be reconstructed in such a way that the human occupies the subject position:

(20) a. The alternative possibility ― that living cells or their precursors arrived from space
          ― strikes many people as science fiction.
      b. But nothing prepared me for the curious challenges involved in figuring out what
          Washington actually looked like.
      c. These insights are making scientists more confident that it will be possible to spot
          warning signs well before the next big one [earthquake] blows.

The subject of *attack* in (11) is *Parkinson's disease* and the direct object is humans; therefore, we need to paraphrase it along the line of *those younger than 40 can acquire Parkinson's disease*, which evokes the Getting_disease frame:

   Definition: A Victim starts off without the Disease, and then comes to suffer from it. If the Disease is infectious, then the Source from which the Disease is transmitted may be mentioned.

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[6] Determination of topic-worthiness involves several factors: the natural topic hierarchy of Hawkinson and Hyman (1974), Givón's case hierarchy (1976) and intrinsic topicality hierarchy (1979), the agency hierarchy of Silverstein (1976) and Comrie (1981), and the topic acceptability scale of Lambrecht (1986).

The `Getting_disease` frame includes as its frame evokers *kakaru*, *naru*, *kansen-suru*, *hasshoo-suru*, etc.

(21) Shindan hoohoo ga shinpo-shita koto ni.yotte [40-sai.miman]_{Victim} demo
       [paakinson-byoo]_{Disease} o HASSHOO-SURU koto ga wakatte.kita

In conclusion, we outlined in this paper several rhetorical differences between English and Japanese claimed by Japanese researchers and tested their validity using a bilingual corpus consisting of English magazine articles and their Japanese translations. Our corpus supports some of the claims, but rejects others. We then selected one pair of sentences and demonstrated how the conceptual frames developed by FrameNet can contribute to translating expressions from English to Japanese. Because the semantic difference between verbs and event-denoting nouns are abstracted out in FrameNet, and they both can evoke the same frame, our frames are versatile when applied cross-linguistically to languages that prefer different strategies in encoding events.

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