When the Japanese *so-called* "formal noun" *koto* attaches to a clause, the construction yields a sentential nominal. The previous studies (Kuno 1973, Josephs 1976) claim that the sentential nominal headed by *koto* denotes a more abstract concept (e.g., 'state of affairs/fact') than the ones headed by *no*, which denote more concrete objects (e.g., 'event'). This paper presents a novel set of data which shows that the sentential *koto*-nominal is not homogeneous in all linguistic contexts. In particular, the sentential *koto*-nominal can also denote a rather concrete entity, namely an event. In analyzing the data, we show that the semantic function of *koto* is uniform, but the sentential complement of *koto* is ambiguous between a full-fledged inflectional phrase and a reduced one, and that this syntactic difference has semantic consequences.

DATA: The same string of words *akuseru pedaru-ga koshoo-shita koto* 'that the gas pedal broke' can appear as causer arguments of two kinds of causal expression as in (1) and (2). The semantic type of the causer argument of the causative verb *hikiokoshita* depends on the semantic type of the result (i.e., the causee). In (1), the *koto*-nominal, the causer, can be a fact or an event which prompted the consumers to leave Toyota. In (2), it can only be an event which directly caused the accident. The difference between the two sentences emerges when the modal *kamoshirenai* 'maybe/might' is inserted as indicated by the parentheses. When the *koto*-nominal denotes a causer of people's decision as in (1), it can contain the modal. In contrast, when the *koto*-nominal is a causer of the accident as in (2), it cannot contain the modal. (The same pattern obtains with other modal expressions, such as *osoraku* 'probably', *nichigainai* 'must'.)

(1) akuserupedaru-ga koshoo-shita (kamoshirenai) koto-ga shoohisha-no toyota-banare-o hikiokoshita.
gas.pedal-NOM break-did maybe FN-NOM consumers-GEN Toyota-leave-ACC caused
'The fact that the accel pedal (might have) broke caused the consumers to leave Toyota.'

(2) akuserupedaru-ga koshoo-shita (*kamoshirenai) koto-ga jiko-o hikiokoshita.
'That the gas pedal (*might have) broke caused the accident.'

This pattern is puzzling in view of the previous studies which argue that the function of *koto* is to build an abstract object which one might term a 'fact'. First, if the sentential *koto always* denoted a 'fact', the asymmetry of the availability of the modal would not be predicted. Second, the abstract 'fact' should not be able to be an argument of a direct causal relation, which requires concrete objects as their arguments, hence (2) even without *kamoshirenai* is predicted to be ungrammatical.

Rather, the data suggests that there is more than one type of sentential *koto* nominalization. Intuitively speaking, in some contexts (1), the *koto*-nominal refers to a fact and it can embed a modal. In the other context (2), it refers to an event and it cannot embed a modal. This paper shows that this intuition is supported by a syntactic distinction between nominalization of TP vs. AspP, which has semantic consequences: the former denotes a fact, and the latter denotes an event. Our data and analysis support that an inflectional category such as TP has a layered structure (see Kratzer (1998)) and show that each syntactic representation in the layer indeed has a semantic counterpart which compositionally produces a distinct semantic object.
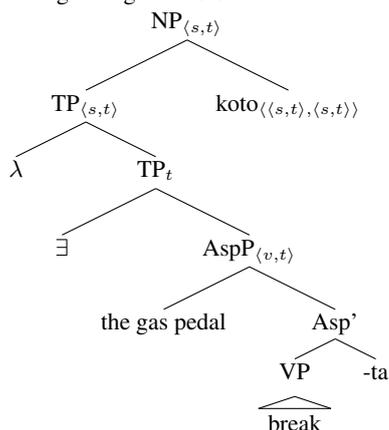
***koto* AS A MAXIMALITY OPERATOR:** As often reported in the literature, the NP-*no-koto* has a definiteness effect (see Kurafuji 1998, Takubo 2007). For example, *Taroo-wa kyooju-no-koto-o mitsuketa* only means 'Taroo found the professor.' and cannot mean 'Taroo found a professor'. We propose that this definiteness effect is achieved by defining *koto* as a maximality operator with a uniqueness presupposition, which takes a power set of the set denoted by the noun phrase $Pow(P)$ and returns the largest set, i.e., $Max(Pow(P))$. In the case of a singular noun, the maximal set refers to a singleton set, hence it refers to a professor uniquely identifiable in the context. We show below that the function of *koto* as the maximality operator can be extended to other kinds of properties, namely world properties (i.e., intensionalized propositions) and event properties. That is, *koto* has the uniform semantic type $\langle\langle\alpha, t\rangle, \langle\alpha, t\rangle\rangle$, where α can be e, s, or v.

TWO MERGER SITES FOR *koto*: There could be a series of functional categories in a sentence (c.f., Kratzer's (1998) tense/aspect combination). Hence, the meaning of the sentential nominal headed by *koto* depends on with which category *koto* merges. In other words, there are several candidate structures for the constituent sister to *koto*. One structure is a full-fledged TP (or ModalP if the clause contains a modal) as in (3a). Let us see the composition step-by-step. First, an AspP introduces an event predicate, i.e., $\langle v, t\rangle$. Note that the morpheme *-ta* is not a tense marker but an aspect marker that expresses a culminated

event (see Ogihara 1999 for discussions on the status of *-ta*). Then, the event predicate is saturated by the existential closure yielding a proposition of type t, $\exists e.[\text{THEME}(e, \text{g-p})\&\text{BREAK}(e)\&Cul(e)]$. Next, at the level of $\text{TP}_{\langle s,t\rangle}$, the proposition is intensionalized by lambda abstraction over possible worlds $(\lambda w.^{\wedge}\exists e.[\text{THEME}(e, \text{g-p})\&\text{BREAK}(e)\&Cul(e)](w))$. The Max-operator denoted by *koto* takes this intensionalized proposition and returns a maximal set of worlds in which the proposition is true. In most of the cases, the most plausible reason why the proposition is the uniquely identifiable maximal set of worlds is because it is a fact. Indeed, sentential *koto*-nominals often have factive presuppositions as reported in the literature (see Kuno 1973).

In contrast, the other structure only contains a reduced inflectional phrase, namely AspP as in (3b). The event predicate directly becomes the argument of *koto*, the Max-operator, yielding a maximal set of events, $Max(Pow(\{e : \text{THEME}(e, \text{g-p})\&\text{BROKE}(e)\&Cul(e)\}))$.

(3)   a. High merger of *koto*   b. Low merger of *koto*
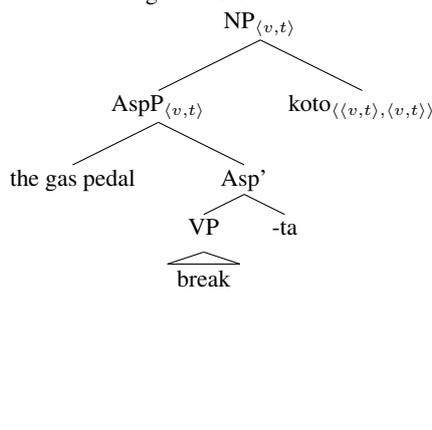
DISCUSSION: Our analysis correctly predicts the pattern observed in (1) and (2). The modal expression, *kamosirenai* 'maybe/might' is the $\diamond$-operator that takes an intensionalized proposition $^{\wedge}p$ and returns a new proposition $\diamond^{\wedge}p$, 'it is possible that $^{\wedge}p$'. In other words, *kamosirenai* is of type $\langle\langle s,t\rangle,t\rangle$. Hence, only (3a) has a node with which *kamosirenai* can be merged, namely $\text{TP}_{\langle s,t\rangle}$. The resulting construction (4) denotes the maximal set of worlds in which it is true that it is possible that the gas pedal broke. (Note: All the operators are place at the SPEC positions for readability.)

(4) $[_{\text{NP}_{\langle s,t\rangle}}$ koto$_{\langle\langle s,t\rangle,\langle s,t\rangle\rangle}$ $[_{\text{MP}_{\langle s,t\rangle}}$ λ $[_{\text{MP}_t}$ $\diamond_{\langle\langle s,t\rangle,t\rangle}$ $[_{\text{TP}_{\langle s,t\rangle}}$ λ $[_{\text{TP}_t}$ $\exists$ $[_{\text{AspP}_{\langle v,t\rangle}}$ the gas pedal broke]]]]] koto]

Hence, it is a fact the recognition of which caused the consumers' decision of leaving Toyota (fact/indirect-causation) as in (1). However, the TP-*koto* cannot be an argument of direct causation, since direct causation only takes objects which can be spatio-temporally located (i.e., events and individuals, but not possible worlds) as its arguments (Davidson 1973, Bennett 1988, Asher 1993 among others). Thus, the TP-*koto* in (2) is illicit. In contrast, the structure in (3b) cannot host *kamoshirenai*. No node in the tree denotes t or $\langle s,t\rangle$ below the point where the AspP is merged with *koto*, since the event predicate is immediately closed off by the Max-operator. In short, if a sentential nominal headed by *koto* contains a modal, it must be the TP-*koto*, and the TP-*koto* is not a licit argument for direct causation since it does not denote an event but it is a fact. Therefore, (2) with the modal is ungrammatical.

CONCLUSION: *Koto* has a uniform semantic function that takes a property of type-α entities and returns back a maximal set of $\langle\alpha,t\rangle$. The sentential nominal headed by *koto* is syntactically ambiguous. If the sister of *koto* is a full-fledged TP, it denotes a fact and it can host a modal expression but it cannot be an argument of direct causation. In contrast, if the sister of *koto* is an AspP, it denotes an event, which can be an argument of direct causation, but the clause cannot host a modal. Our analysis evidences the layered structure for TP and its semantic realization by deriving distinct semantic objects from the constructions which appear to be identical.

SELECTED REFERENCES: Kratzer (1998) 'More Structural Analogies Between Pronouns and Tenses.' Kurafuji (1998) 'Definiteness of Koto in Japanese and Its Nullification.' Kuno (1973) 'The Structure of the Japanese Language.' Ogihara (1999) 'The Semantics of Tense and Aspect in Japanese'