Nominalization and De-nominalization as Diachronic Syntactic Change

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1. Introduction

Since the advent of the lexicalist hypothesis and X’-theory in Chomsky (1970), nominalization has been one of the most controversial issues in generative syntax. For examples, discussions have been continuing about issues such as whether nominalization is a lexical or syntactic process (di Sciullo and Williams (1987); Ogawa (2001); Bruening (2018)), whether conversion involves relisting or affixation of phonetically empty nominalizer (Lieber (1992); Don (2005)), or whether there is a phrasal affix or not (Mchombo (1995); Kishimoto (2006)). However, most of the previous theoretical approaches to nominalization have focused on various synchronic issues related to nominalization. And as far as we know, they have almost never been given a solution from a diachronic perspective (but see Noonan (1997)). Moreover, there has been little, if any, discussion about diachronic issues, e.g., issues about whether any nominalizing affix can change diachronically from a lexical one to a phrasal one (or vice versa), or whether a nominalizing affix can change diachronically to a non-nominal one (or vice versa), via grammaticalization, constructionalization, and/or lexicalization.

In this article, we are going to discuss these very issues, in view of the diachronically changing possibility of Genitive Case, a typical NP-internal Case, that occurs in an apparently verbal or adjectival clause in Japanese. At the same time, we will show that the diachronic perspective will disambiguate some of the controversial issues related to synchronic analyses of nominalization, in the sense that there are some syntactic constructions that show both verbal and nominal properties but their nominal nature is not morphologically represented but only syntactically implicated, which means that at least some instances of nominalization must be phrasal, and hence syntactic in nature. This will argue indirectly for a zero derivation analysis of conversion such as Don (2005), for the existence of another phrasal nominalizing affix than what Kishimoto (2006) shows, and for the obliteration of the border between morphology and syntax, as has been extensively argued for in the field of distributed morphology (Marantz (1997), Borer (2005, 2015), Harley (2009), Bruening (2018), among many others).

The first core data we will deal with in this article is a set of Japanese examples as in (1):
Here, the noun head is modified by a relative clause, in which the subject is usually suffixed by the Nominative Case-marker *ga*, but it can also be suffixed by the Genitive Case-marker *no*. This phenomenon is normally referred to as the “Nominative/Genitive Conversion” in the Japanese syntax (Harada (1971, 1976); Miyagawa (1993, 2011, 2013), Watanabe (1996); Ochi (2001); Hiraiwa (2002, 2005); Maki and Uchibori (2008); among many others). Even if you are not familiar with the Japanese phenomenon, you will know the three types of gerunds in English, which we usually refer to as “-ing-of gerunds, Poss-ning gerunds, and Acc-ning gerunds, respectively. Among these three types of gerunds, the Poss-ning gerund, as in (2a), has a kind of mixed projection in that its external syntax is nominal, while its internal syntax is verbal: the pre-gerundive subject is Genitive-Case-marked, while the post-gerundive object is Accusative-Case-marked and a VP-adverb modifying the gerund is also possible. By contrast, the Acc-ning gerund in (2b) is verbal, both externally and internally, in that both the pre-gerundive subject and the post-gerundive object are Accusative-Case-marked:

(2) a. John’s/his skillfully fixing the sink  
   b. John/him skillfully fixing the sink

The Nominative/Genitive conversion (NGC) in Japanese is similar to the alternation between the Poss-ning gerunds and the Acc-ning gerunds, except that the Genitive subject alternates with the Nominative subject rather than the Accusative one.

In many languages in the world, there are constructions in which a single grammatical subject or object can receive more than one type of morphological Case, and a number of proposals have been made to account for the synchronic syntactic variation in a principled way and in fact, such a proposal has been used to defend the larger system of Case Theory or a theory of phrase structure and movement in generative syntax. If the ambiguous morphological Case-marking corresponds to some syntactic difference and the morphological ambiguity is diachronically stable, then such a property may reflect a property of Universal Grammar. For example, in cases like (1), in which a subject is marked for either Nominative or Genitive Case, the simplest answer would be to assume that Nominative Case is assigned by a C-T amalgam (Chomsky (2001)) and that Genitive Case is assigned by a nominal functional category, so that the morphological ambiguity in (1) would show that the embedded clause is structurally
ambiguous in terms of whether the subject is in the same phase as C or D (Miyagawa (2011)). However, if the way the embedded subject in (1) is Case-marked varies over different time periods and there is a directionality of either broadening or narrowing the ambiguity, then we need to be careful about whether the ambiguity reflects a property of Universal Grammar or the result of some parametric syntactic change, because it has two different structures for different age groups and an older grammar for an older age group and a newer grammar for a younger age group happen to coexist. In fact, we are going to show that even in constructions in which both Nominative and Genitive Cases are possible in the present-day Japanese, a long history of documented Japanese writings shows that in classical Japanese, there was a period in which only the morphological Genitive Case was allowed, and only after the 12th century did the morphological Case-marker ga begin to be used to denote a Nominative Case in the matrix clause, and in the later 19th century, when the embedded clause totally lost its nominal character due to the loss of adnominal inflection on C, the embedded clause underwent de-nominalization, and the progressive decrease in the frequency of Genitive subjects has been taking place.

Given the history of the Japanese language in which a clause that was originally nominalized began to be de-nominalized, we need at least to assume that nominalization can be a syntactic process rather than a lexical one, contra Chomsky (1970).

We will also corroborate this view, by presenting another construction in which verbs and adjectives appear to be nominalized by a zero affix and showing that the process is not lexically limited but is very productive, as far as they involve either coordination or juxtaposition, and that it is unreasonable to assume that a lexically nominalized doublets of each verb and adjective must be stored in the lexicon (Don (2005)). As such a construction has just emerged in the Japanese grammar around 100 years ago, we argue that it is instrumental to look at the diachronically changing facts available from historical corpora, to resolve the long-standing issue of whether nominalization is a lexical or syntactic process.

Our arguments in what follows are two-fold: on one hand, we will take up a nominalized clause in which both a Nominative and a Genitive Case could be freely licensed in the past, but Genitive Case has been less and less likely to be acceptable, and argue that in such a clause, what was once a nominalized clause has been “de-nominalized,” either because the nominalizing functional category on top of the verbal functional projections has been eliminated by the process which we call “clause shrinking,” or because the formal noun that once functioned as the nominalizer of a clause has been grammaticalized into a verbal functional category in the modal domain (see (1) above and (3) below).

More specifically, the second type of “de-nominalization” is illustrated by the modal noun hazu ‘probability’, which is known to have been grammaticalized from a common noun
meaning “the nock of an arrow,” and from the advent of its formal noun uses in the mid 17th century, it continued to license both Nominative and Genitive subjects, but it has been undergoing secondary grammaticalization (in the sense of Brinton and Traugott (2005)) toward a pure modal auxiliary in the complementizer domain, which is another kind of de-nominalization. As a result, in such a clause, a Genitive subject is becoming less and less frequent:

(3) Koko-ni Taro-ga/%no iru-hazu-ga nai. <ga/no → ga/*no>
    here-in Taro-Nom/Gen is-probability-Nom Neg
    ‘(Lit.) There is no probability that Taro is here.’

On the other hand, we will take up a coordinated NP that contains non-nominal conjuncts in which only a Genitive subject could be licensed in the earliest stage, but has been expanded to accept a Nominative subject as well, and argue that in such a peculiar NP, the host class of each conjunct selected by the phonetically empty nominalizer was originally as small as the verbal/adjectival root but has been gradually expanded to as large as CP, the highest verbal functional projection, as shown in (4) below:

The third type of NGC can be illustrated in (4a,b), where either a Genitive or Nominative Case appears on the subject of a conjoined or juxtaposed verb/adjective. This is a newer construction that emerged and began to develop in the late 19th century:

(4) a. Taro-no/%ga iruV to inaiA to-de/niyotte, ...
    Taro-Nom/Gen is and is-not Conj-with/depending.on
    ‘Depending on whether Taro is here or not, ...

b. Taro-no/%ga iruV inaiA de/niyotte, ...
    Taro-Nom/Gen is is-not with/depending.on

The coordinator to ‘and’ is otherwise used only to combine two or more NPs. Hence, the verbs or adjectives in (4a,b) should also have assumed a nominal feature in one way or another, although there is no overt nominalizer. Hence, for this type of construction, which we will henceforth refer to the “Coordinated Non-Nominal Construction (CNNC)”, we will argue that a phonetically empty nominalizer is suffixed to each of the conjunct, before they are coordinated. Another peculiar property of this construction is that it can conjoin two verbs or adjectives, as far as the two conjuncts are mutually in a semantically antonymic relation. In the CNNC, the Genitive Case was the only morphological Case possible when it began to be used, but both Genitive and Nominative subjects are more or less equally possible in the modern
Japanese. No previous research in Japanese linguistics has ever discussed this peculiar type of NGC. We will argue that there has emerged a phonetically empty nominalizer that nominalizes each non-nominal conjunct in this type, and that the nominalizer was originally taking scope over a juxtaposition (dvandva) of antonymic adjectives or stative verbs, as in (5a,b) (cf. Scalise, Fábregas and Forza (2009)):

(5)  

a. ude-no/*ga yoshiA-ashiA  (cf. *ude-no yoshi / *ude-no ashi)  
skill-Gen/*Nom good-bad  
‘whether one’s skill is good or bad’

b. zaisan-no/*ga aruv-nasiA  (cf. *zaisan-no aru / *zaisan-no nasi)  
property-Gen/*Nom be-not.be  
‘whether one has enough property or not’

Hence, it was originally compatible only with a Genitive subject. We propose, however, that from the late 19th century on, with the dvandva of the type in (5) increasing both type frequency and token frequency, the nominalizing affix has been coming to select a larger and larger clause in each conjunct in the CNNC; ultimately, a Nominative subject, which needs CP, has also become possible. This diachronic change, which we refer to as “syntactic constructionalization,” following Ogawa (2014), is the opposite pattern to (1), where the disambiguation goes toward the exclusion of a Genitive subject in the relevant syntactic environments. It is also different from what we observe in the NGC of the type in (3), where too the disambiguation goes toward the exclusion of a Genitive subject in the relevant syntactic environments. But we will argue that the disambiguations taking place in (1) and (3) are different from each other in that the former is a change in the value of the syntactic microparameter related to the selection of the Genitive-Case-licensing functional head D, while the latter is the grammaticalization of the formal noun to a modal functional category in the verbal extended projection.

To test the validity of the three hypotheses that all the three types of “nominalized” or “de-nominalized subordinate clauses” in Japanese are either developing or declining within the last 100 years, we have administered both corpus studies and three large-scale Internet-based surveys of acceptability judgments on the three constructions, each of which targeted for hundreds of participants whose ages range between 20s and 70s. The corpus studies made it clear that the constructions in (1) and (3) are less and less compatible with a Genitive subject, while (4b) is now in the process of increasing its type frequency and token frequency. In accordance with this diachronic change in frequency, and the Internet-based survey made it
clear that the younger age groups are less and less likely to accept the constructions in (1) and (83), while they are more and more likely to accept the constructions in (4a,b).

This paper is organized as follows: section 2 shows why the diachronic perspective is necessary for the NGC in Japanese, by introducing Nambu’s (2007, 2014) and Ogawa’s (2018, 2019a) corpus studies about the NGC of the type in (1). This section summarizes Ogawa’s (2018) explanation of the diachronic change in (1) in terms of a syntactic microparameter. Section 3 discusses the issue of Genitive subjects licensed in the complement of a formal noun, taking ḥazu in (3) as a representative, and what predictions will be made as to the acceptability judgment of each of this type of NGC made by different age groups of Japanese native speakers. Sections 4 discusses the issue of Genitive subjects licensed as the subject of either coordinated or juxtaposed antonyms as in (4a,b), in its relation to the dvandva compounds in (5a,b), and shows how the syntactic constructions in (4a,b) have been developed from the compounds in (5a,b). Section 5 will introduce the two surveys we administered in order to investigate the intergenerational difference in the acceptability of Nominative and Genitive subjects occurring in the constructions in (3) and (4), respectively, and show what results we obtained for each of them. Section 6 is a discussion of the results we obtained in section 5. Section 7 is a conclusion, with implications the present study has for the theory of nominalization.

2. The Diachronic Change in NGC
2.1. Facts of Diachronic Change in NGC

A synchronic characterization of the NGC in Japanese has been a long-standing issue since its original observation by Harada (1971), and several mutually conflicting proposals have been made (Harada (1971, 1976), Miyagawa (1993, 2011, 2013), Watanabe (1996), Hiraiwa (2002, 2005), Maki and Uchibori (2008), among others). We will not go into the details of the comparison of these previous analyses here, as all of them are missing one important issue. The issue, which has been pointed out by Harada (1971), but was ignored until recently is the diachronic issue related to the acceptability of the NGC. He shows that there are several types of NGC which are accepted by the speakers of one of the two idiolects (his “Dialect A”) but not by the other (his “Dialect B”). He argues that the two groups are identical in their social and geographical backgrounds and differ only in their age: those who were in their 40s at the time accepted examples like (6a,b), while those who reject them were in their twenties at the time:

(6) a. me-ga/(*n) nakanaka de-nai sakura-no-ki
    sprount-Nom/Gen be-slow-to come.out-not cherry-tree
    ‘a cherry tree which is slow to sprout’

6
b. titiyo-ka/(?*)no dai-ongakka de-atta buturigakusya
father-Non/Gen great musician was physicist
‘a physicist whose father was a great musician’

<table>
<thead>
<tr>
<th></th>
<th>Ages of the speakers</th>
<th>(6a)</th>
<th>(6b)</th>
</tr>
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<tbody>
<tr>
<td>Dialect A</td>
<td>In their 40s</td>
<td>OK</td>
<td>OK</td>
</tr>
<tr>
<td>Dialect B</td>
<td>In their 20s</td>
<td>?*</td>
<td>?*</td>
</tr>
</tbody>
</table>

<Table 1: Dialectal difference in the acceptability of GSC>

In (6a), the subject and the predicate are intervened by a VP-adverb nakanaka ‘be slow to’. We will refer to this as the “Non-Adjacent Condition.” In (6b), the adnominal clause is a copulative sentence in which not only the subject but also the predicate is a noun phrase. We will refer to this as the “Nominal Copula Condition.” Harada argues that the younger native speakers of Japanese are less likely to accept a Genitive subject in the “Non-Adjacent Condition” and the “Nominal Copula Condition” among others, though there was no comparable restriction on the use of the Nominative subject in the same environments.

Harada (1971) concluded that what he calls “Dialect A is on the edge of losing its status as the majority dialect, and the newcomer, Dialect B is spreading among the speakers of the Tokyo dialect” (Harada (1971: 35)), and this conclusion was also endorsed by his own psycholinguistic experiment published in his 1976 paper.

Nambu (2007, 2014) conducts a diachronic quantitative study based on a Hansard Corpus in which he compiled speeches by the 100 Japanese politicians who were from the Tokyo metropolitan area that were made in the Diets or committees during the last 100 years. He sorted the utterances of Genitive subjects in terms of the birth years of the speakers and attested that the decline in the frequency of the Genitive subjects during the period is statistically significant:
Ogawa (2018) presents a quantitative investigation of written texts: I collected 15723 examples of the Genitive Subjects from a total of 130 books published between the 1890s and the 2010s (whose writers were born between the 1830s and the 1980s), and analyzed them in terms of which construction they occur in and their frequency per one million characters. The types of constructions investigated are summarized as below:

(7) a. Genitive subjects in a past tense clause
b. GSCs non-adjacent to the predicate
c. GSCs whose predicate is stative (verb or adjective)
d. GSCs whose predicate is an unaccusative eventive verb
e. GSCs whose predicate is a transitive or unergative verb
f. GSCs whose predicate is an individual-level predicate
g. GSCs whose predicate is a passivized verb
h. GSCs whose predicate is a nominal and which includes a copula *na/no*
i. GSCs headed by a formal (non-referential) noun
j. GSCs headed by an overt complementizer

Among these, (7b) and (7h) correspond to (6a) and (6b), and (8a,b) illustrate (7j):
In (8a), an overt interrogative complementizer *ka* co-occurs with a Genitive subject, while in (8b), an overt appositive complementizer *toiu* co-occurs with a Genitive subject. All the three types of examples in (6a), (6b) and (8a,b) were sporadically found in a text written by a writer who was born by the early 20th century and published in the years before the 1960s, though they steeply decreased their frequency in the last 100 years.
<table>
<thead>
<tr>
<th>the number of volumes</th>
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<th>9</th>
<th>14</th>
<th>18</th>
<th>32</th>
<th>50</th>
<th>130</th>
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<td>1889.22</td>
<td>1898.31</td>
<td>1914.95</td>
<td>1935.58</td>
<td>1959.69</td>
<td>1930.26</td>
</tr>
<tr>
<td>the number of characters</td>
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<td>750616</td>
<td>1966381</td>
<td>2479676</td>
<td>4831846</td>
<td>5927059</td>
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<td>tokens of Genitive subjects</td>
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<td>1172</td>
<td>2682</td>
<td>2330</td>
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<td>2295.31</td>
<td>1561.38</td>
<td>1363.93</td>
<td>939.64</td>
<td>810.04</td>
<td>625.27</td>
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<td>114</td>
<td>233</td>
<td>90</td>
<td>103</td>
<td>94</td>
<td>839</td>
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<td>226.22</td>
<td>151.88</td>
<td>118.49</td>
<td>36.30</td>
<td>21.32</td>
<td>15.88</td>
<td>decreasing by 93%</td>
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<td>1151</td>
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<td>1598</td>
<td>1475</td>
<td>2547</td>
<td>2736</td>
<td>10119</td>
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<td>810.00</td>
<td>812.68</td>
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<td>527.13</td>
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<td>8</td>
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<td>19.86</td>
<td>18.65</td>
<td>14.75</td>
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<td>873.95</td>
<td>681.96</td>
<td>375.45</td>
<td>278.15</td>
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<td>1395</td>
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<td>918.12</td>
<td>687.44</td>
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<td>531.89</td>
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<td>11</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>95</td>
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<td>frequency of Genitive subjects in a clause with an overt complementizer / PER MIL</td>
<td>67.31</td>
<td>14.65</td>
<td>5.09</td>
<td>2.42</td>
<td>1.03</td>
<td>0.34</td>
<td>decreasing by 99.5%</td>
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<Table 2: the diachronically changing frequency of the GSC per million characters (sorted by the year of publication of the relevant book) [Cf. Ogawa (2018) for details]>
<table>
<thead>
<tr>
<th>Table 2: the diachronically changing ratio of GSCs in a particular construction to all the GSCs (%; by year of publication)</th>
</tr>
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<tr>
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<tr>
<td>birth years of authors on average</td>
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<td>the number of characters counted</td>
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<tr>
<td>the total number of GSCs counted</td>
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<td>the percentage of Genitive subjects in a past tense clause / all the GSCs</td>
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<td>the percentage of Genitive subjects non-adjacent to the predicate / all the GSCs</td>
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<tr>
<td>the percentage of Genitive subjects whose predicate is stative / all the GSCs</td>
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<tr>
<td>the percentage of Genitive subjects whose predicate is an unaccusative verb / all the GSCs</td>
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<tr>
<td>the percentage of Genitive subjects whose predicate is a transitive or unergative verb / all the GSCs</td>
</tr>
<tr>
<td>the percentage of Genitive subjects whose predicate is an individual-level predicate / all the GSCs</td>
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<tr>
<td>the percentage of Genitive subjects whose predicate is nominal / all the GSCs</td>
</tr>
<tr>
<td>the percentage of Genitive subjects whose predicate is a passivized verb / all the GSCs</td>
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<tr>
<td>the percentage of GSC headed by a formal noun or an adnominal form of a predicate / all the GSCs</td>
</tr>
<tr>
<td>the percentage of GSC that is a relative clause / all the GSCs</td>
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<tr>
<td>the percentage of GSC headed by an overt complementizer / all the GSCs</td>
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</table>

< Table 3: the diachronically changing ratio of GSCs in each construction to all the GSCs in the same period (%; sorted by the year of publication) [cited from Ogawa (2018)]>

Table 2 shows change in frequency in the last 130 years, and Table 3 shows change in the ratio of the GSCs in a particular construction to all the GSCs in the same period. Different constructions in (7) show different levels of frequency in the first place, and they also show different levels of gradience in the decline of the frequency of Genitive subjects. Salient asymmetries in the gradience of decline are observed (i) between eventive and stative predicates, (ii) between clauses with a complement and clauses without it, (iii) between the non-
Among these results, it is important to note that the gradiences of decline in the types of GSCs
stated in (9c-e) are almost identical to each other: decline by more than 90% in the last 130 years. Note also that (9d,e) are illustrated in (6a,b), whose acceptability Harada shows to be subject to intergenerational variations. On the basis of these facts and others, Ogawa (2018) argues that the difference between Dialects A and B is a micro-parametric syntactic change that took place in the mid of the 20th century. More specifically, assuming (10a) as a general mechanism of Genitive and Nominative Cases in Japanese, Ogawa claims that the Dialect A is the dialect for which the GSC is a finite clause with the functional head C(omplementizer), while Dialect B is the dialect for which the GSC is a finite clause without C:

(10) a. A Genitive subject in the GSC in modern Japanese is licensed by the functional head D selecting it, which we refer to as $D_{Gen}$, while a Nominative subject in a clause is universally licensed by the functional head C. (cf. Miyagawa (2011, 2013))

b. Dialect A: The GSC is a CP selected by $D_{Gen}$.

c. Dialect B: The GSC is a TP selected by $D_{Gen}$.

We also assume the common syntactic structure of Japanese for the Nominative Subject Clause (NSCs) as in (11), and the Genitive Subject Clauses (GSCs) in (10b) and (10c) differ only in terms of whether $D_{Gen}$ selects the highest CP or the TP below CP, as in (12a,b):
For those native speakers who have (12a) as the structure of a GSC, a Genitive subject is compatible with an overt complementizer. There are independent reasons for which we can assume that the Adjacency Condition in (6a) and the Nominal Copula Condition in (6b) also require a CP structure (Ogawa (2019a)). Then, as a result of parametric change from (12a) to (12b) (cf. Rizzi (2017) for “Merge Parameter”), due to a sharp decrease in the frequency of the examples of the type in (6a,b) and (8a,b) among the primary linguistic data (PLD) for children leaning Japanese in the early 20th century, the number of those who acquire (12a) as the structure of GSC gradually decreased, which explains the facts stated in (9c-e), as well as Harada’s observation that the younger generations tend to judge (6a) and (6b) as unacceptable.

Ogawa (2018) further claims that diachronically, the licensing mechanism of Genitive subjects has one stage before (12a) and two stages after (12b). The post-(12b) stages will not been shown in this article, because they are almost irrelevant to our purpose (see Ogawa (2018) for a detailed discussion). What we are concerned with here is the pre-(12a) stage, which is structured in (13) (cf. Watanabe (1996); Hiraiwa (2002, 2005))

(13)

\[
\begin{array}{c}
\text{CnP} \\
\text{TP} \\
\text{vP} \\
\text{Subj} \\
\text{[Gen]} \\
\text{v'} \\
\text{VP} \\
\text{v} \\
\text{Obj} \\
\text{V} \\
\end{array}
\]

Hiraiwa (2002, 2005) argues that the Genitive subject in the present-day Japanese is licensed by the C with an adnominal inflection, or rentai’kei in traditional Japanese linguistics. This proposal is argued against in Maki and Uchibori (2008) and Miyagawa (2011), and we also suppose, following these previous analyses, that this is not a legitimate analysis of the present-day Japanese. However, Ogawa (2018) argues that (13) is legitimate as the structure of the GSC in the classical Japanese that spans from the 10th century to the late 19th century.

(13) differs from (11) in that the C in (11) is an extended projection of a verb, and hence is of a verbal category, while the Cn in (13) is a kind of mixed category that has both nominal and verbal features. Among the nominal features are the adnominal inflection (AND) and the Genitive Case feature of the probe that licenses a Genitive Case of the goal. The adnominal inflection on C is illustrated by *na*, while *da* is the conclusive inflection (CON) that cannot license a Genitive Case of the goal:
(14) a. Kare-wa kenkoo da/na.
He-Top healthiness is.CON/is.ADN
‘He is healthy.’
b. kenkoo-na/da hito
helthiness-is.ADN/is.CON man
‘a healthy man’

This room-Top large-is.CON/is.ADN
‘This room is large.’
b. ooki-i/na heya
large-is.CON/is.ADN room
‘a large room’

In the present-day Japanese, (14b) and (15b) are the only relics of the adnominal inflection, and it can only occur with a modified nominal head external to it, such as hito ‘man’ in (14b) and heya ‘room’ in (15b). However, the adnominal inflection on the predicate was far richer in the classical Japanese, and in those days, the Genitive subjects were much more frequent than in the present-day Japanese, and they were possible even without a modified nominal head, as in (16), which is an example from a literary work that was compiled in the 10th century:

(16) embedded nominalized clause: Genitive Case = no:
Haru-no hajime-yori, Kaguyahime, tuki-no omosirou
spring-Gen beginning-from Kaguyahime, moon-Gen elegantly
ide-taru-o mi-te, tune-yorimo monoомoi-taru sama nari.
come.out-ADN-Acc look-and than.usual meditate-Perf. appearance be

(Taketori Monogatari; compiled on 900 A.D.)

(16) differs from the GSC in the present-day Japanese in that there is no overt nominal head external to the embedded clause that contains a Genitive subject; rather, the embedded verb is followed by an overt adnominal inflection -taru, which is immediately followed by an overt Accusative Case-marker. It is usually assumed that the adnominal inflection on C was the licensor of the Genitive Case in the classical Japanese (Frellesvig (2010)).

______________________________
1 CON is the abbreviation of the conclusive inflection on a verb/adjective, or “syusi-kei” in the traditional Japanese linguistics. ADN is the abbreviation of the adnominal form of a verb/adjective.
So far, we have seen that the syntactic environments in which a Genitive subject can be licensed have changed from (17a) through (17b) to (17c), where the Genitive Case-licensor as the probe is bold-faced and the licensed Genitive Case as the goal is italicized:

(17) a. \[
    [CP [TP [VP DP-Gen … NP … V] T] C (ADN=Gen)]
\]
    (CP had an adnominal inflection between the 10th to the 19th centuries)

b. \[
    [DP [CP [TP [VP DP-Gen … V] T] C (ϕ)] [NP D (Gen)]]
\]
    (“de-nominalization” of C from the late 19th to the early 20th century)

c. \[
    [DP [TP [VP DP-Gen … V] T] [NP D (Gen)]]
\]
    (clause shrinking in progress from the late 20th century on)

2.2. Possible Causes of Diachronic Change in NGC

Given that the licensor and the licensing environment of the Genitive subject has been changing broadly in the last 1000 years, and more narrowly within the last 100 years, one may well have at least two questions, which are arguably related to each other:

(18) a. What is the cause of the diachronic syntactic change?

b. How does language acquisition take place in the period in which such a diachronic language change is taking place?

Whatever approach you should take, it is clear that any theory of generative syntax that attributes language change to change in the value of some parameters will face the problem that Clark and Ian Roberts (1993) refer to as the logical problem of language change, as in (19):

(19) The logical problem of language change:
In the context of the idea that language change arises through the language acquisition process, the problem of why acquirers would converge on a system different from that which produces the primary linguistic data they are exposed to: if that system generates the data, how are acquirers led to postulate a distinct system?

(Clark and Roberts (1993); Roberts (2007: 451))

---

2 Ogawa (2018, 2019a), Niikuni, Wada and Ogawa (2017), and Ogawa, Niikuni and Wada (2018a,b) argue that the clause shrinking is going on further, making the GSC vP or VP/AP for the younger age groups.
(i) Dialect C: \[
    [DP [VP AP] DP-Gen V/A] V] [NP D_{Gen}]
\]
Dialect D: \[
    [DP [VP AP] DP-Gen V/A] [NP D_{Gen}]
\]
See these references for a detailed discussion.
As for an explanation to the cause of diachronic language change, both an internal cause model and an external one have been proposed. The former model views language change as taking place in the course of language acquisition, because of a language learner’s misanalysis or mislearning of the caretaker’s grammar, possibly as a result of abductive reasoning, and/or the lack of sufficient information in the PLD (Halle (1962), Andersen’s (1973), Harada (1971), Niyogi and Berwick (1997) or because of a child’s innovation (Cournane (2015, 2017)). Among them, in discussing the cause of the ongoing diachronic change from the Dialect A to B that supposedly took place in Japan some fifty years ago, Harada attributes it to a child’s potential failure to take over the caretaker’s grammar, due to the set of data available for the child being inevitably restricted in size and often degenerate in quality, as cited in (20):

(20) It seems that the cause of such a simplification lies in the fact that a child acquires his native language through “constructing the simplest (optimal) grammar capable of generating the set of utterances, of which the utterances heard by the child are a representative sample. Notice that the set of data available for the child is inevitably restricted in size and often degenerate in quality. Since the child constructs the optimal grammar that is consistent only with the original data, the grammar he constructs needs not be identical to the grammar that adults have constructed.

(Harada (1971: 36))

A similar idea, called “abductive change,” is also put forth by Andersen (1973), and more recently, Niyogi and Berwick (1997) put forth a dynamical-system-based approach to language learning, according to which mislearning could be the engine driving language change (ibid.: 715). Independently, Cournane (2015, 2017) put forth what is called the “Child Innovator Approach (CIA),” in which children’s innovations are a cause of language change.

The latter, external cause, model is to argue that some language changes are caused by frequency change in the competing constructions for whatever reasons. Although Kroch (2001) argues against analyzing frequency change as the direct cause of syntactic change, Lightfoot (1979, 1991, 1999), Lightfoot and Westergaard (2007), Yang (2002) and Snyder (2017) argue for this possibility, showing that the gradual loss of V2 constructions among the PLD for language learners triggered a parametric change or change in the selected micro-cues by the speakers of Middle English and Early Modern English.³ In fact, there could be cases in which

³ As for the gradualness of language change, then we can explain it without essentially abandoning the
the grammar competition in terms of frequency does not succeed in determining the final state of the grammar of the learner, but Yang (2002) suggests that even in such case, the general constraints on the learner, such as the “elegance” condition (an idea very similar to Harada’s (1971) idea in (20)), could enable the learner to choose one over the others, as in (21):

(21) The present model shares an important feature with Clark and Roberts’s (1993) work, which extends the use of Genetic Algorisms in acquisition (Clark 1992). In both models, the outcome of language acquisition is determined by the compatibilities of grammars with linguistic evidence, in a Darwinian selectionist manner. However, they identify the final state of acquisition with a single grammar. Therefore, when the linguistic evidence does not unambiguously identify a single grammar, they posit some general constraints on the learner, e.g. the ‘elegance’ condition, which requires the learner to select the simplest among conflicting grammars. (Yang (2002: 376))

As for the diachronic change that have been taking place in the GSC in Japanese, we will not choose between the “internal cause” model and the “external cause” model, because either model is compatible with our entire story; in fact, both factors may arguably be relevant. Anyway, it is important to note here that the gradual decline in the frequency of the Genitive subjects in the last 1000 years have been going on side by side with the gradual increase in the frequency of the Nominative subjects in the relevant environment. First, as shown in Figure 2, in the end of the 16th century, the sharp loss of the Genitive subject in all the clauses (not only adnominal clauses or the CP with an adnominal inflection but also the indicative complement clauses or root clauses) co-occurred with the sharp increase of the Nominative subjects in the relevant environment. But it is observed that the sharp decrease of Genitive subject that took place between the 14th and 16th centuries was due to the spread of the overt Nominative Case-marking from the subordinate clause to the matrix clause, whose subject had previously been zero-marked (Kinsui et al. (2011)):
The further decline of Genitive Case in the 18th to 19th centuries is often attributed to the decline of adnominal inflection on C and the emergence of an overt nominal complementizer *no*, which is immediately followed by an overt Case-marker *ga ni/o* or the Topic-marker *wa*, as in *no-ga, no-ni, no-o*, and *no-wa*, that took place in the period, as shown in Figure 3.\(^4\)

---

\(^4\) The data in Figures 1 and 2 are based on the corpus data available from Japanese Historical Corpus released from the National Institute for Japanese Language and Linguistics (NINJAL).
Moreover, Ogawa (2016) observes that in the 20th century, during which the frequency of the Genitive subjects in an adnominal clause was also steeply declining, the frequency of the Nominative subjects in the same syntactic environments was gradually increasing, as shown in Figure 4:

![Figure 4: The frequency of NSCs and GSCs per million characters](image)

Thanks to these data, we can conclude that the gradual loss of Genitive subjects in the last 1000 years can be attributed to the gradual increase of Nominative subject first in the matrix clause and next in the embedded clause, and the replacement of the nominalized clauses headed by an adnominal inflection on C by the overtly adnominal “de-nominalized” clauses.

2.3. An Interim Summary

In this section, we have argued that the syntactic environments in which a Genitive subject is available have changed in the last 1000 years, due to the gradual loss of adnominal inflection on C, and then changed in the last 100 years, due to the clause shrinking from CP to TP. In the course of the successive syntactic change, the functional category C changed from a mixed nominal category to a purely verbal one, and accordingly, the nominalized clause that does not require an external noun phrase was totally replaced by an adnominal clause that requires an external noun phrase. These changes can be referred to as “diachronic de-nominalization.”

As a result of the diachronic de-nominalization, the frequency of Genitive subjects in certain
environments (as in the adnominal CP with an overt complementizer or adnominal inflection) steeply decreased, though Genitive subjects have been used in a clause whose predicate is stative, such as a stative verb or an adjective, as shown in Tables 1 and 2. As a result of this gradual change, the predicates whose subject is in the Genitive Case have been more and more stativized, while the more eventive the predicates are, the more frequently the subject is going to be marked for the Nominative Case (Ogawa (2018)).

<Figure 5: the GSC with a semelfactive eventive verb vs. stative verb>

The existence of two dialects Harada (1971) acknowledged in terms of the lower acceptability of GSCs in the Adjacency Condition and the Nominal Copula Condition for younger age groups that was found some forty-five years ago was probably due to the fact that as a result of syntactic change from (12a) to (12b) the co-occurrence of a Genitive subject and an overt complementizer and/or the occurrence of a Genitive subject in the above-mentioned two conditions became impossible, due to the lack of the syntactic space that host these functional words and syntactic transformations that need the CP domain (cf. Ogawa (2019a)).

In the next section, we will see another type of diachronic de-nominalization that has been occurring in relation to the Genitive subject licensing, which is a case of the GSCs licensed in a formal noun phrase.

3. Genitive Subjects in Formal Noun Phrases and Grammaticalization

Among the GSCs, we have so far seen only examples of CPs with adnominal inflections and adnominal clauses which are essentially identified with relative clauses. However, there is another type of adnominal clause, which takes place in the complement of a formal noun.
Formal noun is different from common noun in that it is non-referential by itself and is morphologically suffixal in nature (Masuoka and Takubo (1992)). In English, -one of everyone, someone and -body of somebody everybody, nobody are examples of formal nouns.

In Japanese, there are at least twenty times as many formal nouns as there are in English, many of which are commonly used in our daily lives. Probably, this is related to the shortage of nominalizing suffixes in Japanese, as opposed to the long and large list of nominalizing suffixes in English.

Anyway, the GSC can be licensed in examples like (22a–c), where koto ‘fact’, tokoro ‘place’ and hazu ‘probability’ are formal nouns (FN):

\[
(22) \begin{align*}
\text{a.} & \quad [\text{Kyoo Taro-\text{ga/no} kuru koto]-wa dare-mo sira-nai.} \quad (\text{koto} = \text{FN}) \\
& \quad \text{Today Taro-Nom/Gen come fact-Top any-MO know-Neg}
& \quad \text{‘Nobody knows that Taro will come today.’} \\
\text{b.} & \quad [\text{Taro-\text{ga/no} sunde-iru tokoro]-de ookina zisin-ga oki-ta.} \quad (\text{tokoro} = \text{FN}) \\
& \quad \text{Taro-Nom/Gen live-Prog place-at large earthquake-Nom took.place}
& \quad \text{‘A large earthquake took place where Taro lives.’}
\text{c.} & \quad [\text{Koko-ni Taro-\text{ga/no} iru]-hazu-ga nai.} \quad (\text{hazu} = \text{FN}) \\
& \quad \text{here-in Taro-Nom/Gen is-probability-Nom Neg}
& \quad \text{‘There is no probability that Taro is here./It is improbable that Taro is here.’}
\end{align*}
\]

As the translations to English show, the same meanings can be expressed in English without a formal noun, and yet, in such an environment Japanese uses a formal noun in order to nominalize a clause and place the complex of a clause and a formal noun in an argument position.

Although both the Genitive subjects in a relative clause and those in a clausal complement to a formal noun have been progressively decreasing in the last 100 years, it is notable that the latter is more sharply decreasing than the former, as shown in Figure 6:
As an instance of the GSC in complement to a formal noun, let us consider the case in (22c): the formal noun is the modal noun hazu ‘probability’. Although the Japanese Historical Corpus (JHS) released from NINJAL shows that most of the formal nouns in Japanese were already found in the Heian period (about 10th to 13th centuries), hazu as a formal noun is peculiar in that it first appeared on the corpus in the 18th century.

Irrespective of when it began to be used, we assume that the structure for the unmarked cases of Genitive subjects licensed by a formal noun is (23), where the formal noun is categorially a nominalizer that selects TP as its complement:

(23)

At this point, however, the formal noun has already been grammaticalized from a lexical noun, as hazu (筈) was originally a common noun that means “the nock of an arrow.” As the edge of an arrow must fit well with a nock in order for it to fly well, a modal meaning of a
The speaker’s epistemic modality was derived as a result of grammaticalization, because the meaning of physical contact between two things can easily undergo metaphorical extension so as to mean that the speaker’s prediction about some future event must fit with the actual future event. In any event, it is reasonable to assume that any formal noun, when it begins to be used, is already of a functional category (i.e. nominalizer).

But, as a formal noun continues to be used frequently as a formal noun, it tends to undergo secondary grammaticalization (Brinton and Traugott (2005)). As a result, formal nouns are decategorized to complementizer/conjunctive marker, as easily illustrated by examples like while:

(24) a. for a while, a long while, a good while, all the while, between whiles, etc.
    b. While you were in the house, the earthquake occurred.
    c. While you are for the Act, we are against it.

The word *while* is currently almost always used as a complementizer/conjunctive marker meaning “temporal coincidence” or “adversative conjunction” and it can never be preceded by the definite article or an adjective as in *the while* and *a boring while*, it was originally a common noun meaning ‘time,’ and the uses in (24a) are the relic of its original nominal uses.

Something similar happened to *hazu* too: its use as a common was observed from the 16th century, but it began to be used as a formal noun selecting a clause from the late 18th century, and among its modal use, it was originally used exclusively as a positive polarity item (PPI), as in (25a), but later it came to be used as a negative polarity item (NPI) too, as in (25b):

(25) a. 田舎者の目にも短は合点のゆかねはづなり。 (c.1686; 好色一代女)
    Inakamono-no me-ni-mo kore-wa gaten-no yuka-nu hazu nari.
    contryman-gen eye-on-also this-top grasp-gen go-neg probability is
    ‘It will probably be the case that this doesn’t wash with a countryman.’
    b. 男が茶屋者請け出す、其応せぶはづがない (c.1720; 心中天の綱島)
    otoko-ga chayamono ukedasu, sono, hiiki-seu hazu-ga nai
    man-nom harlot ransom its help-do probability-nom neg
    ‘It is improbable that I would help a man ransom a harlot.’

In both the constructions in (25a,b), when they began to be used some 300 years ago, they accepted both Nominative and Genitive subjects, but for the contemporary native speakers of Japanese, a Nominative Case is available for the subject of the embedded verb, but the Genitive
Case is less acceptable in both (26a) and (26b), and the positive polarity sentence in (26a) is far less likely to accept a Genitive Case than the negative polarity sentence in (26b).

(26) a. Taroo-ga/*no kuru hazu da.  
   Taroo-Nom/Gen come probability COP  
   ‘It is highly probable that Taro will come.’

b. Taroo- ga/??no kuru hazu-ga nai.  
   Taroo- Nom/Gen come probability-Nom Neg  
   ‘It is improbable that Taro will come.’

Table 5-1: Frequency of [-no/ga + {V/A} + hazu + Particle + nai]

<table>
<thead>
<tr>
<th>Years of publication</th>
<th>Edo</th>
<th>Meiji-Taisho</th>
<th>Showa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Words Compiled (M)</td>
<td>0.624</td>
<td>13.97</td>
<td>2.23</td>
</tr>
<tr>
<td>~no + V/A + hazu + Particle + nai</td>
<td>3</td>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td>PER MIL</td>
<td>4.81</td>
<td>2.08</td>
<td>0.57</td>
</tr>
<tr>
<td>~ga + V/A + hazu + Particle + nai</td>
<td>1</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>PER MIL</td>
<td>1.60</td>
<td>1.43</td>
<td>3.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.85</td>
</tr>
</tbody>
</table>

What is more, the Nominative Case assigned to the matrix subject of the negative polarity sentence can be more likely to be dropped, as in (27), where the Genitive Case assigned to the embedded subject is as unacceptable as (26a):

(27) Taroo- ga/*no kuru hazu nai.  
    Taroo- Nom/Gen come probability Neg  
    ‘It is improbable that Taro will come.’

Table 5-2: Frequency of the reduced forms Hazu-aru/Hazu-nasi/Hazu-arimasen

<table>
<thead>
<tr>
<th>years</th>
<th>1864</th>
<th>1874–1925</th>
<th>1970s</th>
<th>1980s</th>
<th>1990s</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>hazu-nai/hazu-nasi</td>
<td>0</td>
<td>22</td>
<td>3</td>
<td>11</td>
<td>48</td>
<td>130</td>
</tr>
<tr>
<td>hazu-ari(masen)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>計</td>
<td>0</td>
<td>22</td>
<td>3</td>
<td>14</td>
<td>50</td>
<td>141</td>
</tr>
<tr>
<td>PER MIL</td>
<td>0.00</td>
<td>1.58</td>
<td>1.35</td>
<td>1.62</td>
<td>2.39</td>
<td>1.93</td>
</tr>
<tr>
<td>Words compiled (M)</td>
<td>3.57</td>
<td>13.97</td>
<td>2.23</td>
<td>8.64</td>
<td>20.95</td>
<td>73.10</td>
</tr>
</tbody>
</table>
In this way, the clausal complement to the formal noun *hazu* is becoming less and less likely to accept a Genitive subject, and the process goes on in tandem with the lexicalization of *hazu-ga-nai* into *hazu-nai* (Kishimoto and Booij (2014)). We will claim that this change is a secondary grammaticalization of the formal noun *hazu* toward a pure modal auxiliary in the complementizer domain, which is another kind of “de-nominalization.”

In fact, the “de-nominalization” of formal nouns in Japanese in the last 100 years is not limited to *hazu* but applies to many other formal nouns in Japanese. We saw in (22a,b) that *koto* and *tokoro* are formal nouns that can license a Genitive subject. But Table 6 shows that in the last 150 years, they have developed aspectual or modal uses as in (28) and (29), which show that they cannot license a Genitive subject:

(28) a. koto-ni-wa (= unless; negative conditional):

Kimi-ga/*no ko-nai koto-ni-wa, kaigi-wa hajimara-nai.

You-Nom/Gen come-Neg fact-at-Top meeting-Top begin-Neg

‘Unless you comes, the meeting will not start.’

b. koto-ga-dekiru (= can; root possibility):

Kono apaato-ni-wa, koureisha-ga/*no sumu koto-ga dekiru.

This apartment.house-at-Top the.old.folk-Nom/Gen live fact-Nom can

‘Even the old folks can live in this apartment house.’

(29) a. Ima + V-Past + tokoro-da (= has just V-en; present perfective)

Ima, Taro-ga/*no kaetteki-ta tokoro da.

now Taro-Nom/Gen come.back-Past place is

‘Taro has just come back.’

b. V+Past+tokoro-de (= even if; concessive conditional):

Kimi-ga/*no kita tokoro-de, kono mondai-wa kaiketu-si-nai.

You-Nom/Gen came place-at this problem-Top solution-do-Neg

‘Even if you come, this problem will not be solved.’
Table 6. The frequency of formal nouns that cannot license Genitive subjects

<table>
<thead>
<tr>
<th></th>
<th>Years/Centuries</th>
<th>10th–17th</th>
<th>18th</th>
<th>1874–1925</th>
<th>1970s–2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>V+ru+koto-ga-dekiru</td>
<td></td>
<td>0</td>
<td>0</td>
<td>70</td>
<td>20,812</td>
</tr>
<tr>
<td>V+ru+koto-ni-naru</td>
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<td>0</td>
<td>0</td>
<td>399</td>
<td>13,338</td>
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<tr>
<td>V+ta+koto-ni-wa,</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>215</td>
</tr>
<tr>
<td>V+ru+tokoro-da.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>267</td>
</tr>
<tr>
<td>V+ta+tokoro-da.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>177</td>
</tr>
<tr>
<td>V+ta-tokoro-de,</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1,748</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>0</td>
<td>0</td>
<td>478</td>
<td>36,557</td>
</tr>
<tr>
<td>Frequency (PER MIL)</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
<td>34.2</td>
<td>348.5</td>
</tr>
<tr>
<td>Compiled words (M)</td>
<td></td>
<td>101</td>
<td>22</td>
<td>1,397</td>
<td>10,491</td>
</tr>
</tbody>
</table>

Given these facts, the impossibility of a Genitive subject in (27) to (29) can also be attributed to the fact that *hazu*, *koto* and *tokoro* in their modal or aspectual uses have been totally grammaticalized and decategorized into a modal auxiliary, having lost their nominal feature that could license a Genitive Case, as in (30a,b):

\[
\begin{align*}
(30) & \quad \text{a.} & & \text{b.} \\
& & \text{NegP/CP} & & \text{CP} \\
& & \text{ModP} & & \text{Neg/C} \\
& & \text{TP} & & \text{Mod} & \text{nai/da} \\
& & \text{vP} & & \text{TP} & \text{Asp} & \text{da} \\
& & \text{T} & & \text{hazu} & & \text{tokoro} \\
& & \text{Subj} & & \text{v} & & \text{v} \\
& & \text{[Nom/*Gen]} & & \text{[Nom/*Gen]} \\
& & \text{VP} & & \text{vP} & & \text{v} \\
& & & & \text{v} & \text{v} & \text{v} \\
& & & & \text{Obj} & \text{V} & \text{Obj} & \text{V}
\end{align*}
\]

Now that *hazu*, just like many other formal nouns, has been undergoing grammaticalization into a modal auxiliary and losing its nominal feature and that the categorial shift has been gradually taking place in the last 100 years, we predict that the younger age groups are less and less likely to accept a Genitive subject in the complement of *hazu*. The test we administered against hundreds of people ranging from their 20s to 70s shows that this prediction is indeed borne out. See sections 5.1 and 6.1 for the experiment, result, and discussion.
4. Nominalization of Coordination/Juxtaposition and Constructionalization

A third type of NGC can be illustrated in (31a-f), where either a Genitive or Nominative Case appears on the subject of conjoined (= 31a,c,e) or juxtaposed (= 31b,d,f) verbs/adjectives, where neither verbs nor adjectives are overtly nominalized. This is a relatively newer construction that began to appear on the Japanese historical corpus in the late 19th century, compared with the NGC in the complement of a formal noun, which was already observed in the 10th century, and the standard NGC in (1), which has been found since the 8th century:

(31) a. Taro-no\text{-}ga \text{iru}_{V} \text{to} \text{inai}_{A} \text{to-de/niyotte, ...} \quad <no*/ga \rightarrow \text{no}/ga>
   Taro-Gen/Nom is \text{Conj is-not} \text{ Conj-with/depending.on}
   ‘Depending on whether Taro is present or not, ...'

b. Taro-no\text{-}ga \text{iru}_{V} \text{inai}_{A} \text{de/niyotte, ...}
   Taro-Gen/Nom is \text{is-not} \text{ with/depending.on}
   ‘Depending on whether Taro is present or not, ...'

c. Koe-no\text{-}ga \text{ookii}_{A} \text{to} \text{chiisai}_{A} \text{to-de/niyotte, ...}
   voice-Gen/Nom large \text{ Conj} small \text{ Conj-with/depending.on}
   ‘Depending on whether voice is loud or small, ...'

d. Koe-no\text{-}ga \text{ookii}_{A} \text{chiisai}_{A} \text{de/niyotte, ...}
   voice-Gen/Nom large small \text{ with/depending.on}
   ‘Depending on whether voice is loud or small, ...'

e. Bukka-no\text{-}ga \text{agaru}_{V} \text{to} \text{sagaru}_{V} \text{to-de/niyotte, ...}
   price-Gen/Nom raise \text{ Conj} lower \text{ Conj-with/depending.on}
   ‘Depending on whether the price goes up or down, …’

f. Bukka-no\text{-}ga \text{agaru}_{V} \text{sagaru}_{V} \text{de/niyotte, ...}
   price-Gen/Nom raise lower \text{ with/depending.on}
   ‘Depending on whether the price goes up or down, …’

The coordinator to ‘and’ is elsewhere used only to combine two or more nouns or noun phrases, as in (32), and coordination of two verbs or verb phrases is otherwise mediated by other coordinators such as te, ri, or si, and coordination of two adjectives or adjective phrases is otherwise mediated by the coordinators te or si, as in (33) and (34):

(32) a. Sakana to niku-o taberu. <NP & NP>
   fish and meat-Acc eat
‘to eat fish and meat’

b. *kuroi to chiisai kasa <AP & AP>
black and small umbrella
‘a black and small umbrella’
c. *Sakana-o taberu to osake-o nomu(-to)-toki <VP & VP>
fish-Acc eat and sake-Acc drink(-and)-when
‘when (you) eat fish and to drink sake’

(33) a. Sakana-o tabe-te osake-o nomu. <VP and VP>
fish-Acc eat-and sake-Acc drink
‘to eat fish and (thereafter) drink sake’

fish-Acc eat-Past-and sake-Acc drink-Past-and do
‘to repeat eating fish and drinking sake’

c. Sakana-o tabe-ru-si osake-mo nomu.
fish-Acc eat-Nonpast-and sake-also drink
‘to eat fish and also drink sake’

(34) a. akachan-wa chiisaku-te kawaii. <AP & AP>
Baby-Top small-and pretty
‘Babies are small and pretty.’

b. akachan-wa chiisai-si kawaii.
Baby-Top small-and pretty
‘Babies are small and (also) pretty.’

In (31a), however, one verb and its negated form are coordinated by the mediation of the otherwise nominal coordinator to.

The coordinated phrase in (31a) is nominal, both internally and externally. It is internally nominal, because each conjunct is coordinated by the nominal coordinator, as said above, and it is externally nominal too, as the phrase is immediately followed by an adposition ni-yotte or de, both meaning ‘depending on’, which exclusively takes a nominal complement.

In addition, the fact that the common subject of a verb in each conjunct can be marked with a Genitive Case also shows that not only the coordinated structure as a whole but also each conjunct is of a nominal category; in other words, there is a nominal functional category inside the coordinated structure.
From a diachronic perspective, the constructions in (31a,b) are different from the two cases we saw in the previous sections in the following two respects:

(35) a. The coordinated form in (31a,c,e) is a relatively newer construction than (31b,d,f), in that examples of the type in (31a) first appears on the Japanese historical corpus on late 19th century (= (36)).

b. Even in (31b,d,f), the morphological Genitive Case (no) was the only form possible in the classical Japanese, and the morphological Nominative Case (ga) is a newer variant.

(36) 其男と此人形とは。精神のあるとなきとの違のみなりしが。
Sono otoko to kono ningyou to-wa.
That man and this doll to-Top
Seisin-no aru to naki to-no chigai-nomi nari-si ga.
Spirit-Gen be and be.not and-Gen difference-only be-Past yet
‘The man and the doll. The only difference is whether it has a spirit or not, and yet …’
(c.1888, 国民之友)

For these reasons, we will provide them with a different analysis than the previous ones. More specifically, we propose that the juxtaposition in (31b) was derived from the following compounds (dvandvas) of antonymous elements, by the diachronic process that Ogawa (2014) refers to as “syntactic constructionalization”, whose definition we will introduce in (41) and (42) below, as the technical details are irrelevant here:

(37) a. ude-\textit{no}/*ga yoshi_{A-ashi_{A}} (A & A)
skill-Gen/*Nom good-bad
‘whether one’s skill is good or bad’

b. zaisan-\textit{no}/*ga aruv-nasi_{A} (V & A)
property-Gen/*Nom be-not.be
‘whether one has enough property or not’

c. te-\textit{no}/*ga age-sage (V & V)
hand-Gen/Nom raise-lower
‘the raising and lowering of a hand’

At the first stage of the syntactic constructionalization, as in (36), no Nominative Case is
available, and therefore, this is an instance of compound created by the direct merger between one verb or adjective and another one that has an antonymous semantics. For example, in (37a), ashi ‘bad’ is an antonymous adjective of yoshi ‘good’; in (37b), nasi or nai ‘not-be’ is an adjective that is the semantic reversal of the verb aru ‘be’. Yoshi-ashi and aru-nasi are nominal dvandvas, although there is no nominal subcomponent in them; in (37c), sage(ru) ‘to lower’ is the antonymic verb of age(ru) ‘to raise’. In this sense, they are instances of what Scalise, Fábregas and Forza (2009) call “exocentric compounds.” Note that the adjective or verb used in (36) cannot be independently used as a noun, as is clear from the ill-formedness of the following examples:

(38) a. * ude-no yoshi /*ude-no asi
    b. * zaisan-no aru /*zaisan-no nasi
    c. * te-no age /*te-no sage

Hence, the formation of the dvandva compounds must be a necessary condition for their nominal character. Scalise et al. argue that the compounding of antonymous non-nominal elements leading to a nominal category is a cross-linguistically prevalent phenomenon, so that there should be a semantic universal that enables this categorial shift.5

Whatever the cause of the nominal nature of the exocentric compounds, however, we argue that their analysis of dvandvas is short-handed for two reasons: first, it is not applicable to the phrasal constructions in (31); second, it cannot explain the process of diachronic development of the antonymic dvandva.6

The second point is shown by the fact that the juxtaposed construction in (37a-c) was

5 The examples Scalise, Fábregas and Forza (2009) show are like the following:
   (i) V-V compounds of antonyms:
       a. lava-asciuga ‘(Lit) washV + dryV (= washing machine)’ (Italian)
       b. subibaja ‘(Lit) climbV + descendV (= liftN)’ (Spanish)
       c. yapboz ‘(Lit) constructV + destroyV (= jigsaw puzzle)’ (Turkish)
   (ii) A-A compounds of antonyms:
       a. dàxiāor ‘(Lit) bigA + smallA (= size)’ (Chinese)
       b. chángduān ‘(Lit) longA + shortA (= length)’ (Chinese)
       c. shenqian ‘(Lit) deepA + shallowA (= depth)’ (Chinese)

6 A similar construction that can be licensed only under coordination is also observed in English, as in (i), but expressions like these are unproductive and lexically limited, so we assume that “syntactic constructionalization” in the sense to be defined below has not yet occurred in English.
traditionally very limited in both type- and token-frequencies, but it has been increasing the two types of frequencies in the last 150 years or so. For example, in the Heian Era (between the 10th to 13th centuries), only six types, *aru-nasi/ari-nasi* ‘be-not.be’, *iki-ki* ‘go-come’, *kati-make* ‘win-lose’, *yoshi-ashi* ‘good-bad’, *takaki-iyasiki* ‘respectable-mean’, and *kiyosi-Kitanaki* ‘clean-dirty’ were found on the Japanese Historical Corpus (JHC). In the Kamakura Era (between the 13th to 15th centuries), only three types, *ari-nasi*, *iki-ki*, and *yoshi-ashi* ‘good-bad’ were found on JHC. A similar state of affairs continues up to the Edo Era (between the 17th to 19th centuries). From the Meiji Era (between the late 19th to early 20th centuries) on, however, both the type- and token frequencies of the antonymous compounds are sharply increasing, with the V-V compounds in the highest increase and the A-A compounds in the second highest increase (V-A compounds of the *aru-nasi* ‘be-not.be’ type is relatively steady). Table 7 shows that the frequency of V-V/V-A/A-A compounds composed of mutually antonymous words are gradually increasing in the last 150 years after the Meiji/Taisho era, both in terms of type frequency and token frequency (in order to level the irregular up-and-low effects of Kamakura, Muromachi and Edo eras that could appear due to the far smaller number of words compiled in each of these eras, we have averaged up the numbers of the three eras):
<table>
<thead>
<tr>
<th></th>
<th>Heian-Edo</th>
<th>Meiji-Taisho</th>
<th>Showa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Words compiled (M)</td>
<td>3.39</td>
<td>14.73</td>
<td>10.86</td>
</tr>
<tr>
<td>type frequency (V&amp;V-Neg/A)</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>token frequency (V&amp;V-Neg/A)</td>
<td>6</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td><strong>PER MIL</strong></td>
<td><strong>1.90</strong></td>
<td><strong>0.35</strong></td>
<td><strong>0.55</strong></td>
</tr>
<tr>
<td>e.g. ~no aru-nasi/ari-nasi/aru-nai (be-not.be), ~no iru.inai (have-not.have), ~no isiki.suru.sinai (aware-not.aware)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>type frequency (V1&amp;V2)</td>
<td>3</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>token frequency (V1&amp;V2)</td>
<td>12</td>
<td>66</td>
<td>61</td>
</tr>
<tr>
<td><strong>PER MIL</strong></td>
<td><strong>3.79</strong></td>
<td><strong>4.66</strong></td>
<td><strong>5.62</strong></td>
</tr>
<tr>
<td>e.g. ~no iki.ki (go-come), ~no kati.make (win-lose), ~no de.iri (go.out-go.in), ~no age.sage (raise-lower), ~no yomi.kaki (read-write), ~no ne.oki (sleep-wake.up)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>type frequency (A1&amp;A2)</td>
<td>5</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>token frequency (A1&amp;A2)</td>
<td>14</td>
<td>26</td>
<td>13</td>
</tr>
<tr>
<td><strong>PER MIL</strong></td>
<td><strong>4.42</strong></td>
<td><strong>1.83</strong></td>
<td><strong>1.20</strong></td>
</tr>
<tr>
<td>e.g. ~no yoshi.ashi/ashiki-yoki (good-bad), ~no hayai.osoi (early-late), ~no ookii.chiisai (large.small), ~no atsui.samui (hot-cold), ~no umai.mazui (delicious.unsavory)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>type frequencies in total</td>
<td>10</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>token frequencies in total</td>
<td>32</td>
<td>96</td>
<td>80</td>
</tr>
<tr>
<td><strong>PER MIL in total</strong></td>
<td><strong>10.11</strong></td>
<td><strong>6.52</strong></td>
<td><strong>7.37</strong></td>
</tr>
</tbody>
</table>

<Table 7: the frequency of dvandva V-A/V-V/A-A compounds that combine antonymous words>

Table 8 shows that the frequency of V-to-A-to/V-to/V-to/A-to-A-to coordination that combine antonymous words started from a Genitive subject and then has extended to the Nominative subject from the Meiji-Taisho era on, replacing the Genitive subject construction:
Table 8: the frequency of Genitive/Nominative subject + V-to-A-to/V-to-V-to/A-to-A-to

coordination that combine antonymous words in each era

<table>
<thead>
<tr>
<th></th>
<th>Heian-Edo</th>
<th>Meiji-Taisho</th>
<th>Showa</th>
</tr>
</thead>
<tbody>
<tr>
<td>900~1864</td>
<td>3.39</td>
<td>14.73</td>
<td>10.86</td>
</tr>
<tr>
<td>1874~1925</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>1970~80s</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1990-2000s</td>
<td>0.29</td>
<td>0.95</td>
<td>0</td>
</tr>
<tr>
<td>token frequency</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>~no V1-to-V1(zaru,naï)-to</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>~no aru-to-naï-to</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>~no A1-to-A2-to (antonymous)</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>PER MIL</td>
<td>0.00</td>
<td>0.07</td>
<td>0.18</td>
</tr>
</tbody>
</table>

From these corpus data, it is reasonable to argue that the increase in the type frequency of the antonymous compounds was the trigger for them to undergo constructionalization and come to accept a freer combination of antonymous words and even phrases, and result in the development of the phrasal coordination and juxtaposition as schematized in (31a,b).

For these reasons, we will propose a syntactic account. More specifically, we claim that each conjunct in the coordinated and juxtaposed constructions in (31a-f) is syntactically nominalized in a way similar to “zero derivation.” As for zero derivation, two major analyses have been proposed: one is Lieber’s (1992) relisting analysis, and the other is Don’s (2005) syntactic zero-affixation analysis. Among these two possibilities, we follow Don’s analysis based on distributed morphology.

Given distributed morphology, we assume that exocentric antonymous compounds in (37a-c) have the syntactic structure in (39), while the juxtaposed antonyms in (31b, d, f) will have either of the structures in (40a,b). (39) and (40a) differ in terms of where in the juxtaposed structure nP is and whether the Genitive subject is external or internal to the compounds; (40a) and (40b) differ in terms of whether TPs are juxtaposed and a Genitive subject is licensed or CPs are juxtaposed and a Nominative subject is licensed: 7

---

7 The subject of the second clause in (40a,b) is pro, which cannot be replaced by an overt subject, because Japanese is a pro-drop language and the Avoid Pronoun Principle (Chomsky (1981)) will prevent a pronoun from being realized overtly when it can be phonetically empty.
Now, let us propose the cross-linguistic diachronic process of “syntactic constructionalization,” which is a mechanism of diachronically building a more complex phrase structure by adding more functional categories on the root, according to the universal principle of structure building and selection, in the spirit of cartography (cf. Rizzi (1996); Cinque (1999, 2006)). The definitions of “syntactic construction” and “syntactic constructionalization” are given in (41) and (42), respectively (Ogawa (2014)):

(39)
\[
(\text{Gen}) \quad nP^g \quad \text{Subj} \quad n' \quad \sqrt{\sqrt{A/V}} \quad \sqrt{\sqrt{A1/V1}} \quad \sqrt{\sqrt{A2/V2}}
\]

(40) a.
\[
(\text{TP}) \quad nP \quad \text{Subj} \quad n' \quad \text{vP} \quad \text{T} \quad n \quad \text{TP} \quad \text{vP} \quad \text{T} \quad \text{vP} \quad \text{T} \quad \text{vP} \quad \text{T}
\]

b.
\[
(\text{CP}) \quad nP \quad \text{Subj} \quad n' \quad \text{TP} \quad \text{C} \quad n \quad \text{CP} \quad \text{TP} \quad \text{C} \quad \text{TP} \quad \text{C} \quad \text{TP} \quad \text{C} \quad \text{TP} \quad \text{C} \quad \text{TP} \quad \text{C}
\]

8 In the recent trend of distributed morphology, there has occurred an issue of whether an internal argument of a verb is licensed by a non-categorized root (Harley (2009)) or a categorizer (Borer (2005), Basilico (2008), Nishiyama and Ogawa (2014)). If the Genitive subject in (39) can be an internal argument of the verbal or adjectival root, it would mean that the verbalizer is not necessary to syntactically realize an internal argument of a verbal root. However, if nominalizer, as well as verbalizer can license an internal argument of a verbal root, the fact will not allow us to choose one analysis over the other. An argument relevant to this is presented by McIntyre (2019), who shows that there are zero-derived nominals that can support an internal argument and ones that cannot, as in (ia,b), respectively:

(i) a. their frequent \{exchange/release/murder/torture/capture\} of prisoners
b.*his kick (of the dog), my aid (*of Ann), a fix (%of the problem)
(41) Syntactic Construction:

If a morphosyntactic constituent that dominates two or more morphemes (Y₁, . . . , Yₙ, X) (n ≥ 1, X = head) contains at least one variable Yᵢ, call it a Syntactic Construction. Yᵢ is qualified as a variable iff there are at least two candidates for substituting Yᵢ in combination with a particular head X.

(42) Syntactic Constructionalization (cf. slightly modified from Ogawa (2014)):

When a syntactic constituent, which was not a syntactic construction at the earliest stage, becomes a minimal syntactic construction (i.e. with only one variable and one categorizer) at a later stage, and comes to have more than one variable and/or more functional categories than ever and possibly enlarges the size of its syntactic constituent in a unidirectional fashion, in a way in accordance with the universal principle of structure building, functional hierarchy, and category selection.⁹

Given (41)-(42), compare the structures in (39), (40a), and (40b). It is then immediately clear that (40a) has more functional categories in it than (39), and that (40b) has more functional

⁹ The idea of “Syntactic Constructionalization” presupposes that syntactic realization of functional categories across languages is subject not to the strong version but to the weak version of the Structural Uniformity Hypothesis (SUT), which Thráinsson (1996: 255) defines as follows:

(i) Clause architecture is determined by UG in the sense that UG defines a set of functional categories, \{F₁, F₂, ..., Fₙ\}, that languages “select” from. For any functional categories Fᵢ and Fⱼ, the sequence will be uniform whenever they occur, i.e. if L₁ and L₂ each instantiate both Fᵢ and Fⱼ and Fᵢ c-commands Fⱼ in L₁, then Fⱼ c-commands Fᵢ in L₂.

While (i) is compatible with Rizzi’s (1997) and Cinque’s (1999) cartography, (i) allows, for example, the functional categories Agr and T to be fused in a language, while they can be separately projected in a designated hierarchy in another language. Applying this idea to (42), (i) would also imply that in some stage of a language in which syntactic constructionalization has been advanced, Fᵢ and Fⱼ are separatedly projected in a syntactic construction as in (iia), while in its diachronically earlier stage in the same language Fᵢ and Fⱼ would have been fused as in (iib):

(ii) a. \[ [FᵢP Fᵢ [FⱼP Fⱼ [L P ...]]] \] (syntactically more constructionalized)
   b. \[ [Fᵢ+ⱼP Fᵢ+Fⱼ [L P ...]] \] (syntactically less constructionalized)

However, the original idea behind (42), as Ogawa (2014) argues, is to account for the diachronic development of functional projections in such a way that (iia) is developed from (iib), where (iiiia) contains more functional projections than (iib) and the hierarchical relation between Fᵢ and Fⱼ is universal across languages:

(iii) a. \[ [FᵢP Fᵢ [FⱼP Fⱼ [L P ...]]] \] (syntactically more constructionalized)
   b. \[ [FⱼP Fᵢ [L P ...]] \] (syntactically less constructionalized)

This means that Fᵢ in this construction is simply unrealized in an earlier stage of the language, even if it might be realized in another construction of the same language. This is not unusual in a single language, as the ECM complement in English is TP even if a finite and control infinitive complements are CP in English, and this is not unusual among a single construction across languages too, as the ECM complement is TP in English, though it is CP in Italian, French and Japanese. What is important in (42) is, however, a diachronic relation between (iiiia) and (iib), which has not frequently been observed across languages. See Ogawa (2014, 2019b) for a few illustrations of the diachronic development of certain constructions in Japanese and English from (iib) to (iiiia) or to a more complex structure.
categories in it than (40a). Hence, the progressive course of syntactic constructionalization that took place is assumed to be a change from (39) to (40a) and a subsequent change from (40a) to (40b). In fact, the diachronic development of constructions that actually took place some 100 years ago were along what is predicted by the mechanism of syntactic constructionalization.

Now, let us focus on (31a,c,e), the coordination of antonyms. (31a,c,e) differs from (31b,d,f) in that the overt coordinator mediates between the antonyms. In this case, we also need to explain why the nominal coordinator to, which can only conjoin two or more nominal elements, can occur here, despite the fact that what are conjoined is either verbs or adjectives. Thus, we assume that each conjunct in this construction is nominalized before coordination. The structure of (31a,c,e) will then be shown in (43a) and (43b), depending on whether the subject is marked for a Genitive or Nominative Case:\(^{10}\)

\[
(43) \quad \text{a.} \quad \begin{array}{c}
\text{&P} \\
/ & / \\
\text{TP} & \text{n} & \text{n} \\
\text{&'} & \text{to} & \text{&'} \\
\text{vP} & \text{T} & \text{TP} \\
\text{Subj} & \text{v'} & \text{vP} \\
\text{[Gen]} & \text{v} & \text{pro}_{1} \\
\text{VP} & \text{v'} & \text{v} \\
\end{array}
\]

\[
\text{b.} \quad \begin{array}{c}
\text{&P} \\
/ & / \\
\text{TP} & \text{n} & \text{n} \\
\text{&'} & \text{to} & \text{&'} \\
\text{TP} & \text{n} & \text{n} \\
\text{Subj} & \text{T'} & \text{T} \\
\text{[Nom]} & \text{T} & \text{T} \\
\end{array}
\]

---

\(^{10}\) Actually, there are two coordinators in the A-to-B-to construction. As for the second coordinator here, there is a technical way to accommodate it syntactically, as in (i), which also explain cases in which more than two conjuncts occur in a coordinated structure:

\[(i) \quad [&P_1 \text{NP}_1 [&1 \text{ (to)} [&P_2 \text{NP}_2 [&2 \text{ (to)} \text{NP}_3]])]]

However, we will abstract away this complexity because it is irrelevant to our discussion here. See Munn (1987) and Johanssen (1998) for a relevant discussion.
Comparing the structures in (39a,b) and those in (43a,b), it is immediately clear that there are two more functional categories in (43a) and (43b), compared with (39a) and (39b), respectively, because nP is added on top of each TP, and that (43b) has one more functional category than (43a) because CP is added on top of TP. Hence, we predict that the progressive development of syntactic constructionalization goes as follows: (39a) > (39b) = (43a) > (43b). As far as we can see from corpus data, the actual course of historical development is more or less along these lines.

We have seen that in (31a,b) there are two independent course of developments: one is development from juxtaposition to coordination and the other is from a Genitive subject construction (TP) to a Nominative subject construction (CP) (cf. (11)). All in all, we have argued that these constructions have all developed from the smallest structure of dvandva compounds as in (37). And in deriving the coordinated structure from the juxtaposed structure, we need a syntactic nominalization of TP or CP, without realizing any overt nominalizing suffix. Since the (phrasal) nominalization in (43a,b) cannot take place in the lexicon, we are arguing for Don’s (2005) proposal about zero derivation.

Now, let us make a natural assumption that as far as the antonymous combinations are concerned, the younger age groups are more likely to have acquired a more complex structure than the older age groups, and that those who were exposed to the structure frequently in the course of language acquisition are more likely to judge the structure acceptable than those who were not exposed to it as a child. When the linear sequence of diachronic development in (39) to (43) is coupled with these assumptions, we predict the following:

(44) a. The juxtaposed structures will be more acceptable than the coordinated structures for all the age groups.

b. The Genitive subjects will be more acceptable than the Nominative ones for all the age groups.

c. The younger age groups are more acceptable for the coordinated structures than the older age groups.

5. Large-Scale Internet-based Surveys in Support of De-nominalization and Nominalization

To test the validity of the predictions we made in sections 3 and 4, we have administered three large-scale Internet-based surveys of acceptability judgments on each of the Nominative and Genitive subjects that occur in sentences like (1) to (3), each of which targeted for more
than four hundred participants whose ages range between 20s and 70s, and obtained a statistically significant result of intergenerational variation for each that will support the above-mentioned predictions. Among these, we will summarize two, and as for the first case, readers will be referred to Niikuni, Wada and Ogawa (2017) and Ogawa, Niikuni and Wada (2017, 2018a,b) for detailed discussion. As for the rests of the remaining two experiments, the former is about the de-nominalization of formal noun complement clauses, so that we predict that the younger age groups will be progressively less likely to be accept a Genitive subject in it, and the latter is about the nominalization of juxtaposition or coordination of non-nominal antonyms, so that we predict that the younger age groups will be progressively more likely to be accept a Genitive subject in it. We will show that both these predictions are borne out.

5.1. Experiment 1: Genitive Subject in the Complement of Formal Noun

5.1.1. Methods

Participants
Five hundred fifty-nine native speakers of Japanese participated in the Web-based survey, administered in the second half of 2018. All the participants met the following criteria: (i) born in the Tokyo metropolitan area (i.e., born in Tokyo, Saitama, Chiba, or Kanagawa Prefecture), (ii) raised in this area until the age of 15, and (iii) now living in this area. We finally analyzed the data from 400 participants, who correctly answered each of the dummy items described in the Procedure section. Table 9 shows the age categories and the numbers of participants for each category.

<table>
<thead>
<tr>
<th>Age (years old)</th>
<th>N</th>
<th>Average age (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–29</td>
<td>80</td>
<td>25.2 (2.8)</td>
</tr>
<tr>
<td>30–39</td>
<td>80</td>
<td>35.4 (3.0)</td>
</tr>
<tr>
<td>40–49</td>
<td>80</td>
<td>44.7 (2.6)</td>
</tr>
<tr>
<td>50–59</td>
<td>80</td>
<td>54.5 (2.9)</td>
</tr>
<tr>
<td>60–69</td>
<td>80</td>
<td>64.1 (2.8)</td>
</tr>
</tbody>
</table>

Materials
We created 16 sets of experimental sentences which can be assigned for the following 2 (Case: Nominative/Genitive) × 2 (Noun: formal/common) conditions, where hazu represents the formal noun and riyuu 'reason' represents the common noun, as the two types of constructions
hosting either of the nouns *hazu* and *riyuu*, that is, “*X-ni Y-ga/no iru {hazu/riyuu}-ga nai*,” have almost the same meaning:

(i) Nominative case/formal noun condition

Sono Kooen-ni Yuko-tati-ga iru-**hazu**-ga nai.
that park-at Yuko-PL-Nom be-probability-Nom Neg
‘There is no probability that Yuko and others are in that park.’

(ii) Nominative case/common noun condition

Sono Kooen-ni Yuko-tati-ga iru-**riyuu**-ga nai.
that park-at Yuko-PL-Nom be-reason-Nom Neg
‘There is no reason that Yuko and others are in that park.’

(iii) Genitive case/formal noun condition

Sono Kooen-ni Yuko-tati-no iru-**hazu**-ga nai.
that park-at Yuko-PL-Gen be-probability-Nom Neg
‘There is no probability that Yuko and others are in that park.’

(iv) Genitive case/common noun condition

Sono Kooen-ni Yuko-tati-no iru-**riyuu**-ga nai.
that park-at Yuko-PL-Gen be-reason-Nom Neg
‘There is no reason that Yuko and others are in that park.’

In addition to the 16 target sentences, we created 32 filler sentences. The target sentences were distributed over four experimental lists using a Latin square design with conditions counterbalanced across lists. The filler sentences were added to each list, and the order of the items were individually randomized.

5.1.2. Procedure

A total of 48 sentences (16 target and 32 filler items) were presented on a page on the Web browser, and participants performed an acceptability-rating task in which they rated each sentence on a 5-point Likert scale ranging from 0 (unacceptable) to 4 (acceptable). In addition, two dummy items were inserted at random positions in the array of sentences. For these items, participants were instructed to make the specified answer: rating “0” for one dummy item, while “4” for the other. If a participant made a different answer from what was specified at least once
for the dummy items, we excluded the participant’s data from the analysis.

5.1.3. Results

Taking the rating scores as dependent valuable, we conducted linear mixed-effects model analyses with participants and items as random factors. We included Case (Nominative/Genetive), Noun (formal/common) and participants’ Age (continuous variable) as fixed effects with interactions between the factors. We included random intercepts and slopes for the Case and Noun factors and the interaction between them. Case conditions and Noun conditions were deviation-coded, and the continuous variable (Age) was standardized. Table 10 shows the results of the statistical analysis.

Table 10. Results of the linear mixed-effects model analysis for rating scores (Experiment 1).

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>2.139</td>
<td>0.039</td>
<td>54.38</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Case</td>
<td>-1.011</td>
<td>0.053</td>
<td>-19.12</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Noun</td>
<td>0.006</td>
<td>0.038</td>
<td>0.16</td>
<td>.877</td>
</tr>
<tr>
<td>Age</td>
<td>0.004</td>
<td>0.038</td>
<td>0.10</td>
<td>.924</td>
</tr>
<tr>
<td>Case × Noun</td>
<td>0.986</td>
<td>0.062</td>
<td>15.88</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Case × Age</td>
<td>0.151</td>
<td>0.053</td>
<td>2.86</td>
<td>.004</td>
</tr>
<tr>
<td>Noun × Age</td>
<td>0.004</td>
<td>0.038</td>
<td>0.09</td>
<td>.926</td>
</tr>
<tr>
<td>Case × Noun × Age</td>
<td>-0.180</td>
<td>0.062</td>
<td>-2.90</td>
<td>.004</td>
</tr>
</tbody>
</table>

Figure 7. Mean rating scores for each experimental condition (Experiment 1). Error bars indicate standard errors of the mean by participant.
Figure 7 shows the mean rating scores for each experimental condition for all participants, and Figure 8 shows the rating scores predicted from the parameter estimates of the final regression model (the vertical axis indicates age of the participants). Inspection of Figure 7 suggests that while in the Nominative case condition, the mean rating score is lower in the formal noun condition than in the common noun condition, in the Genitive case condition, the score is lower in the common noun condition than in the formal noun condition. A significant Case × Noun interaction (see Table 6) supports this opposite direction of the effects of Noun factor for each case condition.

More importantly, the mixed model analysis revealed a significant Age × Case × Noun interaction, as shown in Table 10. As follow-up analyses of this three-way interaction, we examined simple main effects of Case and Age as well as simple interaction between them for each Noun condition, with re-coding the Noun factor either as (0, 1) or as (0, 1) (Aiken and West 1991). The analyses revealed that in the formal noun condition, the main effect of Case ($\beta = -1.50, SE = 0.07, t = -20.67, p < .001$) and the interaction between Case and Age ($\beta = 0.24, SE = 0.07, t = 3.32, p < .001$) were significant. The main effect of Age was not significant ($\beta < 0.01, SE = 0.04, t = 0.05, p > .1$). Since the Case × Age interaction was significant, we further examined the simple-simple main effects of Age for each Case condition. The analyses revealed that the main effect of Age was significant both in the Nominative ($\beta = -0.12, SE = 0.05, t = -2.48, p = .014$) and Genitive ($\beta = 0.12, SE = 0.06, t = 2.18, p = .030$) case conditions. The coefficients suggest that in the Nominative case (formal noun) condition, younger participants judged the sentences less acceptable. In contrast, younger participants judged the sentence more acceptable in the Genitive case (formal noun) condition.

On the other hand, in the common noun condition, the main effect of Case ($\beta = -0.52, SE = 0.05, t = -11.00, p < .001$) was significant but the analyses found no significant main effect of Age ($\beta = 0.01, SE = 0.05, t = 0.11, p > .1$) or significant interaction between Case and Age ($\beta = 0.06, SE = 0.05, t = 1.30, p > .1$).
Figure 8. Rating scores predicted from the parameter estimates of the mixed effects regression model (Experiment 1). Shaded areas indicate 95% confidential intervals.

5.2. Experiment 2: Juxtaposition or Coordination of Antonyms with a Genitive or Nominative Subjects

5.2.1. Methods

Participants
Five hundred sixty-seven native speakers of Japanese participated in the Web-based survey, administered in the first half of 2019. All the participants met the same criteria as the Experiment 1. We finally analyzed the data from 400 participants (Table 11), who correctly answered each of the dummy items.

<table>
<thead>
<tr>
<th>Age (years old)</th>
<th>N</th>
<th>Average age (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–29</td>
<td>80</td>
<td>25.7 (2.8)</td>
</tr>
<tr>
<td>30–39</td>
<td>80</td>
<td>34.8 (2.9)</td>
</tr>
<tr>
<td>40–49</td>
<td>80</td>
<td>44.7 (3.0)</td>
</tr>
<tr>
<td>50–59</td>
<td>80</td>
<td>54.1 (2.7)</td>
</tr>
<tr>
<td>60–69</td>
<td>80</td>
<td>63.8 (2.7)</td>
</tr>
</tbody>
</table>

5.2.2. Materials and Procedure
We created 16 sets of experimental sentences which can be assigned for the following 2 (Case: Nominative/Genitive) × 2 (Coordinator: absent/present) conditions:
(i) Nominative case/coordinator absent condition
heya-\textit{ga} akarui kurai de, sagyoo-no siyasusa-wa zenzen tigai-masu.
\textit{room-Nom bright dark} by operation-Gen easiness-Top totally differ-Hon.
‘Depending on whether the room is bright or dark, the easiness of the operation differ totally.’

(ii) Nominative case/coordinator present condition
heya-\textit{ga} akarui-\textit{to} kurai-\textit{to} de, sagyoo-no siyasusa-wa zenzen tigai-masu.
\textit{room-Nom bright-and dark-and by operation-Gen easiness-Top totally differ-Hon.}
‘Depending on whether the room is bright or dark, the easiness of the operation differ totally.’

(iii) Genitive case/coordinator absent condition
heya-\textit{no} akarui kurai de, sagyoo-no siyasusa-wa zenzen tigai-masu.
\textit{room-Gen bright dark} by operation-Gen easiness-Top totally differ-Hon.
‘Depending on whether the room is bright or dark, the easiness of the operation differ totally.’

(iv) Genitive case/coordinator present condition
heya-\textit{no} akarui-\textit{to} kurai-\textit{to} de, sagyoo-no siyasusa-wa zenzen tigai-masu.
\textit{room-Gen bright-and dark-and by operation-Gen easiness-Top totally differ-Hon.}
‘Depending on whether the room is bright or dark, the easiness of the operation differ totally.’

Thirty-two filler sentences were also prepared, and four experimental lists were created in the same manner as the Experiment 1. The experimental procedure was identical to the Experiment 1.

5.2.3. Results
We performed linear mixed-effects model analyses in the same manner as the Experiment 1. We included Case (Nominative/Genitive), Coordinator (absent/present) and participants’ Age (continuous variable) as fixed effects with interactions between the factors. Table 12 shows the results of the statistical analysis.
Table 12. Results of the linear mixed-effects model analysis for rating scores (Experiment 2).

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>2.564</td>
<td>0.056</td>
<td>46.12</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Case</td>
<td>0.054</td>
<td>0.021</td>
<td>2.52</td>
<td>.012</td>
</tr>
<tr>
<td>Coordinator</td>
<td>-0.116</td>
<td>0.029</td>
<td>-4.06</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Age</td>
<td>-0.048</td>
<td>0.045</td>
<td>-1.08</td>
<td>.280</td>
</tr>
<tr>
<td>Case × Coordinator</td>
<td>-0.120</td>
<td>0.044</td>
<td>-2.71</td>
<td>.007</td>
</tr>
<tr>
<td>Case × Age</td>
<td>-0.049</td>
<td>0.021</td>
<td>-2.32</td>
<td>.021</td>
</tr>
<tr>
<td>Coordinator × Age</td>
<td>-0.030</td>
<td>0.029</td>
<td>-1.06</td>
<td>.290</td>
</tr>
<tr>
<td>Case × Coordinator × Age</td>
<td>&lt; 0.001</td>
<td>0.044</td>
<td>-0.01</td>
<td>.994</td>
</tr>
</tbody>
</table>

Figure 9. Mean rating scores for each experimental condition (Experiment 2). Error bars indicate standard errors of the mean by participant.

Figure 9 shows the mean rating scores for each experimental condition for all participants. Since the interaction between Case and Coordinator was significant, we tested the simple main effects of Coordinator for each Case condition as well as the effects Case for each Coordinator condition. While in the Nominative case condition, there was no significant main effect of Coordinator ($\beta = -0.06, SE = 0.04, t = -1.58, p > .1$), in the Genitive case condition, we obtained a significant main effect of Coordinator ($\beta = -0.18, SE = 0.04, t = -4.78, p < .001$). The main effect of Case was also significant in the coordinator-absent condition ($\beta = 0.11, SE = 0.03, t = 3.60, p < .001$), but not significant in the coordinator-present condition ($\beta = -0.01, SE = 0.03, t = -0.21, p > .1$). These results indicate that sentences were judged more acceptable in the Genitive case/coordinator absent condition compared to the other three conditions.

In addition, since the interaction between Case and Age was also significant, we tested the
simple main effects of Age for each Case condition. The analyses demonstrated that there was no significant main effect of Age both in the Nominative case condition ($\beta = -0.02, SE = 0.05$, $t = -0.51, p > .1$) and in the Genitive case condition ($\beta = -0.07, SE = 0.05$, $t = -1.61, p > .1$), although the coefficients suggest that younger speakers tend to judge the sentences more acceptable in the Genitive case condition, and this tendency is slightly weaker in the Nominative case condition. Figure 10 shows the Case × Age interaction plot (vertical axis: the rating scores predicted from the parameter estimates of the final regression model, which is shown in Table 12).

Figure 10. Rating scores predicted from the parameter estimates of the mixed effects regression model (Experiment 2). Shaded areas indicate 95% confidential intervals.

6. Discussion

6.1. The More Speedy Decline of Formal Nouns Licensing Genitive Subjects than Common Nouns Licensing Genitive Subjects

The statistical analysis and its results obtained in section 5.1 shows (i) that a highly significant main effect of Case and inspection of Figure 7 (see also Figure 8) suggest that the sentences were judged less acceptable in the Genitive case condition than in the Nominative case condition, irrespective of the Noun condition, (ii) that the Case × Noun interaction is significant ($p = 0.007$), meaning that Nominative subject is more acceptable with the formal noun than with the common noun, whereas Genitive subject is less acceptable with the formal noun than with the common noun, (iii) that the Case × Age × Noun interaction is significant ($p = 0.004$), meaning that there is no intergenerational difference in the acceptability of Nominative and Genitive subjects with the common noun, but with the formal noun, the younger age groups are
more and more acceptable with Nominative subject, whereas less and less acceptable with Genitive subject.

We argued in section 2 that while Genitive subjects in Japanese are still grammatical in many syntactic environments, their frequency has been gradually decreasing in every construction and they are more and more likely to be replaced by the Nominative Case counterparts. Harada (1971) argued that the decline in the acceptability of Genitive subjects in certain constructions is due to the presence of two idiolects, which he called Dialects A and B, and those who were in their twenties at the time were Dialect A speakers. Based on Harada’s (1971, 1976) and Nambu (2007, 2014) works, Ogawa (2018) argues that the Dialects A and B are those grammar in which the GSCs are CPs and TPs, and that the increase in the number of Dialect B speakers among younger age groups is causing the progressive decrease in the frequency of the GSCs in every construction and the almost complete disappearance of the non-Adjacent Condition and the Nominal Copula Condition, as well as the co-occurrence of a Genitive subject with an overt complementizer. In fact, Ogawa (2018) argues that the syntactic size of the GSC is more and more shrinking to vP or VP/AP in the much younger age groups than those who Harada identified as Dialect B speakers.

If the Genitive subjects are narrowing the syntactic environments as a result of the diachronic change which we call “clause shrinking,” it is naturally expected that the frequency of the GSC in each construction is progressively decreasing and that the younger age groups are less and less likely to accept certain constructions that contain a Genitive subject. But the formal noun condition is less acceptable with Genitive subject than the common noun condition. This is exactly in accordance with the corpus data we saw in section 3, which shows that the frequency of the Genitive subjects in the complement of a formal noun have been more steeply declining than the frequency of the Genitive subjects in the relative clause and two figures reversed in the 1940-50s.

We can attribute the reason to the process of “de-nominalization” as a result of secondary grammaticalization that has applied to formal nouns but not to common nouns, and which can take place independently of the clause shrinking that is taking place in the last 100 years. Most of the formal nouns in Japanese are already grammaticalized from common nouns by grammaticalization, but in the last 100 years, some of them have been undergoing secondary grammaticalization toward modal or aspectual auxiliaries due to the emergence of new aspectual and modal constructions by means of them, as we saw in Table 6. When the formal nouns as a grammatical category is more and more undergoing secondary grammaticalization, both lexicalization and decategorization are progressively depriving the independent nominal status of the formal nouns, and the diachronic process can apply more rapidly for a formal noun.
that originally has a sense of modality. As a result, with the younger age groups, the analytic form *hazu-ga-nai* has been more and more replaced by the reduced form *hazu-nai*, and *hazu* is becoming less and less likely to accept a Genitive subject.

Both “clause shrinking” that apply for relative clauses and “de-nominalization via grammaticalization” that apply for formal nouns are crucial factors in decreasing the frequency of Genitive subjects in total. Since they progress independently from each other, the gradient of the latter can outgo that of the former. In fact, Figure 6 shows that the speed of formal nouns grammaticalizing into a modal auxiliary in the complementizer domain is much faster than that of clause shrinking that apply for relative clauses, and this is why the frequency of the GSCs as the complement of a formal noun became lower than that of the GSCs as relative clauses in the 1940-50s.

### 6.2. The Syntactic Constructionalization of Antonymic Dvandva

The statistical analysis and its results obtained in section 5.2 shows (i) that the Case × Coordinator interaction is significant (*p* = 0.007), meaning that in the juxtaposition, but not in the coordination, Genitive subject tends to be more acceptable than the Nominative subject, (ii) that the Case × Age interaction is significant (*p* = 0.021), meaning that Genitive Case tends to be more and more acceptable than Nominative Case for the younger age groups than for the older ones.

Given these results, let us first consider why the Genitive case & coordinator-absent condition is more acceptable than the other three conditions. This is because all the age groups can allow the structure in (39) and (40a), which contains less than 5 functional categories, but (40b), (43a) and (43b), which contain 7 or 9 functional categories, are unacceptable for the older age groups and are increasingly more acceptable only for the younger age groups, as a result of syntactic constructionalization taking place in the last few decades. As the total number of those who accept (40b), (43a) and (43b) is smaller than those who accept (39) and (40a), the latter becomes significantly more acceptable than the former.

Second, consider the Age effect: why Genitive Case tends to be more and more acceptable than Nominative Case for the younger age groups than for the older ones. We can interpret this as the non-increase of the acceptability of Nominative Case condition for the older age group. This is because it is more likely that the constructionalization has not yet proceed up to (40b) and (43b) for the older age groups, who were not less exposed to the Nominative Case conditions in their childhood.

Third, consider why the Coordinator × Age interaction is not significant. If the Coordinator
× Age interaction were significant, it would mean that the coordinator-absent condition is more acceptable than the coordinator-present condition for the older age groups, but not necessarily for the younger age group. Given what we have argued so far, this interaction might have to be significant, as the constrictions with an overt coordinator should have as many as 7 or 9 functional heads, while those without one should have as many as 5 functional heads, and hence the phonetically empty nominalizer is more likely to be available for the younger age groups than for the older ones. However, the fact that the Coordinator × Age interaction is not significant does not mean that there is NO intergenerational difference in the acceptability of the coordinator-present condition between the younger and the older age groups; there may be another relevant factor that could blur the Age effect. More specifically, we can explain this divergence as follows: under our assumptions, the overt coordinator to is available only when each conjunct is nominal. Hence, one might suppose that structures (43a) and (43b) are allowed as far as the phonetically empty nominalizer that nominalizes each verbal or adjectival conjunct is available. However, there is an alternative way to express the same meaning as (4a,b) by means of an overt nominal complementizer (Cn) no, and this is only possible with the overt coordinator, as shown by the contrast between (45a) and (45b):

\[(45) \quad \text{a. Taro-} \text{nog} \text{a iruv no to inaiA no-to-de/niyotte, ...} \]
\[
\text{Taro-Nom/Gen is Cn Conj is-not Nz-Conj-with/depending.on} \\
\text{‘Depending on whether Taro is here or not, ...} \\
\text{b.*Taro-} \text{nog} \text{a iruv no inaiA no-de/niyotte, ...} \\
\text{Taro-Nom/Gen is Cn is-not Nz-with/depending.on}
\]

(45a) is arguably not a result of syntactic constructionalization from the antonymous compounds but can be independently generated by the frequently available mechanism of clause nominalization in Japanese. Hence, if there is an option of generating (31a,c,e) by eliminating the phoneme of the overt nominal complementizer no from (45a) available for the older age groups, independently of syntactic constructionalization from (4b), then even the older age group can judge (4a) as acceptable as (4b) as a variant of (45a). In fact, as shown in Figure 3, the period between the late Edo Era and the Taisho Era was when the overt nominal complementizer (Cn) no, as in (46a), was developing and going to replace the adnominal inflection on C, as in (46b), and its phonetically empty counterpart, as in (46c), but the three types of complementizer were simultaneously used in the same syntactic environment.\[11\]

\[11\text{Incidentally, we assume that the Genitive subjects in (46b-c) are licensed for the same reasons, whatever}\]
(46) a. いづれも其日の来るのを待ちかねた様子、 (「太陽」, c.1895)
irezure-mo sono hi-no kuru-no-o mati-kaneta yoo-su
everyone that day-Gen come-CN-Acc wait-impatiently look
‘everyone seems to be waiting for the day to come impatiently’

b. 吾人は唯だ其成功の顯はるるを俟つ者なり、
gojin-wa tada sono seikou-arawaru-ru-o matu mono nari, ...
we-Top just that success-Gen emerge-CADN-Acc wait man Cop
‘We are just waiting for the success to be visible.’
(「国民之友」, c.1888)

c. 横見の言葉の終るを待ちていと長々しく息を吹きつ
Yokomi-no kotoba-no owaru-φ-o mati-te ito naganagasiku
Yokomi-Gen word-Gen finish-Comp-Acc wait-and very long
iki-o fuki-tu
breath-Acc blow-Perfect (「太陽」, c.1901)
‘(I) waited for Yokomi’s words to finish and blew out my breath deeply, …’

The grammar of the Japanese of about 100 years ago is different from that of the present-day Japanese, in which both (46b) and (46c) are totally ill-formed; the modern Japanese counterparts both require an overt complementizer no in the relevant positions, as in (46a).

From these considerations, it seems highly probable that those who are now in their 60s or older could have acquired a mixed grammar in which the empty nominal complementizer (φ Cn) was as acceptable as the overt counterpart no (and as a result, the native speakers at the time were in the state of diglossia). Given these facts, our idea is to propose that (31a,c,e) are grammatical for the older age groups and for the younger ones for different reasons: on one hand, they are grammatical for the younger age groups as the coordination of antonyms has been gradually undergoing syntactic constructionalization, as in (43a,b). On the other hand, they are grammatical for the oldest age groups because the null counterpart of nominal complementizer (Cn) no is optionally available in the coordination of antonyms too, as in (47); this structure is permitted for those who accept (46c), for reasons independent from the syntactic constructionalization that are taking place in coordination of antonyms, because it does not involve phrasal nominalization but a nominal complementizer:

they are, as that in (16) in the classical Japanese. See Hiraiwa (2002, 2005) and Ogawa (2018, 2019a) for a discussion.
Due to the mixture of the two independently ongoing syntactic processes, there happens to be no intergenerational difference in the acceptability of (31a,c,e). Whether this solution is valid or not needs a deeper investigation of the syntax of phrasal nominalization, that will take us far afield from the main concern of this article, hence, we will leave the issue for future research.12

Among all the results we obtained, it is most important to note that in Japanese there are clausal complements in which Genitive subjects are more acceptable than Nominative ones. This means that while the GSCs are progressively being replaced by the Nominative Subject Clauses (NSCs) in most of the embedded clauses in Japanese, it is not the case that Genitive subjects are going to be eliminated completely. We argued that Japanese allows phrasal nominalization as zero derivation and in such an environment, and the Nominative/Genitive Conversion will persist at least in this environment. The result also implicates that, as Don (2005) and Kishimoto (2006) argue about different constructions, the Universal Grammar will allow nominalization at the level of phrases and zero affix that plays an important role there. From a still larger perspective, this possibility also forces us to admit that nominalization should be a syntactic process rather than a lexical one, as Chomsky (1970) argues, and the results in this section support the hypothesis of syntactic nominalization, as also defended in Valois (1991), Lieber (1992), Marantz (1997), Ogawa (2001), Borer (2005, 2012), and Bruening (2018), among many other recent proponents of distributed morphology.

7. Conclusion

In this article, we have argued for the following three points: first, the Genitive subject constructions in Japanese or the Nominative/Genitive Conversion (NGC) provides crucial evidence for the syntactic nature of nominalization and de-nominalization: it argues for

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12 We will also have to leave it for future research why (45b) is ill-formed.
syntactic nominalization because a phonetically null nominalizer that takes a TP or CP is necessary to account for the nominal nature of the phrase in which adjectives or verbs are either coordinated or juxtaposed; it argues for a syntactic de-nominalization because secondary grammaticalization of formal nouns needs to be posited in order to account for the diachronic decline of Genitive subjects in the complement of formal nouns, which are ongoing in a more steep way than the decline of Genitive subjects in the domain of common nouns, or in relative clauses. Second, we argued that the diachronically changing facts about a mixed category which shows both verbal and nominal characteristics can provide crucial evidence for the otherwise unsolvable controversial issues about nominalization. Third, we argued that what we can see from historical corpora is shown to be more or less in tandem with our introspective judgments, if we take hundreds of native speakers whose ages are different and ask them to judge the acceptability of the sentences in which diachronic change is now in progress: a construction whose frequency is declining tends to be judged in such a way that the younger age groups are likely to judge it less acceptable, whereas a construction whose frequency is increasing tends to be judged in such a way that the younger age groups are likely to judge it more acceptable.

As far as we know, no comparable experiment has ever been made about the syntactic change, but the presence or absence of the relation between frequency change and language change has been a long-standing issue in diachronic syntax: some syntacticians have simply assumed that syntactic change will not occur unless there is language contact (Kroch (2001)), whereas others argue that change in the frequency of the target constructions does have any direct relevance to a change in the value of certain syntactic parameter (Lightfoot (1991, 1999)). In this article, as well as in Niikuni et al. (2017) and Ogawa, et al. (2018a,b), we have intentionally avoided making a direct connection between frequency change and change in the degree of acceptability of certain syntactic constructions and instead claimed that change in the frequency of certain syntactic constructions triggered microparametric change in syntactic structure, which in turn has influence on the change in the acceptability of the constructions by different age groups. However, Bader and Häussler (2010) show that at least for certain syntactic constructions in German that they discuss, there is a strong correlation between their acceptability judgments among native speakers and their frequency, and that there is also a strong correspondence between the binary grammaticality judgment (i.e. whether ‘grammatical’ or ‘ungrammatical’) and the gradient acceptability ratings (in terms of Magnitude Estimation; Bard, Robertson and Sorace (1996); but the same would also apply to the 5-point Likert scale). At the same time, Bader and Häussler (2010: 316) are careful enough to say that “not all distinctions in perceived well-formedness were reflected in the corpus counts, nor did all corpus
distinctions lead to related differences in perceived well-formedness.” More specifically, they have found two patterns of mismatch between their experiments and corpus counts, as in (48):

(48) a. Ceiling Mismatch:
When perceived well-formedness is at the ceiling, two syntactic structures may differ in terms of frequency despite being perceived as equally well-formed.

b. Floor Mismatch:
If frequency is at floor, two syntactic structures may differ in terms of perceived well-formedness despite both occurring with zero or near-zero frequency.

Given (48b) and the considerably low frequencies of the syntactic constructions we have dealt with in this article, the reason why no statistically significant intergenerational difference in acceptability emerged with certain constructions might also be reduced to the floor effect. In any way, however, our study in this article may validate Bader and Häussler’s (2010) conclusion from the perspective of diachronic syntax in that most, if not all, constructions are more and more (or less and less) acceptable in proportion to the frequency of the relevant data each age groups are exposed to. In fact, if the issue can be pursued with a more exact assumption about the correspondence between the age brackets of the participants and the mutually differing syntactic size of the relevant constructions for them, we could identify where the ceiling and the floor are in (48a,b) respectively for fixing each parametric value as they are, and this will make a contribution to a better understanding of the relation between language acquisition and language change and possibly to the resolution of the Logical Problem of Language Acquisition, as originally pointed out by Clark and Roberts (1993). Anyway, we believe that it would be a better approach to diachronic parametric syntax if we could get any evidence relevant to parametric syntax from acceptability judgments by those who are alive and belong to different age groups, get a statistically significant Age effect, and demonstrate that syntactic change is now in progress, than simply discussing the same issue from the data from already extinct languages.

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