On the History of CAN and MAY

—— Mechanisms of Semantic Change ——

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0. Introduction

It is well known that English modals CAN and MAY have changed their meanings in the history of English from 'to know (how to)' to 'to be able to' and from 'to be able to' to 'to be allowed to', 'to be possible', respectively. (Cf. Ono 1969: 156, Visser 1963–73: §1622, and many other handbooks on English history and Germanic languages) Few of the recent studies on the semantics of English modals including CAN and MAY (cf. Palmer 1979, Coates 1980, Perkins 1982, etc.), however, postulate the following questions as their primary issue:

(1) Why have CAN and MAY suffered such semantic changes? and What kind of linguistic mechanisms are concerned with such semantic changes?

The aim of this paper is to approach this simple but most significant problem.

In Section 1 we will briefly observe the historical semantic properties of CAN and MAY. Section 2 examines those few recent arguments which are concerned with the problem. In Section 3 we will elaborate our own view on this problem, and show how two kinds of linguisthic mechanisms underlie the semantic changes of CAN and MAY.

1. History of CAN and MAY

1-1. Early Forms of CAN and MAY

CAN (< OE *cunnan*) and MAY (< OE *magan*) are from common Germanic preterite-present verbs, and their earliest known meanings are 'to know, know how to, be mentally or intellectually able to' and 'to be strong or able, to have power', respectively. (Cf. OED, etc.) It can be seen here that CAN and MAY in the PE usage have lost their meanings 'to know (how to)' and 'to be strong, to have power'. Below is a list of those correspondenes to CAN and MAY in the main present-day Germanic languages:

(2) English   can   may
     German   können   mögen
     Dutch   kunnen   mogen

Danish	kunne	måtte
Norwegian	kunne	måtte
Swedish	kunna	måtte

Note that KNOW (<OE *(ge) cnawan*) is cognate with CAN. It should also be noticed that each present-day Germanic language has a verb that signifies 'to know' and that is cognate with what corresponds to CAN (cf. (2) above):

(3)	English	can	know	(ken)
	German	können	(OHG -cnaan)	kennen
	Dutch	kunnen	....	kennen
	Norwegian	kunne	....	kjenne
	Danish	kunne	....	kende
	Swedish	kunna	....	kännan

1-2. CAN and MAY in the History of English

In OE *cunnan* (CAN) signifies 'to know' when used as a main verb in a sentence, and conveys the sense 'to know how to', hence, a sense of mental or intellectual ability, 'to be mentally or intellectually able to' when followed by an infinitive. *Magan* (MAY) on the other hand signifies 'to be strong or healthy' as a main verb, and in an auxiliary use it expresses various modal meanings, such as (inherent) ability 'to be able to', possibility 'to be possible' and permission 'to be allowed to'. (Cf. ASD, etc.) Let us illustrate these uses of OE *cunnan* and *magan* by citing relevant examples from *Beowulf* (cf. Ono 1969: Chap. IV, Sec. 3–4):

(4)   *cunnan* as a main verb: 'to know'

   a . 372   Ic hine *cuþe* cnihtwesende;

          'I knew him when he was a youth'

   b . 162   men ne *cunnon*, hwyder helrunan hwyrftum scriþað.

          'men know not where such mysterious creatures of hell go in their wanderings'

(5)   *cunnan* followed by an infinitive: 'to know how to', hence, 'be mentally or intellectually able to'

   a . 50   Men ne *cunnon secgan* to soðe,

          'men do not know how to say truly'

   b . 1746   him *bebeorgan* ne *con*

          'He does not know how to defend himself'

(6)[1]   *magan* as a main verb: 'to be strong, to have power'

   680   þeah ic eal *mæge*

          'though I have power'

(7) *magan* followed by an infinitive: 'to be able to'

    a . 277   Ic þæs Hroðgar *mæg* þurh rumne sefan ræd *gelæran,*

             'I can give Hrothgar good counsel about this'

    b . 478   God eaþe *mæg* þone dolsceaðan dæda *getwæfan!*

             'God can easily restrain the wild ravager from his deeds'

(8) *magan* followed by an infinitive: 'to be possible'

    a . 1365   Þær *mæg* nihta gehwæm niðwundor *seon,* fyr on flode.

             'There may be seen each night a fearful wonder, fire on the flood'

    b . 1378   Eard git ne const, frecne stowe, ðær þu *findan miht* sinnigne secg;

             'Thou knowest not yet the perilous place, where thou mayest find the sin-stained

             being.'

(9) *magan* followed by an infinitive: 'be permitted to'

    a . 2801   ne *mæg* ic her leng *wesan*

             'I may stay here no longer'

    b . 2864   Þæt, la, *mæg secgan* se ðe wyle soð specan,

             'Lo! this can he say who wills to speak the truth'

By the PE period both CAN and MAY have lost the main-verb usage exhibited in (4) and (6)[2]. In PE it is not CAN, but KNOW that is used in the sentence like (4). Another important change observed concerning the history of CAN and MAY is that MAY has yielded to CAN the signification 'to be (generally) abls to' (viz., the usage exhibited in (7)). These changes, which involve KNOW, CAN and MAY, can be seen by comparing the historical thanslations of the Bible:

(10)[3] Matthew. 11. 27.

    a . *Anglo-Saxon* (c. 995)

       nan man ne *can* ðone sunu, butun fædyr

    b . Wycliff (c. 1389)

       no man *knewe* the sone, no but the fadir

    c . Tyndale (1526)

       no man *knoweth* the sonne, but the father

    d . *Authorized Version* (1611)

       no man *knoweth* the sonne, but the father

    e . *Revised Version* (1881)

       no one *knoweth* the son, save the Father

    f . *Revised Standard Version* (1946)

       no one *knows* the Son except the Father

(11)[4] John 10—21

a . A. S.

Cwyst ðu *mæg* wod man blindra manna eagan ontynan?

b . W.

Wher a deuel *may* opene the yȝen of blinde men?

c . T.

Can the devyll open the eyes off the blynde?

d . A. V.

Can a devil open the eyes of the blind?

e . R. V.

Can a devil open the eyes of the blind?

f . R. S. V.

Can a demon open the eyes of the blind?

2.　Critiques of Prior Analyses

2-1.　Nakano (1984)

Nakano (1984) is an investigation which makes most explicit argument towards our concern in this paper, viz. the problem of the semantic changes of CAN and MAY. In this regard, however, it is liable to an empirical falsification. In this section we will see how the argument in Nakano (1984) is constructed and on what grounds it is immune to the solution of our problem.

It is assumed in Nakano (1984: 24) that the semantic changes of English modals including CAN and MAY can be characterized as shift of the semantic field from Stage 1 to Stage 2, represented as (12) below:

(12)

	'know'	'be able to'	'be permitted'	'be compelled'	......
Stage 1	CAN	MAY	MUST	SHALL	......
Stage 2		CAN	MAY	MUST	......

Stage 2 above is assumed to have been completely established by the EModE period[5]. The following approach by Bloomfield (1933: 430) towards the semantic drift among the English nouns *food, meat* and *flesh* (cf. (13) below) is adduced as an independently motivated case for employing the mechanism of a shift in the semantic field *(loc. cit.)* :

When we find a form used at one time in a meaning A and at a later time in a meaning B, what we see is evidently the result of at least two shifts, namely, an expansion of the form from use in situations of type A to use in situatiion of a wider type A—B, and then a partial obsolescence by which the form ceases to be used in situations which approximate the old type A, so that finally the form is used only in situations of type B. In ordinary cases, the first process involves the obsolescence or restriction of some rival form that gets crowded out of use in B—situations, and the second process involves the encroachment of some rival form into the A—situations. We can

symbolize this diagrammatically as follows:

(13)

meaning:	'nourishment'	'edible thing'	'edible part of animal body'	'muscular part of animal body'
first stage:	*food*	*meat*	*flesh*	*flesh*
second stage:	*food*	*meat* →	*meat*	*flesh*
third stage:	*food* →	*food*	*meat*	*flesh*

As suggested in Bloomfield's statement cited above, there is usually an intermediate stage in the process of a semantic shift from one stage to the other. This point is taken account of in Nakano's approach, which posits the following additional diagram concerning the type of semantic changes at isue (ibid. 25) :

(14)

	M_1	M_2	M_3	M_4	......
Stage 1	A	B	C	D	......
Intermediate Stage		A B	B C	C D	......
Stage 2		A	B	C	......

— where M_1, M_2, ... stand for various meanings, and A, B, C, D, ... respresent distinct items.

It can be noticed that in the intermediate stage in (14) B and C have two distinct meanings; viz., M_2 and M_3 for B, M_3 and M_4 for C. Now it is evident that the semantic changes of English modals depicted as (12) have an intermediate stage, if, for instance, the usages of CAN and MAY in the ME period are examined, since CAN has at least two distinct meanings 'to know' and 'can, to be able to'[6], and MAY, likewise, 'can, to be able to' and 'may, to be permitted to'. The following are citations from *Canterbury Tales* (cf. Ono 1969, Chap. IV, Sec. 6) :

(15) CAN signifying 'to know'
      I *kan* a noble tale for the nones,   I 3126
      'I know a noble tale for the nonce'

(16) CAN signifying 'can, to be able to'
      I *kan* nat love a coward, by my feith!   VII 2911
      'I can not love a coward, by my faith'

(17) MAY signifying 'can, to be able to'
      Unnethe upon hir feet she *myghte* stonde.   II 1050
      'Hardly could she stand upon her feet'

(18) MAY signifying 'may, to be permitted'

May I nat axe a libel, sire somonour ...?   III   1595
'May I not ask a written copy of the charge, Sir summoner?'

Schematically, it is predicted thet after such an intermediate stage, Stage 2 will be completed. How, however, can Stage 2 concerning the semantic changes of the modals actually establish itself out of the preceding intermediate stage? It is this question thet is raised in Nakano (1984) as the central issue.

According to Nakano (1984: 26), two conditions are required for completing the Stage 2 in (14): i) There must be an intermediate stage. ii) The relevant items (A, B, C, ... in (14)) must constitute some sort of semantic field, viz. a closed class. The first condition is evidently satisfied in this case (cf. (15) ~(18) above). Concerning the second condition, it is alleged that English modals in the EModE period satisfy such a condition. It is argued, on the basis of the arguments by Lightfoot (1979: Chap. 2) and Steel et al. (1981: Appendix B), that the syntactic category of CAN, MAY, etc., originally Verb (V), was re-analyzed into Auxiliary (Aux) in the EModE period; thus re-analyzed as Aux in the EModE period, CAN and MAY with other modals constitute a closed class, whereas if they had remained V, they would have continued to constitute a part of the open class (viz., a part of the set of infinite V's). The semantic field comprised by the EModE modal auxiliaries is, accordinly, described as a strong field which is closed both semantically (since such modal auxiliaries cover a finite number of modal meanings) and syntacticlly (since they are Aux's, a finte set).

The argument restated above must now be examined as to wheter it suffices to settle problem (1).

What is argued in Nakano (1984) is how and why a shift from Intermediate Stage to Stage 2 in (14) occurred in the EModE period with English modals. No investigation is made as to how and why English modals suffered a shift from Stage 1 to the Intemediate Stage in (14). This point is of crucial importance when we investigate the problem of the semantic changes of CAN and MAY.

The change in the syntactic category of English modals, called Aux-Reanalysis in Lighfoot (1979), etc., is assumed, in Nakano (1984),to be a causative factor completing the semantic changes of CAN, MAY, etc. This will be empirically falsified if we analyze the corresponding facts, for instance, in German.

Details aside, one of the diacritic features by which we can discern Aux from V in the sense of Lightfoot (1979) is that Aux never has infinitive or past participle forms; i. e. Aux never appears as an infinitive after *to* or another Aux, nor in the perfective aspect. In this regard, by the folloowing examples let us illustrate that PE CAN is not V but Aux:

(19)   a . I expect him *to *can / be able to* teach English.

   b . You *will *can / be able to* leave the hospital soon.

   c . Haydn was the first composer to write a full sonata-form symphony but before him C. P. E. Bach *had* probably **could / been able to*.

As opposed to English modals, German modals have never suffered such Aux-Reanalysis. German

modals can still be used in the infinitive and participle forms:

(20) German KÖNNEN

    a . Ich bedauere, Ihre Einladung nicht annehmen *zu können.*

       'I am sorry that I cannot accept your invitation.'

    b . Ich *werde* nicht schlafen *können.*

       'I will not be able to sleep.'

    c . Ich *habe* ihn nicht retten *können.*

       'I could not rescue him.'

(21) German MÖGEN

    Ich *habe* nie gern tanzen *mögen.*

    'I have never liked to dance.'

(22) German MÜSSEN

    a . Ich *werde* einige Monate liegen *müssen.*

       'I will have to lie in bed for months.

    b . Er *hat* den ganzen Tag arbeiten *müssen.*

       'He had to work all day.'

The instances in (20) are those where KÖNNEN is used as *zu-* infinitive, bare infinitve and past participle. In (21) MÖGEN appears in past participle form. In (22) MÜSSEN is infinitive or past participle.

    From the fact that German modals, as to their syntactic category, are not reanalyzed into Aux's but remain V's (in other words, they do not constitute a closed field on syntactic grounds), Nakano's theory would predict that German modals have not completed the semantic changes. German KÖNNEN, however, has changed its signification from 'to know (how to)' to 'to be able to' in the history of German, just as English CAN has in the history of English. MÖGEN and MÜSSEN have also lost their older meanings 'to be able to' and 'to be permitted to', respectively, in present-day German usage:

(23) a . *Kennen / *Können* Sie ihn?

       'Do you know him / what he is?'

    b . Er *kann / *mag* Deutsch (sprechen).

       'He can speak German.'

    c . *Darf / *Muß* ich rauchen?

       'May I smoke?'

    From the viewpoint of the the above arguments, it seems safe to say that neither the shift from Stage 1 to Intermediate Stage nor that from Intermediate Stage to Stage 2 in (14) is adequately

approached in Nakano (1984); hence, the problem postulated in (1) remains unsolved.

2-2. Aijmer (1986)

Aijmer (1986) presents an approach to the principles of semantic changes on the basis of the corpus of Early Modern British English uses of CAN and MAY. Briefly, the view on the semantic changes here is that "New meanings come about through changes in the syntactic structure and conversational background." (ibid. 167) In this section this seemingly approriate view will be carefully examined, and it will be shown on what grounds it does not suffice to give a solution to our problem.

It is assumed in Aijmer (1986: 146)that the prototypical meaning of CAN is Ability on the grounds that "the category Ability is diachronically prior to Possibility" and that "Ability best corresponds to people's ideas of what CAN typically means." The following subset of factors to form a prototypical context involing Ability is, then, postulated *(loc. cit.)* :

(24) a . the subject is human and agentive

　　　b . the subject is specific

　　　c . the verbal action is possible in view of inherent properties of the subject ('inherent ability')

　　　d . the verbal action denotes a physical or psychological activity (a dynamic process which is in principle controllable by the subject / agent)

It is the following pieces of material from the corpus, which seem to obey every conditon in (24) above, that are cited to illsutrate the alleged protypical uses of CAN *(loc. cit.)* :

(25) a . and though *she can't act* them over again, she'll have the vanity to make you see she wants not the desire (1694)

　　　b . If we do not reckon the life of man to begin till *he* is in possession of himself and *can exercise* the faculties and powers peculiar to his species (1716)

Obviously, there are various meanings, other than Ability, that are expressed by CAN. Those meanings are assumed to develop from the prototypical meaning as some or all of the factors in (24) weaken or suffer alterations. This is the central point of Aijmer's argument. Apart from the exemplifications of those just minutely different from the prototypical usage, the illustration of how the meanings of Possibility and Permission develop suffices for the present purpose. One of the typical contexts of CAN conveying the sense of Possibility is as follows:

(26) all the advantages that *can be gained* by a criminal compliance (1686)

In the above instance the subject is neither human nor agentive (cf. (24a, b)) and the main verb phrase does not denote an action since it is in passive voice (cf. (24c, d)). According to Aijmer's interpretation, in such a sentence "the (human) subject is dissociated from the verb by the passive transformation". CAN embedded in a passive sentence with an inanimate subject like (26) is understood as a bridging

case from Ability to Possibility. (ibid. 149) Aijmer takes it for granted that different conversational backgrounds cause them. In the following sentence the circumstances denoted by the *because*-clause provide the conversational background, and CAN expressing Possibility can be paraphrased as 'something is (not) feasible':

(27) It is objected by many, that such a tax neither *can* nor ought in justice to be laid, because exemption from taxes was one of the conditions by which men were invited to lend their money on the security of these funds. (1702)

The conversational backgrounds of the the following instances are assumed to be the law (in (28)) and the speaker's conscience (in (29)), and CAN in each example is interpreted as expressing Permission:

(28) he is only subject to the laws, and not to the will of his master who *can* neither take away life, multilate, torture (1698).

(29) I *can*not pass by his vanity in saying, that those who have called Virgil, Terence and Tasso, plagiaries ...... had yet (1691)

The arguments restated above are plausible. However, do they adequately approach the problem stated in (1)? Has CAN been, throughout the history of English, a modal which can develop various meanings from its prototypical meaning, Ability? OE does accomodate a grammatical formation of passive sentences[7], and, needless to say, when an utterance is made, it always has some conversational background in OE as well as in any other human language. Nevertheless, there is no known use of OE *cunnan* in a passive sentence with an inanimate subject like (26)[8], nor that expressing Permission (cf. ASD, OED). For the sake of clarity, let us express this in another way. Although OE *cunnan* usually corresponds to Latin *scire* 'to know (how to)', 'to be mentally able to' (cf. Ono 1969: 161), as exemplified in (30) below, their behavior as to semantic developments differs crucially: While English CAN comes to be used in the passive voice as in (26), in the fifteenth century (cf. Visser 1963–73: §1656)[8], and also to express the sense of Permission, French *savoir* (< Latin *scire*) has never been used in the passisive voice with an inanimate subject, nor to express the sense of Permission (cf. (31) and (32)):

(30) *Colloquy* 62
      Ne *canst* þu huntian mid nettum?
      Gea, butan nettum huntian ic *mæg*.
      Ne*scis* uenare nisi cum retibus?
      Etiam sine retibus uenare *possum*.
      'Do you not know how to hunt except with nets?'
      Yes, I can hunt without nets.'

(31) Ce livre *sait* / *peut* être lu facilement.

'This book can be read easily'

(32) Tout le monde est là, vous *savez* / *pouvez* servir maintenant.

'Everybody has come, and you can / may serve now.'

Latin *sicre* and French *savoir* express a sense of Ability. Why did they never develop the senses of Possibility or Permission? This paradox will never be settled by means of the postulation that changes in syntactic struture and converational background cause semantic developments from the prototypical meaning. There seems to be a crucial change in nature with English CAN, but not with Latin *scire* (> French *savoir*), which Aijmer (1986) as well as Nakano (1984) fails to notice. In the following section we will pursue this point.

3. A New Explanation

3-1. Basic Facts

Before exercising our own theoretial investigation, let us observe the basic facts which seem to be most important when we approach the problem.

As we have seen in Section 1, the main present-day Germanic languages preserve pairs etymologically corresponding to English CAN and MAY (cf. (2)). Interestingly, all of the correspondences to MAY have lost their older meaning 'be able to', and have given way to the words corresponding to CAN[9]. To illustate this, compare the following passage in the Bible with (11):

(33) John 10—21

   a. German

     kann denn ein böser Geist die Augen der Blinden auftun?

   b. Dutch

     een boze geest *kan* toch de ogen van blinden niet openen?

   c. Danish

     kan en ond ånd åbne blindes ϕjne?

   d. Norwegian

     En ond ånd *kan* da ikke åpne ϕynene på blinde!

   e. Swedish

     kan en demon öppna ögonen på blinda?

As to CAN and its couterparts in present-day Germanic languages, they have lost the meaning expressing a bare knowledge or recognition with no implication of ability. Such a meaning has come to be conveyed by cognate verbs: KNOW (English), KENNEN (German and Dutch), etc. (Cf. (3).)[10] Now compare the following passage with (10):

(34) Matthew 11—27

a . German

und niemand *kennt* den Sohn als nur der Vater;

b . Dutch

en niemand *kent* de Zoon dan de Vader,

c . Danish

og ingen *kender* Sønnen uden Fadere,

d . Norwegian

Ingen *kjenner* Sønnen uten Faderen;

e . Swedish

Och ingen *känner* Sonen, utom Fadern,

Now we may say that it is characteristic not only of English but also of other Germanic languages that MAY (or its counterpart) has lost its older meaning expressing (general) ability to CAN (or its couterpart) and that CAN (or its correspondence) has changed its meaning from 'to know (how to)' to 'to be (generally) able to'. In contrast to this Germanic character, none of the Romance languages has undergone semantic changes concerning the couterparts of CAN and MAY. We may take Latin *scire* and *posse* as the semantic counterparts of CAN and MAY in their early forms, respectively (cf. (30)). In present-day Romance languages such as French, Italian, Spanish and Portuguese, the offsprings of Latin *scire* and *posse* still hold fast to their time-honored significations, 'to know (how to)' and 'to be (generally) able to', respectively. See, for instance, the following passages in the Bible:

(35) Jeremah 1—6

a . Vulgata

a a a Domine Deus ecce ne*scio loqui* quia puer ego sum

b . French

Ah! Seigneur Dieu, je ne *saurais parler,* je suis trop jeune.

c . Italian

Ah! Signore Dio! Ecco: non *so parlare* perché sono ragazzo!

d . Spanish

¡Ah, Señor Yavé, mira que yo no *sé hablar:* Soy un niño!

e . Portuguese

Ah! Senhor JEOVÁ! Eis que não *sei falar;* porque sou uma criança.

'Ah, Lord God! Behold, I do not *know how to* speak, for I am only a youth.' *(Revised Standard Version)*

(36) Genesis 20—6

a . Vulgata

et ego *scio* quod simplici corde feceris

b . French

Moi aussi, je *sais* que tu as agi avec un cœur intègre,

c . Italian

Anch'io *so* che con la semplicità del tuo cuore hai fatto

d. Spanish

Sí *sé* que has obrado con sencillez de corazón;

e. Portuguese

Bem *sei* eu que na sinceridade do teu coração fizeste isto;

'Yes, I *know* that you have done this in the integrity of your heart' *(R. S. V.)*

(37) John 10–21

a. Vulgata

Numquid daemonium *potest* caecorum oculos *aperire*

b. French

un démon *pourrait*-il *ouvrir* les yeux d'un aveugle?

c. Italian

Un demonio *può* forse *aprire* gli occhi ai ciechi?

d. Spanish

¿*Puede* acaso un endemoniade *abrir* los ojos a los ciegos?

e. Portuguese

pode, porventura, um demónio *abrir* os olhos aos cegos?

(cf. (11))

In (35) Latin *scire* and its descendants in present-day Romance languages, followed by an infiniteve, express the sense of mental / intellectual ability, 'to know how to, be mentally / intellectually able to'. In (36) they signify 'to know'. In (37) also, there is no difference between Latin *posse* and its Romance descendants in that they all convey the sense of (general) ability, 'to be able to'.

In addition to the above mentioned phenomena, there is another interesting set of facts involving Germanic and Romance counterparts of CAN and MAY: The Germanic counteparts of CAN (viz. PE *can,* German *können,* Dutch *kunnen,* Danish *kunne,* Norwegian *kunne* and Swedish *kunna,* all of which once signified the sense 'to know (how to), to be mentall / intellectually able to' but have lost that sense and come to signify as its primary meaning 'to be able to') and the Romance offsprings of Latin *posse* (viz. French *pouvoir,* Italian *potere,* Sapnish *poder* and Portuguese *poder,* which have been the modals to signify 'to be able to' throughout their history) have significations expressing Possibility, Permission, etc. besides their primary meanings expressing (general) Ability. However, the Romance versions of Latin *scire* (viz. French *savoir,* Italian *sapere,* spanish *saber* and Portuguese *saber,* all of which have kept the signification 'to know (how to), to be mentally / intellectually able to') never express the sense of Possibility or Permisson, but only signify the sense of knowledge and some kind of Ability. Let us illustrate these points by examining the uses of German *können,* French *savir* and *pouvoir:*

(38) German *können*

a. 'to be able to' (general ability)

Er *kann* auf dem Rücken schwimmen.

'He can swim on his back'

b. 'to be possible' (possibility)

Er *kann* jeden Tag sterben.

'He may die at any moment.'

c. 'to be allowed' (permission)

Du *kannst* gehen.

'You can / may go.'

(39) French *savoir* and *pouvoir*

a. *savoir:* 'to know how to, be mentally / intellecually able to' (mental / intellectual ability)

Savez-vous nager?

'Do you know how to swim / Have you learned to swim?'

b. *pouvoir:* 'be able to' (general ability)

Je *peux* soulever cette malle.

'I can / have power to lift this trunk.'

c. **savoir* / *pouvoir:* 'be possible' (possibillity) (cf. (31))

À Tokyo il **sait* / *peut* y avoir à tout moment un grand tremblement de terre.

'There can / may be a big earthquake at any moment in Tokyo.

d. **savoir* / *pouvoir:* 'be allowed to' (permission) (cf. (32))

Tu **sauras* / *pourras* sortir plus tard.

'You may go out later.'

Employing English CAN and MAY as the representatives of their Germanic counterparts and French SAVOIR and POUVOIR as those of their Romance correspondences, the facts observed above can be briefly restated as follows:

(40) a. MAY has lost its original meaning, whereas POUVOIR preserves its original signification 'to be able to'.

b. CAN has changed its primary meaning from 'to know (how to)', 'to be intellectually able to' or 'to have mental power to' to 'to be (generally) able to' or 'to have (general) power to' though SAVOIR preserves its original sense 'to know (how to)' or 'to be able intellectually'.

c. Although CAN has extended its signification, developing the meanings of Possibility, Permission, etc., SAVOIR has not undergone such semantic developments.

The issue of what has caused such differences between Germanic and Romance languages as stated in (40) must be resolved if we are to give a convincing explantion to problem (1).

3-2. DIFFERENTIATION

Putting aside (40a) and (40c) for the moment, let us begin by giving an explanation to the phenomenon stated in (40b): Why have CAN and its Germanic counterparts lost their older meaning

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and acquired the sense 'to be able to', formerly the primary meaning of MAY and its Germanic correspondences, while SAVOIR and its Romance counterparts have suffered no such change?

It seems plausible to consider that some fundamental difference lies between Germanic and Romance languages to generate a clear opposition of behavior between the Germanic counterparts of CAN and the Romance counterparts of SAVOIR. It is, however, obviously implausible to resort to the phenomenon of AUX-reanalysis as Nakano (1984) does, since it does not draw a line of demarcation between Germanic and Romance lauguages, but between English and other languages[11]. We have to search for some factor other than such a phenomenon of syntactic change.

In Section 1 we have noted that each present-day Germanic language preserves one cognate verb with the counterpart of CAN, originally a preterite-present verb. We have not yet seen whether Romance languages accommodate cognate verbs with the counterparts of SAVOIR in their vocabulary. As opposed to the Germanic languages, interestingly, no Romance language has a cognate verb with the counterpart of SAVOIR, which expresses the sense of knowledge or mental ability. The following chart illustrates this point:

(41)

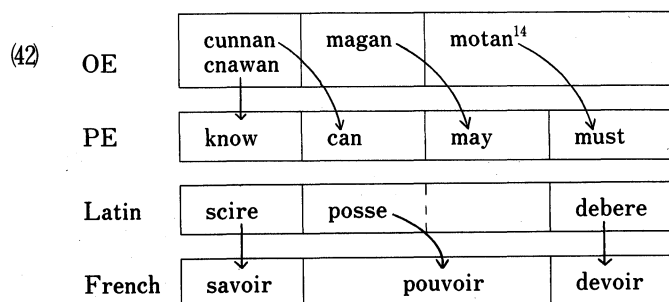|	SQĒI- (SAP-)[12]		ĜEN-		U̯ID-
IE root					
IE stem	......		ĝen- ĝn̥-		......
Germanic					
Gmc stem	......		kunn- knō-		......
			kann- → causative[13] knē-		
			(Go. kannjan)		
English	[......]		can {ken} know		{wit}
German	[......]		können kennen {-cnaan}		wissen
Dutch	[......]		kunnen kennen {......}		weten
Danish	[......]		kunne kende {......}		vide
Norwegian	[......]		kunne kjenne {......}		vite
Swedish	[......]		kunna känna {......}		veta
Romance					
Latin	scire		(co) (g) noscere		[videre]
French	savoir		connaître		[voir]
Italian	sapere		conoscere		[......]
Spanish	saber		conocer		[......]
Portuguese	saber		conhecer		[......]

—where braces stand for archaic or obsolete words for the standard use of the language, and square brackets for the words which are etymologically related to the above IE root but express

senses other than knowledge. (Irrelevant points are omitted, represented as '......')

(Cf. Walde (1927–32), Kluge (1975), etc.)

It seems that the variance in the relevant distributional character of vocabulary between Germanic and Romance languages charted in (41) has caused the difference between them stated in (40b).

Now, instead of (12), Nakano's (1984) diagram of the semantic changes of English modals, we would like to present our version of the diagram concerning the semantic changes of CAN and MAY, which is to be compared with the one for Romance languages, in the following fashion:

(42)

OE	cunnan cnawan	magan	motan[14]	
PE	know	can	may	must

Latin	scire	posse		debere
French	savoir	pouvoir		devoir

As clearly shown in the above diagram, CAN changes its meaning, making a semantic difference with KNOW. We have enough reason to postulate a linguitic mechanism for semantic changes which may be called SEMANTIC DIFFERENTIATION, or simply DIFFERENTIATION. Putting aside its various versions, Saussure's linguistic theory, especially the theory of *langue,* should be recalled here. As it is stated that "Dans la langue, il n'y a que des différences sans terms positifs" (Saussure 1967–74: III C403), his linguistic theory evaluates differences, which will stand between items, as more primitive than the items themselves, in other words, it is assumed that differences generate the items, but not vice versa. Then, we would naturally be lead to the hypothesis that one of the fundamental elements of the human linguistic activity *(langage)* is the act of making differences, that is to say, DIFFERENTIATION. I will not pursue any further theoretical backgrounds of the concept DIFFERENTIATION here, for the aim of this paper is rather an empirical study to explain the semantic changes of CAN and MAY. (For recent reinterpretations of Saussure's theory which are more or less concerned with the discussion here, see Derrida 1972 / 1981, Maruyama 1981, 1982, etc.)

To pursue the idea DIFFERENTIATION, we could envisage that enormous amount of activities identified as DIFFERENTIATIONs, which have been undertaken by so many people in the history of English whenever the items are used in their speech acts, have caused to bring the signification of CAN so far as to be different enough from that of KNOW. Since CAN and KNOW are originally from the same root, their meanings in OE are so similar that the state is not a stable one. Thus, we may say now that the mechanism called DIFFERENTIATION have caused the semantic change of CAN from 'to know (how to)' to 'to be able to'. The semantic changes observed in the other Germanic languages should be the same: DIFFERENTIATION has operated in the same fashion as in English between German *können* and *kennen,* Dutch *kunnen* and *kennen,* Danish *kunne* and *kende,* etc.

At variance with the Germanic languages, Romance languages have no cognate verbs with what signifies 'to know (how to)'. Thus, we can infer that the satus of SAVOIR and their counterparts have

been stable in the vocabulary of the respective languages since the Latin period. One might notice Latin *(g)noscere* (or *co(g)noscere* > French *connaître*, Spanish *conoscere* and Portuguese *conhecer*) and point out that here is a synonym of *scire* in Latin though it is not cognate with *scire*, and then wonder why DIFFERENTIATION does not operate between them so that the significations of SAVOIR and the correspondences are reanalyzed into 'to be able to'. We may say that the relation between *scire* and *(g)noscere* (or more usually, *novisse*, originally of perfect aspect) are stable enough in the same fashion as those between German *kennen* and *wissen*, Dutch *kennen* and *weten*, Danish *kende* and *vide*, etc.; since each pair are from different IE roots (cf. (41)), there has been a stable difference between them.

Now we would like to move to the problem stated in (40a): Why have MAY and its Germanic counterparts all given up their former primary meaning 'to be able to', while none of the Romance counterparts of POUVOIR have lost their original meaning. This seems straightforwardly explainable in terms of the assumption of the meachanism DIFFERENTIATION and the facts stated in (40b), upon which an explanation has already been given. Since CAN has changed its signification from 'to know (how to)' to 'to be able to' through DIFFERENTIATION, now the relation between CAN and MAY is unstable, viz., between them stands the least difference, so MAY has given up that meaning. The same expression is true for the other Germanic pairs in (2).

3-3. IMPLICATION

The remaining problem now is (40c): Why have CAN and its Germanic counterparts developed the senses of Possibility, Permission, etc., while SAVOIR and the Romance correspondences have been immune to such semantic developments? It seems that the facts stated in (40b) underlie this phenomenon; but this time some other mechanism than DIFFERENTIATION must be called to account.

It can be seen from the facts stated in (40c), in combination with those in (40b), that the modals signifying 'to be able to' develop other meanings, 'to be possible', 'to be allowed', etc., while the verbs signifying 'to know (how to)' never develop such meanings. As to Romance languages, on the one hand, this is entirely straightforward. Latin *scire* is never used to signify 'to be possible' or 'to be allowed to' (cf. OLD s. v. *scio*, etc.), and the same condition obtains for its offsprings in the present-day Romance languages (cf. (39) for the instances of French *savoir*). As to Germanic languages, on the other hand, CAN and its counterparts have changed its nature from only signifying 'to know (how to)' to signifying 'to be abe to' as their primary meaning and also express other meanings 'to be possible', 'to be allowed to', etc. through semantic developments, and so the matter appears rather complicated. A most illuminating view on this point is found in Traugott (1972: 171):

Mow (=MAY) was reinterpreted as expressing permission, but *koun* (=CAN) was not, presumably because some sense of the original distinction between physical and mental capacity remained: one can permit someone to do something, that is, not offer physical obstructions; but one cannot usually permit someone to know something intellectually.

In the above statement Traugott suggests that the difference in nature between the original meaning of

MAY and that of CAN crucially affects semantic developments though the statement remains an intuitive one and requires futher formalization.

Putting aside the point that the verbs signifying 'to know (how to)' never develop the sense of Possibility or Permission[15], we have here to identify the mechanism through which semantic developments occur as to the modal signifying 'to be able to'. There seems to be every reason to postulate what may be called IMPLICATION as such a mechanism. As far as this point is concerned, we should basically agree with the arguments in Aijmer (1986), which we have examined in the perevious section. Let us illustrate this by the instance of PE *can* with the help of Nakano's (1982) argument.

The primary meaning of PE *can* is, as stated before, 'to be able to' rather than 'to know (how to)'. CAN in the following sentence can be interpreted as expressing such sense:

(43) The coming typhoon *can* damage the crop.

Nakano (1982: 294—5) describes how other meanings develop fom such primary meaning of CAN as follows:

> ...... Suppose someone who knows a fact that a typhoon *can* (=has power to) damage his crop and is worried about the possible damage done to his crop by an approaching typhoon says, "The coming typhoon *can* damage my crop." He may very well be understood to be expressing his judgment (or his fear in this case) about the possibility that the coming typoon will damage his crop, rather than simply talking about the power of the typhoon. Here is the possibility of the semantic shift of *can* expressing the ability of someone (-thing) to *can* expressing the possibility of the occurrence of the event caused by his (its) ability, and further to *can* expressing speaker's judgment about that possibility.
>
> Once objective epistemic modality has developed out of dynamic modality, then there develops subjective epistemic modality out of the former. If some event *can* happen (i. e. there is a theoretical (=objective) possibility that it will happen), it implies that it *may* actually happen: "The typhoon *can* damage the crop" implies "The typhoon *may* (actually) damage the crop". Thus, the sense of theoretical possibility may, through implication, change into that of factual possibility, and if a possibility modal is used to express factual possibility as in "The coming typhoon *may* damage the crop", the sense of the modal becomes subjective (epistemic) possibility, or eventuality.

What is assumed to cause semantic developments here is almost equivalent to Aijmer's 'conversational background' or Grician's 'conversational implicature'. We can say that some pragmatic factor causes semantic develpments. Following Nakano (1982), let us call such a mechanism concening semantic developments IMPLICATION. We could say that if, through IMPLICATION, what makes the proposition 'The-coming-typhoon- damage-the-crop' possible changes from something inside the agent (e. g. his / her / its innate power, skill, etc.) to something outside the agent (e. g. some circumstances

surrounding the agent / speaker / hearer, etc.), then the meaning expressed by CAN develops from Inherent Ability to Possibility, etc.

There are many independent cases conceivable that will be well approached in terms of the mechanism IMPLICATION or the like. Although this is not the place for minute illustrations of such cases, Cole's (1975) approach to the semantic developments of PE *let's* in terms of 'conversational implicature' and König's (1985) investigation into the developments of concessive connectives in English and many other languages are especially to be recalled here.

3-4. Process of the Semantic Changes of CAN and MAY

In the preceding two subsections we have postulated two sorts of linguistic mechanisms (i. e. DIFFERENTIATION and IMPLICATION) to make a general approach to the semantic changes of CAN and MAY. Now, by means of such a hypothesis, we can more minutely approach the phenomenon of concatenative changes in meaning (cf. (42)). Semantic changes of CAN and MAY seem to be factored out into the following three stages, each produced by DIFFERENTIATION or IMPLICATION:

(44)

    Stage 1:   Semantic Developments of MAY

    'know'   'be able to'   'be possible', etc.

    KNOW   MAY   →   MAY

    CAN   (IMPLICATION)

    Stage 2:   Semantic Shift of CAN

    'know'   'be able to'   'be possible', etc.

    KNOW   MAY   MAY

    φ   →   CAN

      (DIFFERERENTIATION)

    Stage 3:   Semantic Loss of MAY

    'know'   'be able to'   'be possible', etc.

    KNOW   φ   MAY

      CAN

      (DIFFERENTIATION)

There are, of course, several remaining problems, such as the chronology of each of the above three stages in the history of English, the specifications of the later stages than the three above, etc. We will not pursue these matters here.

3-5. Further Evidence

So far we have approached the problem of the semantic changes of CAN and MAY stated in (1) in terms of DIFFERENTIATION and IMPLICATION. Although our approach seems explanatory, some counterarguments can be anticipated. One might allege that the fact that Germanic counterparts of CAN and MAY have suffered fairly drastic semantic changes, while the Romance offsprings of Latin

scire and *posse* have not, should be approached in terms of the social factors which surround the speech communities. This view would be as follows: No Romance language has altered the significations of Latin *scire* and *posse* because all the Romance speech communities have been strongly bound to the tradition of Latin, and none of the Germanic languages have succeeded in preserving the original meanings of CAN and MAY, and of the corresponding pairs, because they have no such authoritative parent language as Latin for Romance languages. One might, furthermore, criticize our analysis for treating *scire* and *posse* as the Latin counterparts of English CAN and MAY, respectively, though they have not derived from the same IE root, respectively (cf. (41)), and allege that Latin *scire* and *posse* etymologically have some innate characteristic that would prohibit semantic changes, whereas English CAN and MAY differ from Latin *scire* and *posse* in that they lack such etymological properties. In this subsection we will analyze the Russian data to refute such seemingly possible counterarguments.

Russian is more similar to Germanic langages than to Romance languages to the extent that it has no more authoritative ancestral language than a Germanic language has. Note, moreover, that Russian *moch'* 'to be able to' has derived from the IE root *MAGH-, and hence, is cognate with English MAY. (Cf. Walde 1927—32, s. v. *magh-*) Accordingly, if one maintains that a language that has no such authoritative ancestor as Latin for Romance languages shows semantic changes like those acknowledged with English CAN and MAY, or that items which have derived from IE *MAGH- are, in their nature, apt to give up the original signification, he would predict that Russian *moch'* would have lost its original sense, 'to have power to' or 'to be able to'. However, this prediction fails, and furthermore, our DIFFERENTIATION analysis accounts well for the Russian data.

Now see the chart (41) again. It can be seen that Germanic languages have at least two verbs derived from IE *ĜEN-, while Romance languages have only one. As far as this point is concerned, Russian is similar to Romance languages. It has only one verb derived from IE *ĜEN-, which corresponds to KNOW rather than to CAN: *znat'*, 'to know'. It is not followed by a bare infinitive, and does not express the sense of mental or intellectual ability, but merely that of knowledge, 'to know', etc. What expresses the sense of mental ability, followed by a bare infinitive is *umet'* ($<$ *um*, m. 'mind, intellect, wit'). Compare, for instance, the following two passages with (35) and (36), respectively:

(45) Jeremiah 1—6

o, Gospodi Bozhe! ya ne *umeyu govorit'*, ibo ya eshche molod.

'Ah, Lord God! Behold, I do not *know how to* speak for I am only a youth.'

(46) Genesis 20—6

i Ya *znayu*, chto ty sdelal sie v prostote serdtsa tvoego,

'Yes, I know that you have done this in the integrity of your heart.'

As to *moch'*, which is etymologically related to English MAY, it still preserves the meaning, 'to have power (to)' or 'to be able to'. The following passage is an instance of such use of *moch'*.

(47) John 10—21

mozhet li bes *otverzat'* ochi slepym?

'Can a demon open the eyes of the blind?'

(Cf. (11) and (37))

It also has developed other meanings expressing Possibility, Permission, etc., just as the French POUVOIR has. See the following instances:

(48) a . Russian *moch',* 'to be possible' (possibility):

On *mozhet* priekhat' i segodnya.

'He may come even today'.

    b . Russian *moch'* 'to be allowed to' (permission)

Vy *mozhete* ostat'sya u sebya: eta komnata — vasha.

'You can stay here for this room is yours.'

Mochu li ya poprosit' vas?

'May I ask you (a favour)?'

As we have just seen, Russian *znat', moch'* and *umet'* keep the time-honored significations. The historical semantic fields of these Russian verbs would be roughly depicted as follows (cf. Vasmer 1976–80, etc.), with the Romance one similar to it:

(49)

ORuss	znati	umeti	mochi
PRuss	znat'	umet'	moch'
Latin	(co) (g) noscere	scire	posse
French	connaître	savoir	pouvoir

The only semantic change concerning the now relevant Russian verbs observed in the above diagram is the extension of the significaion of *moch'.* It is no wonder that *moch',* whose original meaning is 'to have power (to)', hence, 'to be able to', has developed the senses of Possibility, Permission, etc. through IMPLICATION in the same fashion as the Germanic and Romance counterparts (viz., OE *magan,* PE *can,* French POUVOIR, etc.) have. Thus, the counterarguments that predicted that Russian *moch'* would have lost the etymological sense 'to have power to' or 'to be able to' because Russian has no authoritative ancestral language whose traditional force would block the semantic changes, or because Russian *moch'* has the same etymological feature as English MAY, causing it to lose its original meaning, have now been refuted. DIFFERENTIATION and IMPLICATION, however, satisfactorily explain why Russian *znat',umet'* and *moch'* have not undergone the type of semantic changes attested in Germanic languages. In the Russian semantic field of the verbs now at issue DIFFERENTIATION has never operated since there have not been any overlappings of terms, which can be found in the English semantic field (i. e. KNOW and CAN; cf. (42)). IMPLICATION, in turn, has

operated equally on Russian *moch',* on OE *magan* (or PE *can*) and on French POUVOIR since they all express the sense of (general) ability, 'to be able to', and thus the semantic developments to yield the significations 'to be possible', 'to be allowed', etc. are attested of these verbs in common.

4. Conclusion

Our aim in this paper was to give an explanation to the question (1): Why have CAN and MAY suffered such semantic changes as attested in many philological works? and What kind of linguistic mechanisms are concerned with such semantic changes? In contrast to other investigations, we have taken account of the basic difference in distributional character of the relevant items in the vocabulary between Germanic and Romance languages (and also the Russian language). The most crucial point of the semantic changes of CAN and MAY is, as it is claimed, the semantic overlapping between CAN and KNOW in some period in the history of English. In other words, one of the most important factors to have caused such semantic changes lies in the existence of KNOW in the English vocabulary. On the basis of this view, we have postulated two distinct but complementary linguistic mechanisms, DIFFERENTIATION and IMPLICATON, similar concepts to which are often referred to in the relevant literature. Since this paper aims for an empirical study of the semantic changes of CAN and MAY, all-embracing specifications of the nature of these two supposed mechanisms have been left open. One could freely raise questions, such as whether these two supposed mechanisms are in fact distinct entities, whether some general linguistic theory can integrate them, perhaps in combination with other mechanisms, or whether DIFFERENTIATION and IMPLCATION are indeed logically compatible theories. These are indeed interesting points not only in diachronic linguistics but also in synchronic linguistics, but, needless to say, we have to await further elaboration of explanatory linguistic theory to find a solution of such problems.

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NOTES

1. In the following example *magan* expresses the sense, 'to be strong', hence, 'to be healthy, fine':
   'Hu *mæg* he?' Hig cwædon ðæt he wel *mihte.*
   L. '*Sanus*ne *est?*' '*Valet*', inquiunt.

   (ASD)

   "'How fares he?' / 'Is he fine?' They said that he fared well / was fine."

2. It seems safe to say that this is due to the phenomenon which Lightfoot (1979: Chap. 2) assumes to be re-analysis of English modals into AUX.

3. The original Greek expression for this passage is as follows:
   Kaì oudeìs ep*ginóskei* tòn hyiòn ei mè ho patér,

4. Greek: mè daimónion *dýnatai* typhlôn ophthalmoùs anoîxai;

5. It is pointed out in Nakano (1984: 22) that it was in the early 17th century that CAN and MAY lost the meanings they had expressed in the OE period, 'to know how to' and 'to have power to'; it was in the early 16th century that MUST gave up its supposed original meaning 'to be permitted', and it was not until the 17th century that SHALL lost its earlier meaning 'to be compelled, have to'. See also OED, Traugott (1972: 198–9), etc.

6. This requires somewhat careful research, since there seem to be some variations among the ME documents,

depending on the period or the dialect in which they are written. In *Ancrene Riwle* (13C), for instance, CAN, both in the main verb use and in the use followed by an infinitive, corresponds to French *saveir* (> present-day French *savoir*) 'to know (how to)' with very few exceptions; what corresponds to French *pooir* (> *pouvoir*) 'to be able to, can' is MAY. (Ono 1969: 176) In Chaucer's *The Romaunt of the Rose* (1360—65) (Fragment A), however, there are cases where CAN corresponds to *pooir*, though usually CAN corresponds to *saveir* and MAY to *pooir*. (ibid: 186)

7. Instead of *cunnan*, OE *magan* can be used in a passive sentence with an inanimate subject, as illustrated below:

ðæt hwæðre *mæg* gastlice *ongyten beon*.

'it, however, can be spiritually perceived'

> Ælfred, Bede (Miller) 80,27
>
> (f. Visser 1963—73: § 1656)

8. According to Visser (1963—73: § 1656), the first instance of CAN embedded in a passive sentence with an inanimate subject is the following one, dated c 1443:

Manners ...... *which can* not so esili *be leerned*

> c1443 Pecock, Reule Cristian Religion 9

9. A rough sketch of the significations of present-day Germanic counterparts of MAY:

   (i)   German *mögen:* 'to like', 'may'

   (ii) Dutch *mogen:* 'to be allowed', 'to be possible'

   (iii) Norwegian *måtte:* 'to have to', 'may'

   (iv) Danish *måtte:* 'may, might', 'to be bound to', 'to be allowed to', 'must, have to, be obliged to'

   (v)   Swedish *måtte:* 'may' (expressing wish), 'must' (expressing certainty)

   　　　 må: let's (expressing exhortation), 'must (not)' (in connection with negation), 'may' (law)

10. For German *können,* see the following statement by Paul (1897: s. v. *können*):

    können: Die Grundbedeutung ist ein geistiges Vermögen, „wissen", aber schon in Mhd. wird es meistens nur gebraucht, wenn es sich um ein auf Tätigkeit bezogenes Wissen, eine erlernte Fertigkeit handelt. Dieser Gebrauch dauert im Nhd. fort. ...... Sicher auf erlernte Fertigkeit bezieht es sich in *eine Sprache, ein Handwerk, eine Kunst, Französisch können.* ...... An die Stelle des Wissens, Verstehens trat mehr und mehr die Vorstellung des Imstandeseins und damit die heutige Bedeutung, der zu dem älteren Gebrauch stimmenden Fälle unterordnen. Damit hat *können* die Funktion übernommen, die im Mhd. *mügen* (=nhd. *mögen*) hatte.

    As is clearly pointed out here, German *können* today expresses ability rather than bare knowledge even when followed by an accusative noun phrase rather than by infinitive. The same condition obtains for the other Germanic counterparts.

11. Namely, no other language than English, mentioned in this paper, seem to have suffered such reanalysis. Although we omit minute illustrations of this point here, it will suffice to exhibit those past participle forms of the relevant (modal) verbs in the languages other than English, which are to be used under perfect tense (cf. (19c), (20c), (21) and (22b)), or those infinitive forms (cf. (19a, b), (20a, b) and (22a)):

    (i)   German *können* (inf.) → *können [gekonnt]* (p. p.)

    　　　　 mögen → *mögen [gemocht]*

    (ii) Dutch *kunnen* → *gekund*

    　　　　 mogen → *gemoogd, gemogen, gemocht*

    (iii) Danish *kunne* → *kunnet*

    　　　　 må → *måttet*

    (iv) Norwegian *kunne* → *kunnet*

    　　　　 må → *måttet*

    (v)   Swedish *kunna* → *kunnat*

    　　　　 må (inf.)

(vi) French *savoir* → *su*

   pouvoir → *pu*

(vii) Italian *sapere* → *saputo*

   potere → *potuto*

(viii) Spanish *saber* → *sabido*

   poder → *podido*

(ix) Portuguese *saber* → *sabido*

   poder → *podido*

12. Morphologically speaking, the ancestral item of French *savoir*, Italian *sapere*, Spanish *saber* and Portuguese *saber* is Latin *sapere* (<IE *SAP-) 'to taste of' rather than *scire* (< IE *SQĒI-) 'to know'. For the details of this, see Ernout and Meillet (1932: s. v. *scio*), etc.

13. Although it is assumed that Enlglish *ken* and its Germanic correspondences originally expressed the causative sense, 'to cause to know' (cf. Gothic *kannjan*), today all of them express the non-causative sense, 'to know'.

14. Here, following Ono's (1969: 74–75) view, we tentatively assume that the original meaning of MUST (< OE *motan*) is not only 'to be permitted to' but also 'to be obliged to'.

15. For the formal approaches to this phenomenon, see Tanaka (1987, to appear).

ACKNOWLEDGMENT

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