

TOLERATING SUBJECT-EXPERIENCERS? YANG'S TOLERANCE PRINCIPLE APPLIED TO PSYCH VERBS UNDER CONTACT IN MIDDLE ENGLISH*

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ABSTRACT This article investigates the acquisition of psych verbs in diachrony by applying Yang's (2016) Tolerance and Sufficiency principles. It has been observed that psych verbs change from expressing the EXPERIENCER as object to expressing it as subject cross-linguistically. According to van Gelderen (2018) and others, this development has also taken place in the history of English. What is much less well-known, however, is that a considerable number of Old French psych verbs were copied to Middle English. Using lexicon-based and corpus-based data, we will apply Yang's (2016) Tolerance and Sufficiency Principles to evaluate historical "tipping points" in the development of the psych verb class, i.e. examine whether either *amuse*-type or *admire*-type argument structures were productive in Middle English. Since subject-EXPERIENCERS were commonly used with intransitive and reflexive constructions we will further investigate whether a more general rule that any psych verb may take a subject-EXPERIENCER passed the productivity threshold. We will show that this was indeed the case in Middle English and that the copying of Old French verbs accelerated this development.

1 INTRODUCTION

Psych verbs, which describe mental perception, cognition, and emotion, and involve an EXPERIENCER argument have received a lot of attention in the literature in theoretical, acquisitional and historical terms (for example Belletti & Rizzi 1988, Pesetsky 1995, Rappaport Hovav 2014, Grafmiller 2013, Pinker

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1989, Hartsthorne et al. 2016, Montrul 2001, Allen 1995, Möhlig-Falke 2012, van Gelderen 2018). It is generally assumed that there are two main types: the first type where the subject is the STIMULUS (or CAUSER) and the object the EXPERIENCER (*frighten/amuse*-type verbs). These verbs are said to describe an externally caused emotional episode (e.g. *she frightens him*). The second type of verb has the subject as the EXPERIENCER and the object as the STIMULUS (*fear/admire*-type verbs). They are said to describe a habitual attitude (e.g. *she fears him*) (see e.g. Levin 1993, Levin & Grafmiller 2013).

In chapter six of her book on the diachrony of verb meaning van Gelderen (2018) discusses changes in argument structure affecting this class of verbs. She focuses on the reanalysis from object-EXPERIENCER verbs to subject-EXPERIENCER verbs in the history of English, a good example of which is Old English (OE) *lician* ‘please’ (cf. Lightfoot 1979; Allen 1995). Scrutinizing her lists of Middle English (ME) psych verbs and examples reveals that quite a number of them are clearly copies¹ from Old French (OF). So the question arises whether verbs copied from OF, and therefore language contact, may have played a role in this development.

In studies of language acquisition a number of authors have experimentally investigated psych verbs because they are a test case for the *systematic mappings hypothesis* (Dowty 1991, Levin & Hovav 2005, Croft 2012). Whereas many authors claim that there is the aforementioned difference between *fear/admire*-type verbs and *frighten/amuse*-type verbs, this has been debated (e.g. Dowty 1991, Croft 2012). In a number of studies Hartsthorne et al. (2016) confirmed this claim. Hartsthorne and collaborators found that these two types of verb are systematically semantically distinct and that this distinction is productively used to guide linking by children at the age of four to five.

Yang’s (2016) Tolerance Principle (TP) (and Sufficiency Principle, henceforth SP²) is a mathematical model of learnability which provides a way to determine how much positive evidence in the input is sufficient to generalize a rule. More specifically, it is conceived as a general constraint on lexically dependent productive rules, specifying that for any class of N lexemes, learners will only postulate the existence of a productive rule if the class contains at most $N/\ln N$ exceptions. Failing this, it is more efficient from a processing point of view for learners to store each lexeme and its corresponding property individually rather than acquiring a general rule (cf. Yang & Montrul 2016). This model of learnability is of interest because it can be applied to the acquisition of argument structure and predicts changes in the productivity of rules

1 We will use the term ‘copying’ and ‘copy’ as suggested by Johanson (2002) instead of the traditional and problematic term ‘borrowing’. For a discussion see Trips (2020a).

2 For an explanation of the difference see Yang (2016: ch.6), Irani (2019) and further below.

which has implications for language change.

From this short discussion it has become evident that the acquisition of psych verbs as well as diachronic changes in this class of verbs are intriguing not only because of their lexical-semantic and syntactic properties but also because a number of aspects still haven't been explained. With our study we intend to contribute to this line of research and seek to investigate the acquisition of psych verbs in diachrony by applying Yang's principles. Specifically, on the basis of [van Gelderen's \(2018\)](#) study we will examine the development of object-EXPERIENCER verbs to subject-EXPERIENCER verbs in ME and further, whether contact influence from OF may have played a role.

We also seek to contribute to developing Yang's principles in that we apply them to historical data. To this day, few studies have done so ([Dresher & Lahiri 2015](#), [Dresher & Lahiri 2022](#), [Kodner 2019, 2020](#), [InPress](#)). An especially demanding task is to apply the principles to argument structure and to determine the class of *N* lexemes that a verb class contains (as well as *M*, the number of sufficiently attested lexemes). To test these principles we will concentrate here on the two main types of psych verbs discussed above: NP-subject-EXPERIENCER–NP-object-STIMULUS, NP-subject-STIMULUS–NP-object-EXPERIENCER.

Using both a lexical-based and a corpus-based approach and basing ourselves on the psych verbs of native and of French origin attested in the (lemma) lists of the *Tobler-Lommatzsch* dictionary of Old French (TL), the *Middle English Dictionary* (MED), and the *Penn-Helsinki Parsed Corpus of Middle English* (PPCME2), we will use the TP to evaluate historical "tipping points" in the development of the argument structures of these two classes of psych verbs in ME times. We hypothesize that subject-EXPERIENCERS played a critical role in the reanalysis described by [van Gelderen \(2018\)](#) and that the copying of OF verbs contributed to their increase.

The outline of the article is as follows: in section 2 we will discuss the development of the argument structure of psych verbs in OE and ME and the properties of psych verbs copied from OF. Section 3 first introduces Yang's Tolerance and Sufficiency Principles and how they can be applied to argument structure in general terms before we discuss our proposal to apply them to historical data. Section 4 first examines the productivity of the argument structure patterns discussed in section 2 by using the method outlined in section 3. Second, the properties of verbs copied from OF and the role that subject-EXPERIENCERS played in the development under investigation will be discussed. In section 5, we will look at whether changes in argument structure attested in ME can be accounted for by the productive rules discovered in section 4. Section 6 concludes.

2 THE DEVELOPMENT OF PSYCH VERB ARGUMENT STRUCTURE IN OLD AND MIDDLE ENGLISH

In this section we will first introduce the main types of psych verbs that can be differentiated according to Levin (1993) before we discuss work by van Gelderen (2018) which examines changes in this class of verbs between OE and ME.

Verbs denoting a psychological state typically take two arguments, their semantic roles being described as STIMULUS (or sometimes THEME, CAUSE) and EXPERIENCER). Levin (1993) identifies four classes of psych verbs in Present-Day English based on four different syntactic realizations of the EXPERIENCER and the STIMULUS NP: *amuse*-type verbs (1a), *admire*-type verbs (1b), *marvel*-type verbs (1c), and *appeal*-type verbs (1d):

- (1) a. *The clown **amused** the children.*
(subject-STIMULUS—object-EXPERIENCER)
 - b. *The tourists **admired** the paintings.*
(subject-EXPERIENCER—object-STIMULUS)
 - c. *Megan **marvelled** at the beauty of the Grand Canyon.*
(subject-EXPERIENCER—PP-STIMULUS)
 - d. *This painting **appeals** to Malinda.*
(subject-STIMULUS—PP-EXPERIENCER)
- (Levin 1993: 190f)

All *amuse*-type verbs can, however, appear with a subject-EXPERIENCER if used intransitively, without expression of the STIMULUS, and typically with an adverb (the middle alternation, see Levin (1993: 25–26)):

- (2) *Little children **amuse** easily.* (Levin 1993: 190)

Furthermore, a small number of *amuse*-type verbs are subject to the causative/inchoative alternation (cf. Levin 1993: 29, but Alexiadou 2016): while the transitive configuration produces a causative reading (3a, 4a), an inchoative reading is obtained with a subject-EXPERIENCER and with the STIMULUS optionally expressed by a PP. This is only grammatical for some verbs, such as *madden* (3b), but not most, such as *amuse* itself (4b):

- (3) a. *The sight of overflowing rubbish bins **maddens** me.*
b. *I **madden** (at the sight of overflowing rubbish bins).*
- (4) a. *The thought of telling them about it **amuses** me.*
b. **I **amuse** (at the thought of telling them about it).*

This flexibility in the argument structure of *amuse*-type verbs, in particular the ability to take the causative/inchoative alternation as in (3), is sometimes referred to as *lability* (e.g. Haspelmath 1993, Comrie 2006, McMillion 2006). Moreover, the existence of labile *amuse*-type verbs means that *marvel*- and *amuse*-type verbs are not mutually exclusive: *madden*, for instance is both of the *amuse*-type and the *marvel*-type in Levin's classification (1993: 193).

Taking this into account, and noting also the *appeal* class of verbs is very small indeed in Present-Day English, it would seem that the fundamental split in the psych verb class in Present-Day English is between the two personal transitive types: the *amuse*-type verbs and *admire*-type verbs (other authors refer to these classes as *fear*-type and *frighten*-type verbs, see e.g. Pesetsky 1995, Hartsthorne et al. 2016). Looking at the number of members (types) of the two classes in Levin's work at first sight it seems that the *amuse*-type class is much bigger than the *admire*-type class (113 vs 36 verbs), i.e. there are more psych verbs with an object-EXPERIENCER than with a subject-EXPERIENCER in Present-Day English.³ Bringing in contact-induced change and determining the origin of the verbs (by means of the *Oxford English Dictionary online* (OED)), reveals, however, that of a total of 113 *amuse*-type verbs 67 are of French (Latinate) origin (59%), whereas of a total of 36 *admire*-type verbs 23 are of French (Latinate) origin (64%). Taking into account the date of first attestation of the *amuse*-type verbs, 47 (41%) were copied from OF in ME times as compared to 16 for the *admire*-type class (44%). We can conclude that based on Levin's lists both classes of verbs were affected by the copying of OF verbs to ME to the same degree (compare Durkin's (2014) study of the influence of French/Latin words, p. 257). In fact, we will argue below that by strengthening the tendency for *amuse*-type verbs to be used reflexively with a subject-EXPERIENCER, contact with OF helped promote the productivity of *admire*-type verbs.

As mentioned in the previous section, van Gelderen (2018) discusses changes in argument structure affecting psych verbs. Van Gelderen states that cross-linguistically object-EXPERIENCER psych verbs have the tendency to develop into subject-EXPERIENCER psych verbs. In line with other authors (e.g. van der Gaaf 1904, Lightfoot 1979, Fischer & van der Leek 1983, Allen 1995) she assumes that this is also the case in English. She shows that a number of verbs like *loathe*, *like*, *weary*, and *fear* developed from *amuse*-type verbs to *admire*-type verbs (which she calls *frighten*-type and *fear*-type verbs). Others like *dread*, *hate* and *love* retained *admire*-type argument structure and some that al-

³ Although (Levin 1993: 19) notes that the sets of verbs she gives do not necessarily exhaust the membership of that class, she states that she tried to make the lists as comprehensive as possible.

ternated in earlier stages, like *grieve* and *delight*, were of the *amuse*-type first and then ‘flipped’ to the *admire*-type. She exemplifies the latter case with the OE verb *færan* ‘to frighten’ one example of which is given in (5).

- (5) *þa bodan us færdon*
 those messengers us frightened
 ‘The messengers frightened us.’
 (OED, Aelfric *Deut* i.28 in van Gelderen 2018: 152)

According to the MED *feren* has both meanings, ‘to frighten’ and ‘to fear’. The following examples illustrate this:

- (6) a. *He wile himm færenn ziff he maȝ*
 he will him frighten if he may
 ‘He wants to frighten him if he can.’
 (MED, c1175 Orm.(Jun 1), in van Gelderen 2018: 153)
- b. *Alle that company fere I ryth nouth.*
 all that company fear I right nothing
 ‘I do not fear that company at all.’
 (MED, ?a1475 Ludus C.(Vsp D.8))
- c. [...] *That of the noise and of the soun Men feeren hem in al*
 that of the noise and of the sound men frighten them in all
the toun Welmore than thei don of thonder.
 the town wellmore than they do of thunder
 ‘[...] so that men in the entire town fear the noise and the sound
 [of the bell] much more than they do thunder.’
 (MED, a1393 Gower CA Frf 3 3.454)

Meanings (6b) and (6c) with a subject-EXPERIENCER do not occur before the fourteenth century. Note that while van Gelderen (2018: 154) cites (6c) as an example of a ‘fear-type’ verb, in fact only examples such as (6b) show the unambiguous *admire*-type pattern of a subject-EXPERIENCER with a NP object-STIMULUS (cf. 1b above). In (6c), the subject-EXPERIENCER OCCURS instead in a reflexive construction with a PP-STIMULUS.

Interestingly, the two other alternating verbs that van Gelderen mentions, *grieve* and *delight*, were copied from OF (*grever*, *delitier*) to ME (*greven*, *deliten*). OF *grever* is clearly of the *amuse*-type (see 7a), but examples with reflexive constructions with a subject-EXPERIENCER exist as well (*se grever*) as the example in (7b) illustrates.

- (7) a. *Fos est qui devers lui se met, Qu'il*
 mad is who towards him REFL put.PRES.3SG for=he
viaut toz jorz grever les suens
 want.PRES.3SG all days harass.PRES.3SG the his
 'Anyone who goes to him is mad, for he always wants to harass
 those closest to him.'
 (TL, Clig. 675)
- b. *Douce dame ..., trop acheterai chiere L'amor, dont*
 sweet lady too-much buy.PRES.1SG dear the=love of-which
si me seux greveis
 so-much REFL be.PRES.1SG trouble.PST.PTCP
 'Sweet lady, I will pay a high price for love, which torments me
 so much.'
 (TL, Wackern. Afz. L XVIII 4, S. 32 (GProvins))

Similarly, the verb *delitier* 'to delight, to give pleasure' is also of the *amuse*-type but also exhibits reflexive use *se delitier/deliter a/de/en* (cf. Trotter 2001, Blumenthal & Stein 2002) as can be seen in the examples in (8). So both verbs seem to have been alternating in OF to some degree as well.

- (8) a. *les tūes consolatiuns deliterunt la meie aneme,*
 the your consolations delight.FUT.3PL the my soul
 'Your consolations will delight my soul.'
 (TL, Cambr. Ps. 93,19)
- b. *A une fenestre est assise, Ou mout se*
 at a window be.PRES.3SG sat where much REFL
delite a seoir
 delight.PRES.3SG to sit.INF
 'She is seated at a window where she loves to sit.'
 (TL, Clig., 2895)

Examining the ME copies of these verbs we find the following patterns. The first meaning of the ME verb *greven* is the *amuse*-type reading 'to injure, harass', first attested c1300 (MED, sense 1), see (9a). The structure with a subject-EXPERIENCER 'to feel angry' is found in reflexive use (MED, sense 3b), see (9b).

- (9) a. *Euer-eft he hath I-greued me.*
 ever since he has grieved me
 'Ever since he has harrassed me.'
 (MED, c1300 SLeg.(LdMisc 108)284/206)

- b. *At this tale I saugh no man hym greue But it were oonly Osewold*
 At this tale I saw no man him grieve but it was only Oswold
the Reue.
 the Reeve
 ‘At this tale I saw no man getting angry but only Oswold the
 Reeve’.

(MED, (c1390) Chaucer CT.Rv.(Manly-Rickert)A.3859 c1400(c1378)

Evidence from direct translations of OF texts like the *Somme le roi* (1279) confirms this. Dan Michel, author of the *Ayenbite of Inwyte* (1340) translates the verb into ME as an *amuse*-type verb as the following two examples show.

- (10) a. *And þanne alle speches and alle wordes hi tyeneþ and greueþ*
 and then all speches and all words him angered and grieved
 ...

‘and then all speches and all words angered and grieved him.’

OF: Adonc tuit language et toutes paroles li nuisent e li **grievent**

...

(Somme, ch.53,244)

- b. *and þe ualse wytnesses. þe ualse playteres, þe ualse lettres*
 and the false witnesses. the false lawyers, the false defendants
uor to greui opren. and trauayleþ þet uolk myd wrong.
 for to grieve others. and agonize the people with wrong.
 ‘and the false witnesses, the false lawyers, the false letters to
 grieve others and agonize the people wrongfully.’
 OF: les faus tesmoinz, les faus avocaz, les fauses latres por autrui
grever et travaillier les genz a tort, ...

(Somme, ch.36,110)

The first meaning of the verb *deliten* in the MED is ‘to delight in, to enjoy’ (MED, sense 1), either as a personal transitive or a reflexive construction (first attestation c1230 or possibly earlier), i.e. the *admire*-type reading, see (11a). The second reading ‘to give pleasure’ corresponding to the *amuse*-type is attested first in the *Ayenbite of Inwyte* (1340) (MED, sense 3), see (11b). Again these examples are evidence for a direct translation, here of the OF verb *delitier* (see the original OF sentences below the ME sentences in 11b). Also note that the majority of examples given in the MED for this reading exhibits passive constructions (*ben delited in/with*).

- (11) a. *þe lokinge and sight of her tyre ... makeþ hym to desire and*
 The looks and sight of her attire makes him to desire and

delite foule plesaunce of th synne of lechery.
 delight sinful pleasance of the sin of lechery
 ‘The looks and sight of her attire makes him desire and delight
 in sinful pleasure of the sin of lechery.’

(MED, ?c1450 Knt.Tour-L.(Hrl 1764)63/21)

- b. *huerby þe lostuolle guodes of the worldle guoþ in-to the herte uor*
 whereby the lustful goods of the world go into the heart for
 to *deliti*
 to delight
 ‘whereby the delightful goods of the world go into the heart to
 be pleasurable’
 OF: ou li bien delitable du monde antrent au cuer pour **delicier**

...

(MED, (1340) Aynb.(Arun 57)91/27, Somme (ch. 49, l.6))

Overall, it seems that the properties of both ME *greven* and *deliten* are properties of the OF verbs that were copied to ME (global copies in the sense of Johanson 2002).

A construction that should also briefly be mentioned here is the impersonal construction that many psych verbs displayed in OE times. For Allen these are verbs “... whose EXPERIENCERS were non-nominative in case-marking” (1995: 20) (see the bulk of literature on the proper definition of this term, e.g. Sweet 1891; Fischer & van der Leek 1983; Denison 1990; Allen 1995; for other Germanic languages see Barðdal 2004). Both *admire*-type and *amuse*-type verbs exhibited this construction. According to Möhlig-Falke (2012: 6) the most common pattern involves two arguments where the first argument is (pro)nominal marked with accusative or dative case and the second argument is a (pro)nominal marked with genitive case, a prepositional complement, or a (non)finite complement clause. Two examples of this type are given in (12):

- (12) a. *men sceamað for godan*
 men.ACC.DAT.PL feel shame.3SG for good.ACC.DAT.PL
dædan swyðor þonne for yfelan dædan
 deed.ACC.DAT.PL more than for evil.ACC.DAT.PL deed.ACC.DAT.PL
 ‘men are more ashamed of good deeds than of evil deeds’
 (WHom 20.1 [0031 (103)] in Möhlig-Falke 2012: 7)

- b. *ðu goda cyningc licað ðe*
 you.NOM.SG good.NOM.SG king.NOM.SG like.3SG you.ACC.DAT.SG

well þat Appolonius ... þus heonon fare.
 well that Appolonius thus from here go
 ‘good King, does it please you well that Appolonius ... departs
 from-here thus ...?’

(ApT (0179 (17.22)] in Möhlig-Falke 2012: 7)

In the course of the ME period the impersonal construction was lost, so we only sporadically find psych verbs that exhibit it:

- (13) a. *Him wondrede of þe grete liȝte þat he þere [i]say.*
 him wondered of the great light that he there saw
 ‘He was surprised by the great light that he saw.’
 (MED, a1325 SLeg.Magd.(1)(Corp-C 145)296)
- b. *So that the more me merueilleth What thing it is mi ladi*
 so that the more me marvels what thing it is my lady
eilleth.
 troubles
 ‘So that the more I am puzzled about the thing that my lady is
 troubled about.’

(MED, (a1393) Gower CA (Fr̄f 3)5.4481)

Since the construction is only attested with a small number of verbs, we will not take impersonal constructions into consideration when searching for productive rules of psych verb argument structure in section 4.

As shown above, ME psych verbs copied from OF generally exhibit the same argument structures as the OF verbs they derive from. This includes patterns that favour subject-EXPERIENCERS. This is in line with the more general observation that ME psych verbs appear to show a wider change towards expressing the EXPERIENCER as a subject rather than as an object (cf. van Gelderen 2018). Following Arad (1998), Alexiadou & Iordachioaia (2014) and others, van Gelderen assumes that the differences in the properties of psych verbs are due to aspectual properties. She shows that subject-EXPERIENCERS in OE/ME are stative but object-EXPERIENCERS are telic (involving causative structure like a causative morpheme) so the reanalysis involves a loss of telic aspect in favour of stative aspect (for further details see van Gelderen (2018: ch. 3)). The rise of causative light verbs and the use of the reflexive with the new meaning show that the inner aspect becomes ambiguous and this is why ‘additional’ material is needed to clarify a sentence’s aspect (van Gelderen 2018: 174). From our point of view psych verbs copied from OF to ME contributed to this change in that the majority of copied verbs were able to take a subject-EXPERIENCER and thus accelerated the change in the native verbs. In the next section we will demonstrate how Yang’s two principles can be used to model

the acquisition of the two types of psych verb in diachrony and to explain the change towards expressing the EXPERIENCER as a subject rather than as an object.

3 TOLERANCE AND SUFFICIENCY PRINCIPLES

3.1 *Overview of the Tolerance and Sufficiency Principles*

Charles Yang's (2016) Tolerance Principle (TP) is formulated as a constraint on the maximum number of exceptions to a productive rule within a particular class of items. The TP considers the formation of productive rules primarily from the point of view of a (child) language learner, as is based on the core assumption that "rules and exceptions are organized to optimize/minimize the time complexity of language use" (Yang 2016: 60). In practice, this entails assuming the Elsewhere Condition (Kiparsky 1973), i.e. that productive rules can only be applied to lexical items once speakers have processed a list of all exceptions to the rule. Thus, Yang argues that the greater the number of exceptions to a rule, the greater the required processing time for regular items.⁴ Given that more frequent items are in any case processed more quickly, where the number of exceptions within a class exceeds a certain threshold value, Yang argues that it is more time-efficient to dispense with general rules altogether: whether exceptional or rule-following, items are simply listed together with the applicable transformations (Yang 2016: 61). The Tolerance Principle provides a formula for determining the threshold at which processing regular items with a general productive rule become less time-efficient than listing all items:

(14) TOLERANCE PRINCIPLE (TP)

Let a rule R be applicable to N items, of which e are exceptions. R is productive if and only if:

$$e \leq \theta_N \text{ where } \theta_N := \frac{N}{\ln N}$$

(Yang 2016: 64)

For instance, to learn the regular 'add *-ed*' rule for past tense, on the basis of N (number of verbs in the child's vocabulary) the child compares e (number of verbs that do not add '*-ed*', i.e. the irregular verbs) against the value of the threshold θ_N . If e is lower than the threshold the rule is deemed productive;

⁴ In practice, this is difficult to observe directly due to the variety of other factors which affect overall processing time, in particular the stem and suffix frequency. See Yang (2016: 50–60) for detailed discussion.

if it is higher and exceeds the threshold the ‘add *-ed*’ rule is lexical and the child does not generalize beyond the list of verbs in the input that attaches the suffix for past tense.

Thresholds for a sample of values of N are given in Table 1. The values in Table 1 show that although the number of exceptions that a rule can tolerate increases with increased values of N , the proportion of items that can form an exception to a productive rule actually falls. So, for example, while an increase in class size from 100 to 200 items increases the number of possible exceptions from 23 to 38, in percentage terms the proportion of possible exceptions falls from 23% to 19%. This suggests that productive rules are more tolerant of exceptions when the learner has a smaller vocabulary.

N	θ_N	%
10	4	40.0
20	7	35.0
50	13	26.0
100	23	23.0
200	38	19.0

Table 1: Tolerance thresholds for a sample of values of N (Yang 2016: 67)

A corollary of the TP is the Sufficiency Principle (SP), which calculates at which point in the learning process positive evidence is sufficient for a rule R to be generalized. So, from the perspective of a learner gradually building up their mental lexicon, it follows that regular but not exceptionless correspondences between items and applicable transformations in a class are only analysed as productive rules if the number of exceptions is below the threshold given by the TP, i.e. there are sufficiently few exceptions to make it more time-efficient to employ the ‘exceptions-and-rule’ processing method:

(15) SUFFICIENCY PRINCIPLE (SP)

Let R be a generalization over N items, of which M items are attested to follow R . R can be extended to all N items if and only if:

$$N - M < \theta_N \text{ where } \theta_N := \frac{N}{lnN}$$

(Yang 2016: 177)

According to Yang (2016: 177), when M (items that are attested to follow R) sits below the Sufficiency threshold learners lexicalize all M items and do not generalize beyond them. Only when M crosses the threshold does R become

a productive rule. Although the TP and SP are two sides of the same coin one difference remains: whereas the TP keeps track of exceptions to a rule, the SP “... asserts that unless the Sufficiency threshold has been crossed, learners are in a state of ambivalence regarding ($N - M$) items with which they have no direct experience: ‘I don’t know’ is an acceptable answer” (Yang 2016: 178).

The SP in particular has a number of important consequences for the process of language acquisition and by implication for attested patterns of language change. First and foremost, Yang argues that it correctly predicts the point at which child learners first start employing regular rules in particular classes. In the case of the acquisition of the English past tense, Yang (2016: 84) shows that the productivity of the ‘add *-ed*’ morphological rule is only apparent once the thousand most frequent verbs have been acquired; it is at this point, he argues, that over-generalization errors (such as *feeled* for *felt*) first begin to appear. Second, the Sufficiency Principle implies that patterns can be regular without being productive, if they fall under the threshold value. In this case, without positive evidence, speakers are unable to produce the transformation of an item. Yang argues that this may lead to paradigmatic gaps: for example, he shows that although there are a number of patterns in the relationship between the past tense and the past participle of English irregular verbs (e.g. ‘add *-n* to past tense’ in the case of *broke–broken* or *chose–chosen*), no pattern reaches the threshold of productivity, and therefore, once a past participle becomes so infrequent as to no longer be learnable, such as the past participle of *strode*, it is not possible for speakers to productively innovate a replacement, leaving a gap in the morphological paradigm.

Now that we have introduced Yang’s principles and shown that they provide an interesting way to model the acquisition of rules and patterns of language change we will show how they can be applied to argument structure in general and to ME psych verbs specifically.

3.2 *Application of the Tolerance and Sufficiency Principles to argument structure*

Although many of Yang’s examples are drawn from the domain of inflectional morphology, the TP and SP have been extended to other types of lexically-determined properties, including argument structure. Important initial studies of this kind include the application of the TP to the Icelandic Dative Substitution (Yang 2016: 160–170) and the English double object construction (Yang & Montrul 2016, Kodner 2019). Further studies that have applied the TP and SP are Schuler, Yang & Newport (2016) conducting an artificial language experiment, Schuler (2017) investigating child and adult acquisition and Irani (2019) investigating the acquisition of verb argument structure.

Icelandic Dative Substitution is an ongoing change in which dative case

is extended to EXPERIENCER arguments which historically take the accusative (e.g. *langa* ‘to want’, cf. Jónsson & Eythórsson 2011: 217). Using data from Eythórsson (2002), Yang shows that in Modern Icelandic, of 264 verbs which assign an EXPERIENCER thematic role (N), 227 take the dative. The 37 exceptions which still take the accusative fall below the tolerance threshold ($\theta_{264} = 47$), meaning that use of the dative for EXPERIENCER arguments is a productive rule, which is correctly predicted to be extended (2016: 165). A similar pattern emerges when the calculation is based on the lexicon of six individual native speakers rather than on a dictionary-derived word list: for example, Speaker 6 in Yang’s survey recognized only 81 experiencer verbs, of which only 18 would traditionally take the accusative, a result which places the generalization of dative experiencers “right around the cusp of productivity” ($\theta_{81} = 18$) (Yang 2016: 168). In common with cases in inflectional morphology, Yang assumes that only one of two case options is available in the speaker’s grammar. With regard to the application of the TP, this would imply that the use of an accusative EXPERIENCER constitutes positive evidence of an exception to the productive ‘dative EXPERIENCER’ rule. Yet this assumption runs into empirical difficulties when confronted with variation in the data, and in a study of 900 11-year-old native speakers, Jónsson and Eythórsson show that case use is not consistent. For example, the EXPERIENCER of the verb *sviða* ‘to smart, sting’ was realized in the accusative by 43.4% of speakers and in the dative by 52.9% (2005: 232). In our study, we are faced with a similar situation in that a number of verbs show variation between *amuse*-type and *admire*-type argument structure, and it is not clear from the data that the two structures are mutually exclusive. We return to this issue in section 5.

In the cases discussed so far, it is assumed that the learner is trying to answer a question of the form: ‘which form x' is grammatical when lexeme x is used in construction c' ? The learner can safely assume the existence of form x' — i.e. the past participle of a verb, or the case assigned to the EXPERIENCER argument — and can expect to encounter positive evidence for or against any hypothesis about x' in the input. Yet the SP can also be applied to a different kind of question, namely ‘does lexeme x occur in construction c' ? This is illustrated by Yang’s (2016: 190–213; also Yang & Montrul 2016) ‘resolution’ of Baker’s Paradox (1979): the observation that there can be no possible positive evidence that double object constructions such as **I donate John the book* are ungrammatical with some verbs, yet speakers successfully acquire this restriction. Yang proposes the following explanation:

- a. A child learner observes a set of verbs V_1, V_2, \dots, V_M that participate in the syntactic form of “V NP NP.”
- b. The learner proceeds to inductively identify a semantic

- class C , over the verbs V_1, V_2, \dots, V_M .
- c. The learner identifies the total number of verbs ($N, N \geq M$) that fit the structural description of C .
 - d. If $(N - M) < \theta_N$ then the learner extends the use of double objects to all members of C .
 - e. Otherwise the learner lexicalizes the M verbs as allowing double-objects but will not extend the construction to any other item. (Yang 2016: 198).

In the case of the double object construction, the semantic class in question is that of verbs expressing caused possession (Yang 2016: 201), since the vast majority of the verbs first encountered in this construction share these semantics. Subsequently, in step (d.), the learner seeks to reverse the implication, evaluating whether a sufficient number of verbs of caused possession are attested in the double object construction. Yang shows that with a small lexicon of 42 verbs (typical for one year of CDS), this is indeed the case, leading to overgeneralization errors such as *I said you no* (2016: 203–204). However, as the lexicon is enlarged with verbs of caused possession which are *not* attested in the double object construction, the learner subsequently re-evaluates the productivity of the rule and retreats from the initial generalization (2016: 206–212). Crucially, generalizations of this kind are based only on two pieces of positive evidence: the set of verbs of caused possession (N) and the number of these verbs attested in the double object construction (M).

There are clear parallels between this case and our data. There are a number of possible argument structures attested for psych verbs in ME, and a single verb may show a variety of argument structures, for example through labiality, use of the reflexive, or the impersonal construction, as discussed in section 2. The mutual compatibility of different argument structures for ME psych verbs indicates that the existence of one construction cannot be taken as positive evidence for the impossibility of another. Therefore, as with the Present-Day English double object construction, for each different argument structure learners will adopt a strategy based on the number of verbs within the psych verb class which show positive evidence for its existence, evaluating whether or not it is attested with a sufficient number of psych verbs to be productive.

3.3 Applying the Sufficiency Principle to Middle English verbs

It is clear from the outset that applying the TP and SP to historical corpus data poses a number of significant difficulties. First and foremost, we must

attempt to assign a value to N , i.e. we must calculate the total size of the class of ME psych verbs. This necessitates both a clear definition of a ‘psych verb’, including in cases of polysemy, and of ‘Middle English’, a term which encompasses a 450-year period of an unstandardized language. We will refer to this as the CLASS SIZE PROBLEM. Second, when applying the Sufficiency Principle, we must assign a value to M , i.e. we must show that a verb is ‘attested’ with a particular argument structure. This we will refer to as the ATTESTATION PROBLEM. Third, and perhaps more fundamentally, both Principles are designed to apply across the lexicon of the individual native speaker, yet historical data is based on the written productions of a literate few who are unlikely to have had identical grammars. We will term this the DATA COMPATIBILITY PROBLEM. While we cannot provide definitive solutions to these problems in this article, we will justify how we have addressed them in our study.

3.3.1 *The Class Size Problem*

Addressing the CLASS SIZE PROBLEM requires us to list all the verbs which are considered to be ‘Middle English psych verbs’, which requires a more precise definition both as to what is classed as ‘Middle English’ and as to what is classed as a ‘psych verb’. As a first approximation, we created as large a list as possible of verbs which could conceivably be classed as ME psych verbs (see Table 8 in the Appendix). First, we took Levin’s (1993: 188–193) list of modern English psych verbs and traced their etymology using the *Oxford English Dictionary* (OED) and the *Middle English Dictionary* (MED). Added to these were psych verbs mentioned in Möhlig-Falke’s (2012) study of the ME impersonal construction and Allen’s (1995) study of OE argument structure, and finally psych verbs cited by van Gelderen (2018) and García García & Ingham (Forthcoming). Using both the MED and the OED, we created a table listing all of the attested psych meanings for each of the verbs including the date at which this meaning was first attested. The etymology of each verb was also noted, allowing us to divide the verbs studied into French-based verbs (FBVs), i.e. verbs either copied from French or created in ME from morphemes copied from French, and non-French-based verbs (nFBVs). We did not consider any verb first attested after 1400 or last attested before 1066 in order to concentrate on the lexicon at the time when contact influence from French was at its greatest (cf. Ingham 2012). We systematically excluded:

- verbs first attested with a psych meaning after 1400 (e.g. *daunten* ‘to overcome’ or ‘to bring to subjection, to tame’ in ME);
- Old English psych verbs not attested after 1066 (e.g. *(of)earmian* ‘to cause grief, commiserate’);

- verbs in closely-related semantic classes with EXPERIENCER arguments (e.g. verbs of desire⁵ or judgement verbs).

This first approximation gives a list of 146 verbs attested with a psych meaning in at least one text between 1066 and 1400, and these are listed in the Appendix. Yet this list is clearly only a maximalist best estimate, since it is sufficient for a verb to be attested once with a psych meaning in one text in the given time period for it to be included. In order to eliminate hapaxes and extremely infrequent verbs, which would not have existed in the lexicon of native speakers, we use corpus data to estimate which of the verbs would be found in the lexicon of a ME speaker around 1400. To this end, we counted all tokens of the listed psych verbs in sections M3 and M4 of the PPCME2, covering the period 1350–1500, and ranked them in order of frequency. Of the 146 psych verbs, only 90 were actually attested in the corpus.

By dividing the class in this way, we are able to perform a series of SP analyses on both a maximal and a more reduced and perhaps more realistic estimate of the set of ‘ME psych verbs’. If the same result is reached for rule productivity on different class sizes, then we can draw relatively secure conclusions; if not, the analysis will signal areas of further investigation.

3.3.2 *The Attestation Problem*

Having established the list of psych verbs, we then require a list of all possible argument structures with which the verb was attested. Here, we used the definitions and the citations in the MED to identify which of the argument structures listed in section 2 were found for each verb, noting also the date of first attestation. Given the large number of possible argument structures and the relatively rarity of some of the verbs on the list, we included all argument structure configurations listed in the MED, even where the first attestation of a particular argument structure was in the period 1400–1500. Unlike our approach to the CLASS SIZE PROBLEM, we did not cross-reference the argument structures attested in the MED with corpus data from the PPCME2. The advantage of this approach is that, for rarer verbs in particular, only lexicographical resources such as the MED are based on a database broad enough to record the full range of possible argument structures. On the other hand, it is more difficult to exclude tokens of genuinely rare or idiosyncratic argument structures which are unlikely to have figured in the grammars of many learners.

⁵ E.g. we did not include ME *listen* and *longen*.

3.3.3 *The Data Compatibility Problem*

The TP and SP are designed to operate on the lexicon of a language learner and have been most extensively tested with corpora of child-directed speech (CDS) from the *Child Language Exchange Data System* (CHILDES) corpus (cf. Yang 2016). Data from lexicographical resources and from literate adult written productions is clearly not the same as CDS, which poses the question as to whether it is appropriate to use the TP and SP on such data and, perhaps more importantly, which methodology best ensures equivalence. Some answers to these questions are provided by Kodner (2019). Firstly, through a comparison of the proportion of different verb types in modern English (e.g. irregular vs regular verbs, Latinate vs non-Latinate verbs), he shows that proportions are similar in CDS and in written sources from the *Corpus of Contemporary American English* (COCA), in particular when the class size is limited using “frequency trimming”, i.e. studying only the most frequent 100 or 500 verbs (2019: 3–6). It therefore appears that limiting the class size has a positive effect on data equivalence and thus results from smaller datasets may paradoxically be more reliable indicators of productivity. Consequently, we generated a third possible class consisting of the 30 most frequently psych verbs in the PPCME2 (‘Top 30’ in the tables). Our calculations are also checked against this smaller class.

Secondly, Kodner compares the verb lexicon attested in an historical corpus (the Latin Perseus corpus, Smith, Rydberg-Cox & Crane 2000) and in a list of reconstructed verbs for proto-Germanic (Seebold 1970) with the lexicon of English and Spanish CDS. Since here different languages are being compared, the comparison is based on verb meaning, using a frequency cut-off of around 260 verbs to ensure that all compared lexicons were of the same size. A baseline overlap of 81.71% was calculated from two different corpora of modern English CDS. The results show that the overlap between the verb meanings expressed in CDS and in historical corpora is consistently within 15% of this baseline figure (i.e. between 66.7% and 79.62%, depending on the languages compared). Kodner interprets this as a positive finding, concluding that “lexical overlap is conserved between CDS, adult historical corpora, and reconstructed lexicons about as well as between CDS lexicons” (2019: 7). Moreover, he attributes much of the divergence to cultural differences, as the Iron-Age speakers of proto-Germanic naturally used verbs meaning ‘to weave’ or ‘to knead’ whereas they are far less common in modern CDS (2019: 7). An important conclusion that we may draw from these findings is that the most frequently attested verb meanings found in historical corpora broadly correspond to the most frequently attested verb meanings in CDS. Furthermore, in the specific case of psych verbs, it seems unlikely that his-

torical cultural change has fundamentally changed the most commonly expressed concepts. Consequently, in the present study, we consider that the data from lexicographical resources and corpora, in particular when a relatively small class size is considered, is sufficiently equivalent to CDS to be used to approximate the child lexicon.

4 PRODUCTIVE RULES OF MIDDLE ENGLISH PSYCH VERB ARGUMENT STRUCTURE

In this section, we apply the SP using the method outlined in section 3 to the class of Middle English psych verbs to ascertain whether it is likely that learners would have identified any argument structure as productive across the whole class of psych verbs. We begin by evaluating whether either *amuse*-type or *admire*-type argument structures are productive in ME (4.1) before considering whether a more general rule that any psych verb may take a subject-EXPERIENCER passed the productivity threshold (4.2). Finally, we turn to the role that contact with French played in shaping the attested argument structure for psych verbs in ME (4.3).

4.1 Productivity of *amuse*-type and *admire*-type argument structure

The data in Table 2 and Table 3 contain a SP analysis of the productivity of *amuse*-type and *admire*-type argument structure respectively for ME psych verbs.

	All	PPCME2	Top 30
N	146	90	30
<i>amuse</i> -type (M)	106	67	19
$N - M$	40	23	11
Threshold (θ_N)	29.3	20.0	8.8
Productive? ($N - M < \theta_N$)	no	no	no

Table 2: Sufficiency Principle analysis of the productivity of *amuse*-type argument structure on three different lexicon sizes.

Each analysis is carried out for all three sizes of lexicon described in section 3.2: ‘All’ refers to all 146 attested verbs, ‘PPCME2’ to those verbs attested in subcorpora M3 and M4 of the PPCME2 and ‘Top 30’ to the thirty most frequent verbs. The number of verbs in each subcorpus (N) is compared to the number of verbs attested with the type of argument structure in question

	All	PPCME2	Top 30
N	146	90	30
<i>admire</i> -type (M)	46	32	14
$N - M$	100	58	16
Threshold (θ_N)	29.3	20.0	8.8
Productive? ($N - M < \theta_N$)	no	no	no

Table 3: Sufficiency Principle analysis of the productivity of *admire*-type argument structure on three different lexicon sizes.

(M). The number of verbs is only sufficient for a type of argument structure to be considered productive if the number of verbs for which the learner has no positive evidence that it can be used, i.e. $N - M$, falls under the tolerance threshold. Verbs like *deliten* which show both argument structures are included in both tables.

The headline result of the analysis is that the SP predicts that neither type of argument structure is attested for a sufficient number of psych verbs for a learner to posit that it is a productive rule. We therefore have no reason to suppose that either *amuse*-type or *admire*-type argument structure will be extended to new verbs diachronically. For *admire*-type argument structure (Table 3), the analysis is robust, since this type is in the minority for every size of lexicon considered. For *amuse*-type argument structure (Table 2), the picture is less clear, in particular for the two smaller lexicon sizes. For both the Top 30 verbs and the verbs attested in the PPCME2, the number of verbs with *amuse*-type argument structure falls only three short of the productivity threshold.

How reliable are these results? On the one hand, although the TP “lives and dies by the number” (Yang 2016: 70), it would be foolhardy to claim that the value of N is anything more than a best estimate and is unlikely to correspond to the grammar of any individual speaker (the CLASS SIZE PROBLEM), and the same is true of the value of M , which is based on the argument structures recorded in the MED (the ATTESTATION PROBLEM). So results this close to the threshold cannot be unquestioningly accepted, and we cannot exclude the possibility that, for some learners at some point in their linguistic development, the number of verbs showing *amuse*-type argument structure could have crept over the productivity threshold. On the other hand,

it is significant that the result holds across all three class sizes. Moreover, we also see little evidence that *amuse*-type argument structure becomes extended to verbs in English which were previously of the *admire*-type; indeed, the primary change discussed in previous work is the extension of subject- rather than object-EXPERIENCERS. In this respect, the lack of productivity of the *amuse*-type argument structure predicted by the SP corresponds with the lack of extension of *amuse*-type argument structure observed diachronically.

4.2 Productivity of subject-EXPERIENCERS

Although *admire*-type argument structure with a subject-EXPERIENCER and an object-STIMULUS is only found with a minority of verbs, subject-EXPERIENCERS are found far more frequently in the data due to the multiple argument structures shown by many verbs. As discussed in section 2, verbs such as *greven*, which show *amuse*-type argument structure when a direct object is realized, can also be used reflexively, causing the EXPERIENCER to be used as the subject. The EXPERIENCER can also be realized as the subject in non-reflexive constructions with the STIMULUS either realized as a preposition or omitted entirely. We therefore chose to carry out a SP analysis on the overall productivity of subject-EXPERIENCERS in ME psych verbs, regardless of the realization of the STIMULUS argument, i.e.:

- (16) SbjEXP RULE: If V is a psych verb, it can be used with a subject-EXPERIENCER.

The SbjExp rule is productive if and only if the difference between the number of known psych verbs (N) and the number of these psych verbs attested with a subject-EXPERIENCER (M) is less than θ_N .

The results of the analysis are shown in Table 4, and suggest that learners would indeed have acquired a productive SbjExp rule in ME. The result holds for all three class sizes; however, in the smallest class size it is extremely robust, with only four of the most frequent thirty psych verbs not attested with a subject-EXPERIENCER. Even given the inaccuracies inherent in estimating N and M for historical data, this is a strong indication that even with a small vocabulary, learners of ME would have concluded that all psych verbs could be used with a subject-EXPERIENCER in some configuration. The existence of a productive rule also suggests that the use of subject-EXPERIENCERS is likely to be extended to new verbs as suggested by previous studies. However, our analysis adds an important qualification: since the productive rule applies to the realization of the EXPERIENCER rather than that of the STIMULUS argument, we do not expect this to lead directly to the extension of *admire*-type argu-

ment structure. Instead, we would expect to see an increase in all types of argument structure with a subject-EXPERIENCER, including forms with no STIMULUS argument or with a PP, i.e. intransitives and reflexives. We will return to this prediction in section 5.

	All	PPCME2	Top 30
N	146	90	30
subject-EXPERIENCER (M)	118	72	26
$N - M$	28	18	4
Threshold (θ_N)	29.3	20.0	8.8
Productive? ($N - M < \theta_N$)	yes	yes	yes

Table 4: Sufficiency Principle analysis of the productivity of an argument structure with a subject-EXPERIENCER on three different lexicon sizes.

In the next section we will take a closer look at the role that French-based verbs with subject-EXPERIENCER played and connect them to their OF counterparts to discuss the contact hypothesis in more detail.

4.3 The role of French-based verbs

As discussed in section 2, a significant proportion of the psych verbs in ME are copied from French or derived in ME from morphemes copied from French (French-based verbs, FBVs). If FBVs are the source of the rise in subject-EXPERIENCERS, we would perhaps expect to find a higher percentage of FBVs providing positive evidence for the SbjExp rule than non-French-based verbs (nFBVs).

Table 5 divides the two classes of ME psych verbs into FBVs and nFBVs and shows for each class size the percentage of verbs of each type attested with a particular argument structure. So, for example, of the top 30 most frequent psych verbs, seventeen are FBVs and thirteen nFBVs, and of the seventeen FBVs, 70.6% show *amuse*-type argument structure, 35.3% show *admire*-type argument structure, and 76.5% show subject-EXPERIENCERS. However, from Table 5 it is clear that the percentage of nFBVs with subject-EXPERIENCERS is very high in all class sizes: 88.3% of all 77 nFBVs, 89.7% of the 39 nFBVs attested in M3 and M4 of the PPCME2, and 100% of the thirteen nFBVs in the top 30 most frequent psych verbs. From a purely quantitative point of view, the data do not at first sight appear to support the hypothesis that the increase in FBVs drove the increase in subject-EXPERIENCERS.

	All	PPCME2	Top 30
<hr/>			
FBVs			
<i>amuse</i> -type	73.9% (51)	78.4% (40)	70.6% (12)
<i>admire</i> -type	26.1% (18)	29.4% (15)	35.3% (6)
subject-EXPERIENCER	72.5% (50)	72.6% (37)	76.5% (13)
Total	100% (69)	100% (51)	100% (17)
<hr/>			
nFBVs			
<i>amuse</i> -type	71.4% (56)	69.2% (28)	53.9% (8)
<i>admire</i> -type	36.4% (28)	43.6% (17)	61.5% (8)
subject-EXPERIENCER	88.3% (68)	89.7% (35)	100.0% (13)
Total	100% (77)	100% (39)	100% (13)

Table 5: Comparison of argument structures attested for FBVs and nFBVs in Middle English expressed as a percentage of the total number of FBVs or nFBVs respectively in each class size. Number of verbs in parentheses.

However, Table 5 also shows that although the majority of the FBVs exhibit *amuse*-type argument structure when used transitively, over 70% of all verbs can also be used with subject-EXPERIENCERS. This demonstrates that many French *amuse*-type verbs also show an alternation between personal transitive *amuse*-type argument structure and intransitive or reflexive uses with a subject-EXPERIENCER, as discussed in section 2.

To what extent was this alternation characteristic of psych verbs in the source language, i.e. French? In order to answer this question, we examined the argument structure of the copied psych verbs in continental OF based on the entries in the *Altfranzösisches Wörterbuch* (Tobler & Lommatzsch 1925ff). Included on the list are a total of 53 verbs which had a psych meaning in OF and were copied into ME with that meaning. These are shown in Table 6. As not all OF psych verbs were considered and the verbs examined thus do not constitute a coherent full class in OF, it is not appropriate to carry out a SP analysis on these frequencies. Nevertheless, it is clear that the copied verbs show similar patterns of argument structure to the ME psych verbs: the majority take *amuse*-type argument structure but there is a significant minority of *admire*-type verbs, and most verbs can take subject-EXPERIENCER argument structure either intransitively or reflexively. Overall, this is a more positive finding for the contact hypothesis, since it suggests that the argument struc-

ture of ME psych verbs looked generally similar to that of the set of French verbs from which many were derived, in particular with regard to the high frequency of alternations involving subject-EXPERIENCERS.

	No. of verbs
<i>amuse</i> -type	58.5% (31)
<i>admire</i> -type	26.4% (14)
subject-EXPERIENCER	81.1% (43)
Total	100% (53)

Table 6: Argument structure in French of the verbs copied into Middle English

Similar contact effects have been reported by [Ingham \(2020\)](#) and [García García & Ingham \(Forthcoming\)](#). [Ingham \(2020\)](#) investigated whether PATIENT-lability (i.e. intransitive use) of ME change of state/location verbs was influenced by contact with OF. Examining lexicographical resources for OE, ME and OF (including Anglo-Norman) he found that, in contrast to OE verbs, ME verbs of this semantic class displayed a large expansion of lability to nearly three-quarters of the verbs belonging to this semantic domain. Crucially, this effect was especially strong with verbs copied from OF, e.g. *rosten* was given the same alternating linking to syntax as those of OF *rostir*. Furthermore, contact effects can also manifest themselves in the replication of OF argument structural properties in native ME verbs. Ingham also found this more indirect effect of contact with OF (e.g. *awaken* on the model of *esveiller*, p. 461). Overall Ingham concluded that contact with OF drove PATIENT-lability in the class of change of state/location verbs in ME.

[García García & Ingham \(Forthcoming\)](#) extended Ingham’s study to two further semantic verb classes: psych verbs and *destroy*-verbs (cf. [Levin 1993](#)). For the latter class they found a small but non-lasting effect. For the former class they found a contact-induced increase in lability that, however, could never really expand its scope in the same way as was the case with the class of change of state/location verbs. [García García & Ingham](#) interestingly attribute this to their observation “... that psych verb lability in the source language (French) was being challenged strongly, and crucially at the period of maximal contact influence on English, by a competitor, the reflexive construction” (p. 18). This finding fully supports the results that we have presented above (see also section 5).

This kind of contact influence can be expected to have occurred in medieval England. In line with [Ingham \(2012, 2020\)](#) we assume that by the end of the 12th century a bilingual speech community existed which exhibited

individual bilingualism rather than societal bilingualism. It is well-known that this form of bilingualism favours contact influence (see e.g. Fernández, de Souza & Carando 2016). The quantitative results of FBVs presented in Table 5 can be interpreted as contact effect and support Ingham's and García García & Ingham's findings and assumptions about how OF influence affected different types of verb classes to different degrees (for further studies see Trips & Stein 2019, Trips 2020a,b).

5 EXTENSION WITHOUT PRODUCTIVE RULES? FROM *AMUSE*-TYPE TO *ADMIRE*-TYPE

As we discussed in section 2, there are a number of verbs such as *feren* whose personal transitive argument structure “flips” from *amuse*-type to *admire*-type in the history of English. At the same time, the SP analysis carried out in section 4 clearly indicates that no learner of Middle English could have acquired a productive rule associating psych verbs with *admire*-type argument structure; indeed, *admire*-type verbs are not even in the majority. This appears at first sight to be a case in which a type of argument structure has been extended historically despite the lack of a productive rule.

In this section, we will focus on the eighteen psych verbs which, according to the data from the MED, can show either *amuse*-type or *admire*-type argument structure.⁶ These are shown in Table 7 along with the date of first attestation for each argument structure.

Some general trends are clear from the table. First, with only three exceptions, all such verbs also show subject-EXPERIENCERS in intransitive or reflexive constructions. Second, with the sole exception of *cherishen*, the earliest attested argument structure is either *amuse*-type or a subject-EXPERIENCER in an intransitive or reflexive construction, suggesting that *admire*-type argument structure generally develops later. In the case of *deliten* and *shamen*, the use of *admire*-type argument structure did not survive to the present day, but the descendants of *cherishen*, *envien*, *feren*, *liken*, *lothen*, *repenten*, and *savouren* are *admire*-type verbs in Present-Day English.

Nevertheless, a closer examination of the verbs in the table reveals subtle differences in the pattern of development. Basing ourselves on the extensive set of quotations given in the MED entries, we tentatively suggest three distinct groups of verbs. The first group consists of verbs where the emergence

⁶ Our list differs slightly from that of van Gelderen (2018: 147) since our definition of *admire*-type verbs is more restrictive, being limited to cases in which subject-EXPERIENCERS OCCUR with an object-STIMULUS and not simply in an intransitive or reflexive construction. For example, while *greven* and *merveillen* are attested with a subject-EXPERIENCER, we could find no evidence in the MED that they could occur with an object-STIMULUS.

Verb	Origin	<i>amuse</i> -type	<i>admire</i> -type	intr./refl. subject- EXPERIENCER
<i>agrisen</i>	nFBV	c1200 (2)	1382 (3a)	c1225 (1ab)
<i>auen</i>	nFBV	c1200 (1a)	1475 (1b)	—
<i>cherishen</i>	FBV	c1380 (5)	a1325 (1a)	—
<i>deliten</i>	FBV	1340 (3a)	c1450 (1b)	a1200 (1a)
<i>envien</i>	FBV	1400 (1b)	1393 (2b)	1382 (2c)
<i>feren</i>	nFBV	c1175 (1)	a1393 (2a)	a1393 (2a)
<i>forthinken</i>	nFBV	c1225 (3)	c1303 (1a)	a1225 (1b)
<i>grisen</i>	nFBV	a1349 (2)	a1325 (3a)	a1200 (1a)
<i>joien</i>	FBV	c1303 (4a)	c1450 (3a)	c1250 (4b)
<i>liken</i>	nFBV	c1175 (1aa)	a1200 (2a)	a1325 (1ac)
<i>lothen</i>	nFBV	c1175 (1a)	c1175 (3a)	a1382 (3b)
<i>misliken</i>	nFBV	c1175 (1a)	c1200 (1b)	c1225 (2a)
<i>ofthinken</i>	nFBV	c1175 (1a)	c1175 (2a)	c1175 (1a)
<i>repenten</i>	FBV	a1338 (1be)	a1338 (1ab)	c1300 (1aa)
<i>reuen</i>	nFBV	a1225 (1d)	c1175 (1a)	a1350 (1b)
<i>savouren</i>	FBV	a1250 (7a)	a1425 (7b)	—
<i>shamen</i>	nFBV	c1175 (3a)	c1384 (1ab)	c1150 (1aa)
<i>uggen</i>	nFBV	c1340 (1c)	1434 (2c)	c1400 (1a)

Table 7: First attestation of *amuse*-type, *admire*-type and intransitive or reflexive use of the subject-EXPERIENCER in the MED. MED definition number in parentheses.

of *admire*-type argument structure is a genuine case of the arguments in the personal transitive construction flipping from an earlier *amuse*-type structure. The second group consists of verbs for which *amuse*-type argument structure appears to be attested primarily with propositional STIMULI, with *admire*-type argument structure preferred for cases containing two nominal arguments. The final group contains verbs for which the roles of the EXPERIENCER and STIMULUS arguments are reversed by semantic change. We will treat each of these groups in turn.

The first group of verbs show flipping of argument structure in the personal transitive construction from *amuse*-type to *admire*-type, and the verbs

concerned are *deliten*, *feren*, *joien*, *liken*, *lothen*, and *misliken*. As discussed in section 2, *amuse*-type argument structure is older (e.g. 17a) than *admire*-type argument structure, which is first attested later (17b), as illustrated here with *feren* (example 6 repeated here as 17):

- (17) a. *He wile himm færenn ziff he maȝ*
 he will him frighten if he may
 ‘He wants to frighten him if he can.’
 (MED, c1175 Orm.(Jun 1), in van Gelderen 2018: 153)
- b. *Alle that company fere I ryth nouth.*
 all that company fear I right nothing
 ‘I do not fear that company at all.’
 (MED, ?a1475 Ludus C.(Vsp D.8))

Note that in the case of *liken*, *misliken* and *lothen*, the date of first attestation alone suggests that *admire*-type and *amuse*-type argument structure are first attested at a roughly similar time, but it is possible that these first attestations are outliers, with most citations with *admire*-type argument structure dating from the 14th century or later. With regard to *liken*, Allen (1986: 400) observes that nominative subjects are first attested in the 14th century, and indeed the majority of MED citations are from after 1300. However, all verbs also show other uses with a subject-EXPERIENCER, e.g. intransitive with a PP STIMULUS (18a, e), intransitive with no STIMULUS (18b), or reflexive with a PP STIMULUS, (18c, d):

- (18) a. *þou ne shalt nouȝt deliten in sacrifices.*
 you not shall not delight in sacrifices
 ‘You shall not take pleasure in sacrifices.’
 (MED, c1350 MPPsalter (Add 17376)50.17)
- b. *Thei, seeynge the sterre, ioyeden with a ful grete ioye.*
 they seeing the star rejoiced with a very great joy
 ‘They, seeing the star, rejoiced with very great joy.’
 (MED, (c1384) WBible(1) (Dc 369(2))Mat.2.10)
- c. [...] *That of the noise and of the soun Men feeren hem in al*
 that of the noise and of the sound men frighten them in all
the toun Welmore than thei don of thonder.
 the town wellmore than they do of thunder
 ‘[...] so that men in the entire town fear the noise and the sound
 [of the bell] much more than they do thunder.’
 (MED, a1393 Gower CA Frf 3 3.454)
- d. *He ssolde.. wexe ine god þet he ssolde habbe ine him ine huam*
 he should grow in god that he should have in him in whom

he him ssolde lykky.
 he REFL should please
 'He should prosper in God whom he should have in him, in
 whom he should take delight.'

(MED, (1340) Ayenb.(Arun 57)127/23)

- e. *Of hir life she gan to loothe.*
 of her life she began to loathe
 'She began to loathe her life.'

(MED, a1450 Gener.(1) (Mrg M 876)7718)

The SP analysis carried out in section 4 suggested that the use of a subject-EXPERIENCER in the psych verb class had become a productive rule of argument structure in the ME period. The fact that the structures such as (18) are attested alongside new *admire*-type constructions with an object-STIMULUS provides further support for this finding, as it suggests that learners are primarily extending the use of subject-EXPERIENCERS while the realization of the STIMULUS argument remains more variable. The flipping of verbs from *amuse*-type to *admire*-type would therefore appear to be a two-stage change: first, a variety of new structures are innovated with subject-EXPERIENCERS with the STIMULUS argument only subsequently becoming fixed in the object position. Furthermore, the fact that many copied French *amuse*-type verbs showed a reflexive alternation is likely to have favoured the expansion of subject-EXPERIENCERS in constructions other than *admire*-type structures with an object STIMULUS.

The second group of verbs to consider are those which are consistently found with subject-EXPERIENCERS but for which *amuse*-type argument structure is less robustly attested by the entries in the MED. This category includes (*a*)*grisen* and *joien*, two verbs which are predominantly cited in intransitive or impersonal constructions, and *forthinken*, *ofthinken*, *repenten* and *reuen*, where *admire*-type argument structure is more clearly attested. The use of subject-EXPERIENCERS both with (19a) and without (19b) an object-STIMULUS is shown below with the verb *forthinken*:

- (19) a. *He forthoghte hys synne & beleuede in oure lorde.*
 he repented his sin and believed in our lord
 'He repented his sin an believed in Our Lord.'

(MED, c1440 Bonav.Medit.(3) (Thrn)206)

- b. *Forthinke zee, or do zee penaunce.*
 repent REFL OR do you penance
 'Repent, or do penance'

(MED, (c1384) WBible(1) (Dc 369(2))Mark 1.15)

Regarding the possibility of *amuse*-type argument structure, despite occasional

cases of NP subject-STIMULI (20), the majority of citations involve a propositional STIMULUS, typically expressed by the pronouns *þat* (21a) or *it* (21b):

- (20) *Sore ofþinkeþ me þis cas, þat þou fiȝttes wiþ Nicholas.*
 badly displeases me this case that you fight with Nicholas
 ‘I am displeased by the fact that you are fighting with Nicholas.’
 (MED, c1400(?a1300) KALex.(LdMisc 622)1055)
- (21) a. *þe erth sore qwakyth and þat agresyþ me.*
 the earth sore quakes and that terrifies me
 ‘The earth trembles greatly and that terrifies me.’
 (MED, ?a1475 Ludus C.(Vsp D.8))
- b. *Hit forþinkes me sore þat we schul departe*
 it grieves me greatly that we should leave
 ‘It grieves me greatly that we have to leave.’
 (MED, a1375(1335-1361) WPal.(KC 13)5422)

In contrast to the first group, the verbs in this second group do not seem to show argument structure flipping from *amuse*-type to *admire*-type. Instead, the *amuse*-type structure is firmly associated with propositional rather than with NP STIMULI and elsewhere subject-EXPERIENCERS are already the norm in ME. Perhaps significantly, some of the examples cited of “*amuse*-type” argument structure in the MED involved a pre-verbal EXPERIENCER argument, giving rise to examples such as (22) which could equally be analysed as instances of the impersonal (see section 2):

- (22) *Petir stod an dred ful sor, Him forþoht þat he com þare.*
 Peter stood and dread very great him grieved that he came there
 ‘Peter stood and was fully afraid, it pained him that he came here.’
 (MED, a1325(?c1300) NPass.(Cmb Gg.1.1)654)

One possibility is that *amuse*-type argument structure in these verbs originates from the reanalysis of impersonals with a clausal STIMULUS, causing the EXPERIENCER argument to remain in the oblique case but to switch to being placed after the verb, as seen in (21) above.

The third and final group of verbs are those which show argument structure change as a result of idiosyncratic semantic factors. *Cherishen* is initially attested with *admire*-type argument structure and the meaning ‘to hold (sb.) dear, have affection for, treat with kindness’, before developing an *amuse*-type structure in the 15th century ‘to fill (sb.) with good cheer; entertain, delight, comfort’. Here the role of the STIMULUS and the EXPERIENCER has been reversed due to a metonymic change in the verb meaning: while the initial meaning

focuses on the psychological state of the ‘cherisher’, the extended meaning denotes the psychological state of the ‘cherishee’. No wider syntactic change is attested. In the case of *savouren*, the original, non-psych meaning of the verb is compatible either with a subject-EXPERIENCER, i.e. ‘to taste (sth.)’ or with a subject-STIMULUS ‘to have/give flavour or taste’, and these configurations are transferred into the psych domain as ‘to enjoy or relish’ (*admire*-type) and ‘to give pleasure to’ (*amuse*-type) respectively. As a consequence of this idiosyncratic semantic development, neither *cherishen* nor *savouren* are used intransitively or reflexively with a subject-EXPERIENCER. Finally, the *admire*-type meaning of *shamen* ‘to regard (someone) with awe or reverence’ is very different from the *amuse*-type and subject-EXPERIENCER meaning ‘to be ashamed’.⁷

While it is difficult to draw firm conclusions from such a cursory examination of the data, the productivity of subject-EXPERIENCERS, coupled with the introduction of verbs from French which show a reflexive alternation, appears to be an important factor driving argument structure change in ME psych verbs. In the first group of verbs, argument structure ‘flipping’ from *amuse*-type to *admire*-type passes through an intermediate phase in which a variety of argument structures involving subject-EXPERIENCERS are possible. In the second group of verbs, *amuse*-type argument structure is mainly restricted to propositional STIMULUS arguments, with subject-EXPERIENCERS used elsewhere. In both groups, subject-EXPERIENCERS are found not only in *admire*-type argument structure with an object-STIMULUS but also in intransitives and reflexive structures. The expansion of argument structures involving subject-EXPERIENCERS in ME is predicted by the results of the SP analysis in section 4, which indicates that learners would have acquired the use of a subject-EXPERIENCER as a productive rule of argument structure in the psych verb class. Although this rule does not directly favour the rise of *admire*-type argument structure with an object STIMULUS, we may speculate that an increase in frequency of subject-EXPERIENCERS in reflexive and intransitive constructions may have caused learners to innovate new structures with an object-STIMULUS, in particular if they rarely encountered the verb in *amuse*-type structures in the primary data. This hypothesis remains open for confirmation using data from a wider corpus.

⁷ To complete the discussion, there is little data from the MED with which to evaluate the development of *auen* and *uggen* and neither are attested in the M3 and M4 sections of the PPCME2, suggesting that they are rare. In the case of *envien*, only one citation in the MED shows *amuse*-type argument structure, and further work would be needed to evaluate whether or not this was widespread in ME.

6 CONCLUSIONS

The method used in the current paper sheds new light on well-documented changes in the argument structure of psych verbs in ME. Our data confirm that subject-EXPERIENCERS become more frequent in ME, and by applying the TP and SP to the class of psych verbs, we reconstruct that ME speakers learned the use of a subject-EXPERIENCER with a psych verb as a productive rule of argument structure (section 4.2). Crucially, subject-EXPERIENCERS were commonly used in intransitive or reflexive constructions even for verbs which show *amuse*-type argument structure (i.e. an object-EXPERIENCER) in personal transitive constructions. While the ‘flipping’ of verbs such as *feren* from *amuse*-type to *admire*-type does not appear to have resulted directly from a productive rule of argument structure — indeed, *admire*-type verbs are never in the majority in ME — we argued that the use of subject-EXPERIENCERS was productive regardless of the realization of the STIMULUS argument, and this may ultimately have caused *admire*-type argument structure with an object-STIMULUS to have been extended (section 5).

The use of subject-EXPERIENCERS in intransitive and reflexive constructions was probably strengthened by language contact with OF. We showed that the argument structure of the OF psych verbs copied into English closely resembles that of ME psych verbs, with widespread use of subject-EXPERIENCERS (section 4.3). Moreover, French *amuse*-type psych verbs regularly show a reflexive or intransitive use with a subject-EXPERIENCER, a pattern which can also be found for the ME copies. While our data are not sufficient to suggest that the copied OF verbs alone were sufficient to trigger changes in ME argument structure, it is probable that contact influence accelerated the spread of subject-EXPERIENCERS already taking place in English.

From a methodological point of view, we have shown that Yang’s (2016) TP and SP provide a vital addition to the historical linguist’s toolbox for the quantitative analysis of corpus data. It provides a principled answer to the question “when is there sufficient positive evidence to posit a rule?” when attempting to reconstruct productive rules at past stages of the history of a language, which in turn allows us to identify changes in the language which may have been triggered by the elimination of exceptions to this productive rule (e.g. the spread of subject EXPERIENCERS). We identified three core problems inherent in applying the TP to historical analysis: the problem of defining the class to be investigated and determining how many lexical items it contains (the CLASS SIZE PROBLEM), the problem of identifying which forms are grammatical for each lexical item without access to the mature grammar of a native speaker (the ATTESTATION PROBLEM), and the problem of using historical texts to approximate the input to an historical child learner (the DATA

COMPATIBILITY PROBLEM) (section 3.3). Combining corpus data, lexicographical resources and the technique of ‘frequency trimming’ of the lexicon advocated by Kodner (2019), we have attempted to address these problems as best we can. In particular, it is encouraging that the results of our analyses in section 6 are consistent across all class sizes and more encouraging still that the productivity of subject-EXPERIENCERS is most clearly attested for the smallest class size, which is a more plausible model of a speaker’s vocabulary than a list of all the psych verbs in the MED. Nevertheless, we wish to stress that results of TP and SP analyses on historical data must always be interpreted with great care, especially if the results are near the tolerance threshold. If it is true that the TP “lives and dies by the number” (Yang 2016: 70), in historical work this absolute view must be qualified by the observation that the numbers themselves are just best estimates based on data from written texts. Interpretation of the results should therefore always take into account the likely margin of error.

The purpose of the TP and the SP is to model the acquisition of productive rules of grammar based on the primary linguistic data to which child learners are exposed. When applied diachronically, the TP and SP can help to reveal which productive rules are likely to have been active in the past and which structures are likely to have spread through the grammar. In our view, this forms an important complement to other explanations of language change, which may focus on the innovation triggering the change, such as the loss of oblique case marking on EXPERIENCER subjects (cf. Allen 1995) or changes in the expression of causativity (van Gelderen 2018).

APPENDIX

Table 8 lists the 146 psych verbs examined in section 4. Verbs marked with an asterisk were not attested in section M3 or M4 of the PPCME2. The ‘origin’ column distinguishes verbs copied from French (FBV) from native and other verbs (nFBV). Table 9 lists the 53 French psych verbs copied into ME (see section 4.3).

ME psych verb	Origin	Meaning
<i>abaishen</i>	FBV	‘to lose one’s composure, become upset’
<i>acoien*</i>	FBV	‘to soothe’
<i>acombren</i>	FBV	‘to burden’
<i>adouren</i>	FBV	‘to adore’
<i>agasten</i>	nFBV	‘to frighten, to become frightened’
<i>affraien*</i>	FBV	‘to harrass, to be afraid’
<i>affien</i>	FBV	‘to trust’

Tolerating subject-EXPERIENCERS

ME psych verb	Origin	Meaning
<i>agreven</i>	FBV	'to disturb, trouble, harass'
<i>agrisen</i>	nFBV	'to be/make frightened'
<i>amaien*</i>	FBV	'to frighten'
<i>angren</i>	nFBV	'to anger, to become angry'
<i>anoien</i>	FBV	'to annoy'
<i>apaien</i>	FBV	'to satisfy, please'
<i>apesen</i>	FBV	'to reconcile, to grow calm'
<i>arghen*</i>	nFBV	'to intimidate, to be timid'
<i>arwurden*</i>	nFBV	'to respect'
<i>asswagen</i>	FBV	'to assuage, placate'
<i>auen*</i>	nFBV	'to terrify'
<i>belwen*</i>	nFBV	'to become angry'
<i>biloven</i>	nFBV	'to be inclined'
<i>bimenen*</i>	nFBV	'to deplore'
<i>blissen</i>	nFBV	'to be/make glad'
<i>blithen*</i>	nFBV	'to be/make happy'
<i>bolden</i>	nFBV	'to be/make bold'
<i>caren</i>	nFBV	'to grieve, be sad'
<i>cheren</i>	nFBV	'to console'
<i>cherishen</i>	FBV	'to cherish'
<i>comforten</i>	FBV	'to comfort, strengthen spiritually'
<i>deliten</i>	FBV	'to be/make delighted'
<i>derfen*</i>	nFBV	'to harrass'
<i>despisen</i>	FBV	'to despise'
<i>despeiren</i>	FBV	'to despair'
<i>discomforten</i>	FBV	'to discomfort'
<i>disdeinen*</i>	FBV	'to disdain'
<i>disesen</i>	FBV	'to put to material discomfort, to distress'
<i>dismaien</i>	FBV	'to be/make dismayed'
<i>displesen</i>	FBV	'to be/make displeased'
<i>distourben</i>	FBV	'to frighten'
<i>dolen*</i>	FBV	'to suffer'
<i>douten</i>	FBV	'to doubt'
<i>drecchen</i>	nFBV	'to oppress'
<i>dreden</i>	nFBV	'to dread'
<i>egren</i>	FBV	'to excite'
<i>enchaunten*</i>	FBV	'to enchant'
<i>endeinen*</i>	FBV	'to take offence'
<i>enduren</i>	FBV	'to harden, tolerate, endure'

ME psych verb	Origin	Meaning
<i>enjoien</i>	FBV	'to rejoice'
<i>enspiren</i>	FBV	'to blow, waft, inspire'
<i>enticen</i>	FBV	'to incite, tempt'
<i>envien</i>	FBV	'to envy'
<i>fainen*</i>	nFBV	'to be/make happy'
<i>feren</i>	nFBV	'to frighten'
<i>forthinken</i>	nFBV	'to regret, repent'
<i>freten</i>	nFBV	'to devour, to vex'
<i>freoren*</i>	nFBV	'to comfort'
<i>frighten*</i>	nFBV	'to frighten'
<i>gamen*</i>	nFBV	'to be/make merry'
<i>gasten*</i>	nFBV	'to frighten'
<i>gladen</i>	nFBV	'to be/make glad'
<i>gramen*</i>	nFBV	'to make angry'
<i>gremen*</i>	nFBV	'to make angry'
<i>greven</i>	FBV	'to injure, to make angry'
<i>grillen*</i>	nFBV	'to offend, anger'
<i>grisen*</i>	nFBV	'to shudder, quake, feel horror'
<i>harmen</i>	nFBV	'to injure'
<i>haten</i>	nFBV	'to hate'
<i>herten</i>	nFBV	'to encourage'
<i>hevien</i>	nFBV	'to make heavy, grieve, sadden'
<i>ihvien*</i>	nFBV	'to afflict, suffer'
<i>irken</i>	nFBV	'to be/make weary'
<i>iswenchen*</i>	nFBV	'to harrass'
<i>iwrethen*</i>	nFBV	'to be/make angry'
<i>joien</i>	FBV	'to feel gladness or pleasure'
<i>liken</i>	nFBV	'to like, please'
<i>lipnen*</i>	nFBV	'to trust'
<i>liten</i>	FBV	'to delight'
<i>lothen</i>	nFBV	'to be hateful'
<i>loven</i>	nFBV	'to love'
<i>lusten</i>	nFBV	'to desire, wish'
<i>madden</i>	nFBV	'to be/make mad'
<i>maien*</i>	FBV	'to be frightened'
<i>masen</i>	nFBV	'to be/make confused'
<i>merveillen</i>	FBV	'to be filled with wonder'
<i>meven</i>	FBV	'to move, arouse, excite'
<i>mirthen*</i>	nFBV	'to amuse'

Tolerating subject-EXPERIENCERS

ME psych verb	Origin	Meaning
<i>misleden</i>	nFBV	'to mislead'
<i>misliken</i>	nFBV	'to displease/dislike'
<i>mispaien*</i>	FBV	'to displease'
<i>misplesen*</i>	FBV	'to displease'
<i>mistresten*</i>	nFBV	'to mistrust'
<i>mistrouen*</i>	nFBV	'to disbelieve'
<i>mornen</i>	nFBV	'to grieve, sorrow'
<i>netheren*</i>	nFBV	'to humiliate'
<i>noien</i>	FBV	'to harm, injure, to distress'
<i>ofdreden*</i>	nFBV	'to fear'
<i>offenden</i>	FBV	'to displease, offend'
<i>ofthinken*</i>	nFBV	'anger, grieve, regret'
<i>overhouen*</i>	nFBV	'to despise'
<i>overtrouen*</i>	nFBV	'to mistrust'
<i>paien</i>	FBV	'to please'
<i>peinen</i>	FBV	'to punish, suffer sorrow'
<i>perturben*</i>	FBV	'to disturb, disquiet'
<i>plesen</i>	FBV	'to please'
<i>prisen*</i>	FBV	'to esteem'
<i>provoken*</i>	FBV	'to seek forgiveness, to anger'
<i>quemen*</i>	nFBV	'to please'
<i>ragen*</i>	FBV	'to be furious'
<i>recomforten</i>	FBV	'to comfort, encourage'
<i>regreten*</i>	FBV	'to express sorrow'
<i>rejoicen</i>	FBV	'to give/take pleasure'
<i>remorden</i>	FBV	'to cause/feel remorse'
<i>repenten</i>	FBV	'to feel regret'
<i>reuen</i>	nFBV	'to regret'
<i>reusen*</i>	nFBV	'to feel sorrow'
<i>savouren</i>	FBV	'to give pleasure, relish'
<i>shamen</i>	nFBV	'to be ashamed'
<i>skerren*</i>	nFBV	'to scare'
<i>smerten</i>	nFBV	'to cause pain, cause to suffer grief'
<i>solasen</i>	FBV	'to entertain, amuse'
<i>sorwen</i>	nFBV	'to feel sorrow'
<i>sotten*</i>	FBV	'to be stupid'
<i>souen</i>	nFBV	'to cause to feel sorrow'
<i>stonen</i>	FBV	'to be/make astonished'
<i>stourben</i>	FBV	'to disturb'

ME psych verb	Origin	Meaning
<i>sufferen</i>	FBV	'to suffer'
<i>supporten</i>	FBV	'to aid, to be forbearing'
<i>swenchen*</i>	nFBV	'to afflict, suffer'
<i>tarien</i>	FBV	'to vex'
<i>tenen*</i>	nFBV	'to be/make angry'
<i>terren</i>	nFBV	'to vex'
<i>tormenten</i>	FBV	'to torture, distress'
<i>touchen</i>	FBV	'to touch, to affect'
<i>traisten</i>	nFBV	'to trust'
<i>treien</i>	nFBV	'to annoy'
<i>tribulen*</i>	FBV	'to disturb'
<i>troublen</i>	FBV	'to be/make troubled'
<i>trusten</i>	nFBV	'to be confident'
<i>tweonen*</i>	nFBV	'to doubt'
<i>uggen*</i>	nFBV	'to be fearful'
<i>wlaten</i>	nFBV	'to feel disgust'
<i>wondren</i>	nFBV	'to be awestruck'
<i>woren*</i>	nFBV	'to confuse'
<i>worshipen</i>	nFBV	'to esteem, respect'
<i>wratthen</i>	nFBV	'to be/make angry'
<i>wrethen*</i>	nFBV	'to be/make angry'
<i>wrixlen*</i>	nFBV	'to confuse'

Table 8: Middle English psych verbs

Tolerating subject-EXPERIENCERS

OF psych verbs	Meaning	ME
<i>afier</i>	'to trust'	<i>affien</i>
<i>agrever</i>	'to overwhelm'	<i>agreven</i>
<i>aigrier</i>	'to excite'	<i>egren</i>
<i>aorer</i>	'to adore'	<i>adouren</i>
<i>apaiier</i>	'to placate, appease'	<i>apaien</i>
<i>aqueer</i>	'to calm, soothe'	<i>acoien</i>
<i>assoagier</i>	'to assuage, placate'	<i>asswagen</i>
<i>chierir</i>	'to cherish, hold dear'	<i>cherishen</i>
<i>conforter</i>	'to comfort'	<i>comforten</i>
<i>delitier</i>	'to delight'	<i>deliten/liten</i>
<i>desaisier</i>	'to discomfort'	<i>disen</i>
<i>desconforter</i>	'to discomfort'	<i>discomforten</i>
<i>desdeignier</i>	'to reject, despise'	<i>disdeinen</i>
<i>desperer</i>	'to despair'	<i>despeiren</i>
<i>despire</i>	'to despise'	<i>despisen</i>
<i>desplaire</i>	'to displease'	<i>displezen</i>
<i>destorber</i>	'to disturb, obstruct'	<i>distourben</i>
<i>doloir</i>	'to suffer'	<i>dolen</i>
<i>douter</i>	'to doubt'	<i>douten</i>
<i>enchanter</i>	'to enchant'	<i>enchaunten</i>
<i>encombrer</i>	'to burden'	<i>acombren</i>
<i>endurer</i>	'to endure, forbear'	<i>enduren</i>
<i>enoier</i>	'to be abhorrent'	<i>(a)noien</i>
<i>enticier</i>	'to incite, goad'	<i>enticen</i>
<i>esbäir</i>	'to be stunned, astonished'	<i>abaishen</i>
<i>esfrëer</i>	'to harrass, to be afraid'	<i>affraien</i>
<i>esjör</i>	'to be joyful'	<i>enjoien</i>
<i>esmaiier</i>	'to be/make frighten'	<i>(a)maiien</i>
<i>grever</i>	'to aggrieve, burden'	<i>(a)greven</i>
<i>jöir</i>	'to be happy'	<i>joien</i>
<i>merveiller</i>	'to marvel, be filled with wonder'	<i>merveillen</i>
<i>mespaiier</i>	'to be disapproving'	<i>mispaiien</i>
<i>moveoir</i>	'to move; to agitate, arouse'	<i>meven</i>
<i>ofendre</i>	'to attack, hurt'	<i>offenden</i>
<i>paiier</i>	'to satisfy'	<i>paiien</i>
<i>perturber</i>	'to perturb, confuse'	<i>perturben</i>
<i>plaire</i>	'to please'	<i>plesen</i>
<i>prisier</i>	'to esteem'	<i>prisen</i>
<i>provochier</i>	'to challenge, defy'	<i>provoken</i>

OF psych verbs	Meaning	ME
<i>ragier</i>	'to become angry'	<i>ragen</i>
<i>reconforter</i>	'to comfort, encourage'	<i>recomforten</i>
<i>regreter</i>	'to lament'	<i>regreten</i>
<i>repentir</i>	'to regret, repent'	<i>repenten</i>
<i>resjöir</i>	'to give/take pleasure'	<i>rejoisen</i>
<i>sofrir</i>	'to suffer, tolerate'	<i>sufferen</i>
<i>solacier</i>	'to console, comfort'	<i>solasen</i>
<i>suporter</i>	'to bear, endure'	<i>supporten</i>
<i>tariier</i>	'to vex'	<i>tarien</i>
<i>torbler</i>	'to be/make troubled'	<i>troublen</i>
<i>tormenter</i>	'to torture, lament'	<i>tormenten</i>
<i>triboler</i>	'to trouble, agitate'	<i>tribulen</i>

Table 9: Old French psych verbs and their Middle English equivalents

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