

BINARY CORRELATIONS OF MIDDLE ENGLISH ONE-ROOT  
DEVERBAL COINAGES IN THE *OED* TEXTUAL PROTOTYPES

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ABSTRACT

The rise and consolidation of paradigmatic relations in the deverbal lexicon can be more fully traced by considering the first attestations of these coinages and their parent verbs. The paper presents the results of a study of one-root deverbal pairs on the basis of especially developed software applicable to the Middle English database extracted from the entire Oxford English Dictionary (*OED*). It sheds light on such less studied issues as the internal stratification of Middle English derivation, stochastic attraction of deverbal categories and the speed of the word-forming processes, suggesting new means of visualization modelling.

1. Preliminary remarks

A study of the word forming potential of lexemes over time is of interest for the reconstruction of the role played by the derivational categories at different stages of the history of the word-stock. Multiplicity of deverbal derivation is concerned with the participation of the verb in the creation of at least two derivatives. Depending upon the succession with which one-root deverbal coinages are registered in the written sources, their paradigmaticization trends can be revealed.

Learning more about the precedence strategies in one-root derivatives will enable us better to understand the path taken by the lexicon in order to actualize the word-forming potential of parent verbs.

2. Source of evidence

The tracing of the development of the lexicon over time envisages as a source of evidence the text samples in which the lexical items that are of interest for the research occur for the first time. Precedent texts known in corpus linguistics as

diachronic textual prototypes of lexemes reflect the fact that a word in question entered the written medium of the language. It is the earliest attestation of a word within the compiled corpus of evidence. In this study we have used the datings of verbs and their coinages as they are given in the 2<sup>nd</sup> electronic edition of the *Oxford English Dictionary* on CD-ROM, version 3. The criterion for a verb or a deverbative to be included into the corpus is the location of its earliest citation within the time span from 1150 to 1500.

### 3. Categorization and notational conventions

The corpus approach in historical lexicology envisages specified characteristics tagged to lexical items in the electronically accessible format (cf. Mair 2004, McArthur 1992). Deverbal coinages are tagged with the date of their earliest occurrence and an ordinal number given in brackets after them. These numbers stand for the action noun (1), action noun admitting its own factitive and/or resultative lexicalization(s) (2), agent noun (3), patient noun (4), deverbal adjective (5), present participle (6), passive modal adjective (7), and past participle (8): *multiply* 1275, *multiplying* 1380 (1), *multiplication* 1384 (2) *multiplier* 1420 (3), *multitipliant* 1430 (5), *multiplying* 1425 (6), *multiplicable* 1471 (7), *multiplied* 1463 (8). Secondary derivatives from adjectives and participles are tagged with the ordinal numbers from 9 to 16: *blamefully* 1400 (9), *blamefulness* 1400 (10), *sighingly* 1402 (11), *sighingness*\* 1300 (12), *notably* 1380 (13), *notability* 1380 (14) *advisedly* 1375 (15), *advisedness* 1400 (16). Factitive and/or resultative nouns conclude the list under number 17 on the ground that they are predominantly one-word counterparts of action nouns: *multiplication*<sub>1</sub> 1384 [The act or process of multiplying, or increasing the quantity or amount of ...] (2) vs. *multiplication*<sub>2</sub> [the state of being multiplied or increased] 1384 (17). This demonstrates epidigmatic derivation. Such coinages arose on the basis of a separate suffixal model of deverbal nominalization quite rarely. The asterisk attached to the word on its right-hand side signals that the respective lexeme attested in ME is labelled by the *OED* as now archaic. Consequently, in a one-root exemplification all, some or none of the Middle English lexemes may be in use now: e.g. *-reduce* 1374, *reducing* 1488 (1), *reducible* 1450 (7); *semble*\* 1300, *sembling*\* 1440 (1), *semblable* 1374 (7); *remue*\* 1297, *remuing*\* 1399 (1), *remuable*\* 1374 (7).

All the analyzed coinages were specifically checked for their being motivated by the verb. In cases of homonymy as of *hope* (n) and *hope* (v) the derivatives that are in our corpus are verified deverbal coinages: *blame* 1200, *blaming* 1382 (1), *blamer* 1387 (3), *blameful* 1386 (5), *blameable* 1387 (7), *blamefully* 1400 (9), *blamefulness* 1400 (10).

On the basis of the developed software a search through the collected corpus provides us with the lexemic manifestation of a given categorial pattern over time. In this contribution we will dwell on one-root pairs of deverbal derivatives.

### 4. Creating a computerized framework

Each one-root deverbal word-forming family has been entered into a lattice. The slots in the latter are reserved for the verb itself as well as its actualized derivatives. A date tag to each of the filled in positions is attached. When there is synonymy of suffixal models within the category, the oldest coinage has been entered into the slot, and when there are two coinages from the same year the more productive model has been taken into account.

The described inventory lattice is supplemented by the combinatorial one. The latter makes it possible to carry out combinability searches of the verb and deverbal category/categories whose first attestation(s) are limited by the chosen date(s). This search can be implemented in two alternative modes: by inclusive (arbitrary) combinations of categories irrespective of whether or not any other one-root coinage(s) of additional categorial affiliation occur(s) and by exclusive (paradigmatic) sets of categories when the revealed combinatorics, which is valid for the given period, has no one-root deverbatives of other categories in that period. To show the temporal heterogeneity of constituents within a set of categories their arbitrary chronological stratification is envisaged in a separate sub-lattice. The outcome of such a search lies in establishing the extent of diachronic continuity within pairs of deverbal categories or their larger groupings as arising constituents join the existing ones.

### 5. Middle English deverbatives with and without Middle English verbs

The *OED*-based Middle English corpus yields 5,565 filled-in slots in the lattice, 4,303 of which contain a verb attested for the first time in Middle English text records. However, 1,476 Middle English verbs are characterized by word-forming sterility in Middle English. The number of verbs that are related to Middle English attested coinages thus amounts to 2,827 lexemes. The number of coinages corresponding to these verbs reaches 4,783 lexemes. Besides this, 2,675 deverbatives are attested for the first time in Middle English but the diachronic textual prototypes of their verbs are dated outside this period.

Some categories of deverbalization reveal a fairly even proportion between the coinages whose verbal base was or was not attested in Middle English whereas others do not. For instance, as many as about one half of Middle English action nouns admitting no factitive lexicalization had no one-root verbs attested in Middle English. In contrast, among present participles every third coinage in Middle English existed without the respective verb, whereas among past participles it was only every fifth derivative (Table 1). The fact that action nouns existed without the verb oftener than participles is apparent. But the difference between the participles themselves is more difficult to explain.

Secondary deverbatives had an additional source of implicit motivation. Not only could the parent verb be unattested in Middle English, but also the one-root adjective or participle. Cases with the attested Middle English verb reveal 37 secondary deverbatives that lack their motivating base in the form of the adjective or participle in Middle English. With the unattested Middle English verb the number of secondary deverbatives lacking their immediate motivating base is twice as high (76 cases). Yet nouns coined from past participles failed to provide us with a single example of either kind of motivating deficiency.

Table 1. Categories of deverbalization in the *OED* Middle English textual prototypes

Deverbal category	Explicitness of motivational relations					
	Verb attested in ME		Verb unattested in ME		Total	
Action nouns (d <sub>1</sub> )	694	54.42%	886	45.58%	1,944	100%
Lexicalized action nouns (d <sub>2</sub> )	694	62.58%	415	37.42%	1,109	100%
Agent nouns (d <sub>3</sub> )	743	65.12%	398	34.88%	1,141	100%
Patient nouns (d <sub>4</sub> )	15	75%	5	25%	20	100%
Adjectives (d <sub>5</sub> )	144	64%	81	36%	225	100%
Present participles (d <sub>6</sub> )	391	66.72%	195	33.28%	586	100%
Passive modal adjectives (d <sub>7</sub> )	173	66.54%	87	33.46%	260	100%
Past participles (d <sub>8</sub> )	776	78.70%	210	21.3%	986	100%
Factitive nouns (d <sub>17</sub> )	628	66.79%	314	33.3%	943	100%
Secondary deverbatives (d <sub>9,16</sub> )	160	66.94%	79	33.05%		100%

#### 6. Combinatorial attraction of deverbal categories from Middle English verbs.

Since Middle English present participles and passive modal adjectives never combined with patient nouns out of thirty-six potential binary combinations of one-root derivatives thirty-four actually occurred: *command* 1300 *commandment* (1), *commanding* 1300 (2); *wimple* 1240, *wimpling* 1240 (1), *wimpler* 1260 (3); *present* 1290, *presentment* 1303 (1), *presentee* 1498 (4) *repent* 1290, *repenting* 1300 (1), *repentant* 1290 (5); *chatter* 1225, *chattering* 1250 (1), *chattering* 1225 (6); *reduce* 1374, *reducing* 1488 (1), *reducible* 1450 (7) *manse*\* 1200, *mansing*\* 1290 (1), *mansed* 1275 (8); *command* 1300, *commandment* 1250 (1), *commanding* 1300 (17); *plead* 1250, *pleading* 1297 (2), *pleader* 1275 (3); *present*

1290, *presentation* 1380 (2), *presentee* 1498 (4); *concord* 1374, *concordance* 1450 (2), *concordant* 1477 (5); *sob* 1200, *sobbing* 1300 (2), *sobbing* 1200 (6); *deform* 1400, *deformation* 1440 (2), *deformable* 1450 (7); *save* 1225, *saving* 1300 (2), *saved* 1300 (8); *waste* 1205, *wasting* 1300 (2), *wasting* 1300 (17); *feoff* 1290, *feoffer* 1440 (3), *feoffee* 1411 (4); *surmount* 1369, *surmounter* 1500 (3), *surmontant*\* 1400 (5); *fickle*\* 1225, *fickler* 1225 (3), *fickling* 1225 (6); *reprove* 1303, *reprover* 1422 (3), *reprovable* 1340 (7); *save* 1225, *saver* 1300 (3), *saved* 1300 (8), *disturb* 1225 *disturber* 1290 (3), *disturbance* 1297 (17); *present* 1290, *presentee* 1498 (4), *presentative* 1430 (5); *assign* 1297, *assignee* 1419 (4), *assigned* 1374 (8); *ordain* 1290, *ordinee* 1330 (4), *ordainment* 1399 (17); *ply* 1375, *pliant* 1382 (5), *plying* 1399 (6); *persevere* 1374, *perseverant* 1413 (5), *perseverable*\* 1450 (7); *please* 1325, *pleasant* 1375 (5), *pleased* 1382 (8); *-cord*\* 1300, *cordant*\* 1300 (5), *cording*\* 1300 (17); *warray*\* 1300, *warraying* 1300 (6), *warrayable* 1499 (7); *ridel*\* 1499, *rideling*\* 1399 (6), *rideled*\* 1366 (8); *sob* 1200, *sobbing* 1200 (6), *sobbing* 1300 (17), *return* 1366, *returnable* 1425 (7), *returned* 1425 (8); *purvey* 1290, *purveyable* 1374 (7), *purveyance* 1297 (17); *paint* 1250, *painted* 1300 (8), *painting* 1225 (17). Pairs of deverbatives were characterized by varied productivity (see the lower triangle of Matrix 1). There were also certain differences as regards the specific time within Middle English when they arose as well as the temporal lag between the attestations of correlating one-root constituents and their accumulation over time.

Groupings of one-root derivatives with more than two members provide us with the respective number of deverbal pairs: e.g. *purvey* 1290, *purveying* 1374 (1), *purveyance* 1300 (2), *purveyor* 1300 (3), *purveyant*\* 1422 (5), *purveyable* 1374 (7), *purveyed* 1390 (8), *purveyance* 1297 (17); *purveying* 1374 (1), *purveyance* 1300 (2); *purveying* 1374 (1), *purveyor* 1300 (3); *purveying* 1374 (1), *purveyant*\* 1422 (5); *purveying* 1374 (1), *purveyable* 1374 (7); *purveying* 1374 (1), *purveyed* 1390 (8); *purveying* 1374 (1), *purveyance* 1297 (17); *purveyance* 1300 (2), *purveyor* 1300 (3); *purveyance* 1300 (2), *purveyant*\* 1422 (5); *purveyance* 1300 (2), *purveyable* 1374 (7); *purveyance* 1300 (2), *purveyed* 1390 (8); *purveyance* 1300 (2), *purveyance* 1297 (17); *purveyor* 1300 (3), *purveyant*\* 1422 (5); *purveyor* 1300 (3), *purveyable* 1374 (7); *purveyor* 1300 (3), *purveyed* 1390 (8); *purveyor* 1300 (3), *purveyance* 1297 (17); *purveyant*\* 1422 (5), *purveyable* 1374 (7); *purveyant*\* 1422 (5), *purveyed* 1390 (8); *purveyant*\* 1422 (5), *purveyance* 1297 (17); *purveyable* 1374 (7), *purveyed* 1390 (8), *purveyable* 1374 (7), *purveyance* 1297 (17); *purveyed* 1390 (8), *purveyance* 1297 (17).

A pair of deverbatives might constitute a two-member paradigm in Middle English. In that case the respective verb had no other coinages attested in the set period (see the upper triangle of Matrix 1). However, a number of the attested pairs might have other one-root derivatives. The figures in the upper triangle of

Matrix 1 are included into those in its lower triangle where the overall productivity of deverbal pairs is represented.

The proportion between the respective squares in the triangles of Matrix 1 is at times interestingly uneven. For instance, almost forty per cent of all the attested one-root past participles and action nouns did not correlate with any other derivatives in Middle English. At the same time, exclusive one-root combinations of the past participles and agent nouns slightly exceeded 10% of their entire count.

The number of cases in which two one-root deverbatives get combined constitutes a varied share in the word-forming productivity of each of the categories. This quota is an instrument of measuring the probability of the deverbal types' mutual occurrence. It is the basis for the stochastic statements to the effect that if there is a specific category of the deverbative in a word-forming family, then in a proportion of families there is also the same root derivative of the compared category. On the basis of Matrix 1 it is possible to carry out a calculus of the said attraction for coinages with attested Middle English verbs measured in per cent (Matrix 2).

The calculated bilateral attraction is mostly uneven owing to the varied word-forming productivity of the compared categories. For example, one in two of the passive modal adjectives gets combined with the same root action noun, whereas only every tenth of the passive modal adjective co-occurs with a factitive noun. Some of the estimates of bilateral attraction are obvious. This may be explained by a semantic reason, as in the case of action nouns and their factitive lexicalizations, or when the categories are marked by disproportionate word-forming productivity, e.g. agent nouns and patient nouns. More interestingly, though, there are cases when the degree of attraction is less predictable. For instance, passive modal adjectives get combined with non-lexicalized action nouns in every second case. Their combining with the present participle occurs in every third case, and that with the factitive noun in every tenth case. Yet factitive nouns are almost three times more productive than the present participle; that is why proceeding from the grounds of proportionality the latter two correlations should be inverted.

Though secondary deverbal derivation in Middle English was attested rather seldom its productivity from past participle and passive modal adjectives exceeded that from present participle and deverbal adjective: *advise* 1297, *advised* 1325 (8), *advisedly* 1375 (15), *advisedness* 1400 (16); *note* 1225, *notable* 1340 (7), *notably* 1380 (13), *notability* 1380 (14); *daze* 1325, *dazed* 1325 (8), *dazedly* 1300 (15), *dazedness* 1340 (16); *blame* 1200, *blameful* 1386 (5), *blamefully* 1400 (9), *blamefulness* 1400 (10); *sigh* 1300, *sighing* 1440 (6), *sighingly* 1402 (11), *sighingness*\* 1300 (12) There were pairs of secondary deverbatives that never got combined in Middle English.

Matrix 1. Pairs of derivatives from Middle English verbs in Middle English (lower triangle: total productivity; upper triangle: paradigmatic productivity)

One-root coinages	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>	D <sub>8</sub>	D <sub>17</sub>
D <sub>1</sub>		11	154	1	4	81	9	105	8
D <sub>2</sub>	119		23	0	3	6	0	25	154
D <sub>3</sub>	390	210		0	1	10	1	23	11
D <sub>4</sub>	5	7	6		0	0	0	0	4
D <sub>5</sub>	56	70	56	2		6	1	1	3
D <sub>6</sub>	207	92	135	0	37		1	8	3
D <sub>7</sub>	87	72	78	0	31	42		1	0
D <sub>8</sub>	258	214	180	5	26	88	72		14
D <sub>17</sub>	115	469	183	4	59	77	71	179	

Matrix 2. Combinatorial attraction of one-root Middle English deverbatives from Middle English (in %)

D ⊂ d <sub>n</sub>	⊂ d <sub>1</sub>	⊂ d <sub>2</sub>	⊂ d <sub>3</sub>	⊂ d <sub>4</sub>	⊂ d <sub>5</sub>	⊂ d <sub>6</sub>	⊂ d <sub>7</sub>	⊂ d <sub>8</sub>	⊂ d <sub>17</sub>
D <sub>1c</sub>		7.80	25.71	0.03	3.69	13.64	5.73	17.01	7.58
D <sub>2c</sub>	17.52		21.00	1.03	8.84	23.52	10.60	31.50	69.01
D <sub>3c</sub>	52.56	28.30		0.81	7.55	18.19	10.51	24.25	24.66
D <sub>4c</sub>	33.33	46.67	40.00		14.28	0.00	0.00	33.33	26.67
D <sub>5c</sub>	38.81	41.67	38.89	1.39		25.69	21.52	18.05	40.97
D <sub>6c</sub>	52.94	13.51	34.52	0.00	9.46		6.90	25.51	19.69
D <sub>7c</sub>	50.58	10.60	45.35	0.00	18.02	29.58		41.86	9.14
D <sub>8c</sub>	33.20	27.54	23.17	0.64	3.35	11.32	9.27		23.03
D <sub>17c</sub>	18.73	78.01	29.80	0.65	9.61	12.54	11.56	29.15	

## 7. A corpus of Middle English verbs and deverbatives diachronic stratification

Depending upon the chronological stratification, one-root deverbatives and their parent verbs fall under two major groupings: chronologically homogeneous and chronologically heterogeneous. Proceeding from the periodization of Middle English into Early Middle English (EME, 1150-1330) and Late Middle English (LME, 1301-1450) borrowed from Fisiak (1968) we found that 10% of the earliest quotations of our samples in the *OED* came from EME, whereas 70% occurred in the Late English Early sources. The concluding fifty years of 1451-1500 mark a transition from Middle English to Early New English (ENE) (Fisiak 1968). They are responsible for the remaining 20% of the first attestations, showing a drop in the word-forming productivity as compared with the years 1401-1450 and especially 1351-1400 in all the categories but passive modal adjectives and factitive nouns, the said drop testifying to the decline of

Middle English. The fact that these two categories of one-root deverbatives are "late" is quite predictable as passive modal adjectives were formed on the basis of a borrowed suffixal model and factitive nouns are by and large epigrammatic derivatives of action nouns.

#### 8. A calculus of diachronic paths and inventory generalizations

The earliest attestations of a verb and a pair of its coinages can have either a single or a multiple reference to the synchronic layers of Middle English determining their chronological homogeneity and heterogeneity. In the case of chronological homogeneity, the textual prototypes are attested within one synchronic layer. In the case of heterogeneity the chronological affiliation of one and the other two or all three textual prototypes differs. A diachronic path is a succession of textual attestations of the verb and deverbatives over time. When the deverbatives are chronologically heterogeneous there are two alternating diachronic paths in the chronological affiliation pattern of the verbs with two deverbal categories. That is why the number of diachronic paths exceeds the number of chronological affiliation patterns.

The heterogeneity of textual prototypes of the chronologically primary verb and its two derivatives usually rests on the word-forming sterility of the verb in the period when it was attested and its subsequent participation in the derivation of two deverbatives (1393 pairs). To a somewhat lesser extent (956 pairs) it was also caused by period homogeneity of the verb and one of the derivatives that are complemented by the other coinage in the subsequent sub-period (see also Table 2).

Early Middle English claims just about one third of the entire number of Middle English verbs. Yet they motivate three out of every four pairs of deverbal derivatives in the chronologically heterogeneous relationships. Here, the complementing derivative can be attested either in Late Middle English or in the transitional period. Conversely, the verbs attested for the first time in Late Middle English are more than twice as numerous as Early Middle English verbs. Still their involvement in the chronologically heterogeneous sets of diachronic textual prototypes is limited to one in four of the one-root deverbal pairs with the primary verb.

Thirty-four realized possibilities of pair combinatorics (see Matrix 1) in fourteen diachronic paths where the verb is not preceded by any derivative motivated 476 queries to the program designed to find respectively stratified diachronic textual prototypes of verbs and pairs of their one-root coinages. In 380 of the queries the search was successful yielding the total of 2,345 pairs of deverbatives. In 63 of these, however, the *OED* corpus provided us with only a single example, which testifies to the versatility and occasional uniqueness of the paths taken by deverbal lexicon in the process of its diachronic structuring.

The queries to the thirteen diachronic paths where the verb is preceded by a deverbative yielded mostly a negative result. Yet they provide us with 240 one-root pairs.

Table 2. Chronological homogeneity/heterogeneity of the earliest attestations of one-root verbs and deverbatives (EME:1150-1300; LME:1301-1450; ME→ENE: 1451-1500)

Chronological affiliation	TYPES OF DEVERBAL PAIRS							
	substantival		adjectival		mixed		total	
(V D D) <sub>EME</sub>	64	65.3%	4	4.04%	34	34.7%	102	100%
(V D D) <sub>LME</sub>	499	46.6%	52	4.9%	519	48.5%	1,070	100%
(V D D) <sub>ME→ENE</sub>	22	92.7%	2	5.9%	10	29.4%	24	58%
V <sub>EME</sub> (D D) <sub>LME</sub>	333	36.8%	101	11.2%	471	52%	905	100%
V <sub>EME</sub> D <sub>LME</sub> D <sub>E→ENE</sub>	75	27.1%	41	14.8%	161	58.1%	277	100%
V <sub>EME</sub> (DD) <sub>E→ENE</sub>	12	33.4%	5	13.9%	19	12.8%	36	100%
V <sub>LME</sub> (DD) <sub>ME→ENE</sub>	60	34.3%	22	12.6%	93	53.1%	175	100%
(V D) <sub>EME</sub> D <sub>LME</sub>	147	36.5%	22	5.5%	234	58.06%	403	100%
(VD) <sub>EME</sub> D <sub>ME→ENE</sub>	38	44.2%	10	11.6%	38	44.2%	86	100%
(VD) <sub>LME</sub> D <sub>ME→ENE</sub>	192	38.9%	37	7.5%	264	53.6%	493	100%
D <sub>EME</sub> (VD) <sub>LME</sub>	15	12.3%	19	15.6%	88	72.15%	122	100%
D <sub>EME</sub> V <sub>LME</sub> D <sub>ME→ENE</sub>	6	40%	2	13.3%	7	46.7%	15	100%
(D D) <sub>EME</sub> V <sub>ME→ENE</sub>	0		0		0		0	
D <sub>EME</sub> (VD) <sub>ME→ENE</sub>	1		0		0		1	
(DD) <sub>LME</sub> V <sub>ME→ENE</sub>	24	51.1%	2	4.2%	21	44.7%	47	100%
D <sub>LME</sub> (VD) <sub>ME→ENE</sub>	20	45.5%	2	4.5%	22	50%	44	100%
(D D) <sub>EME</sub> V <sub>LME</sub>	8	88.9%	0		1	11.1%	9	100%
D <sub>EME</sub> D <sub>LME</sub> V <sub>E→ENE</sub>	2		0		0		2	

The chronological homogeneity of the first attestations of the verb and both the derivatives is responsible for 32% of the entire corpus of Middle English one-root pairs of deverbatives correlating with Middle English verbs. In the remaining 68% we find chronological heterogeneity surpassing the confines of a

single period. The *OED* offers 103 cases when the earliest attestations of both the derivatives and their parent verb in Middle English occur in the same year.

In comparison with Early Middle English, Late Middle English is characterized by a tenfold increase in the number of pairs of one-root deverbatives. The rate of this increase is uneven. In Early Middle English combinations of a noun and an adjective or participle were outnumbered by combinations of two nouns. In Late Middle English we see the opposite tendency as mixed nounal-adjectival pairs outnumber one-root combinations of two nouns.

The distribution of chronological heterogeneity in pairs of deverbatives with the chronologically primary verb depended upon their part-of-speech affiliation. In one-root combinations of an adjective and/or participle it amounts to 84%, whereas in the combinations of two nouns and a noun plus an adjective or participle it amounts to 61% and 70%, respectively. Most adjectives and participles correlate with nouns rather than with another adjective or participle. Conversely, the nouns correlating with adjectives or participles make up a little over one third of the entire corpus of nouns. In comparison with the chronologically homogeneous textual prototypes the quota of pairs of nouns tends to decrease when the textual prototypes were attested outside one synchronic layer. With chronological heterogeneity the proportion of a one-root noun and adjective/participle tends to increase (Table 2).

#### 9. The rise of pairs of deverbatives and an extension of the computerized framework

The assessment of the order of the appearance of deverbal categories over time is carried out by applying the computerized procedure reflected in a separate lattice. That procedure fulfils two tasks. In a separate sub-lattice all diachronic binding patterns of Middle English deverbatives are established and the complete list of examples for each is shown. In the second sub-lattice each theoretical pattern of diachronic binding is checked against the accumulated factual evidence. Pairs of derivatives are found not only in exclusive two-member deverbal paradigms but also in the respective paradigms of larger size. In the symbolic notation temporal homogeneity is marked by a comma and temporal heterogeneity by a semicolon. There are two results of this search: the respective list of deverbal word-forming families with the pair of deverbatives in question and a curve showing the occurrence (axis Y) of the chronological heterogeneity values measured in years, which exceed the accepted homogeneity threshold, of the previous and subsequent positions in the sequence (axis X). The data base is to be rebuilt each time this threshold is chosen.

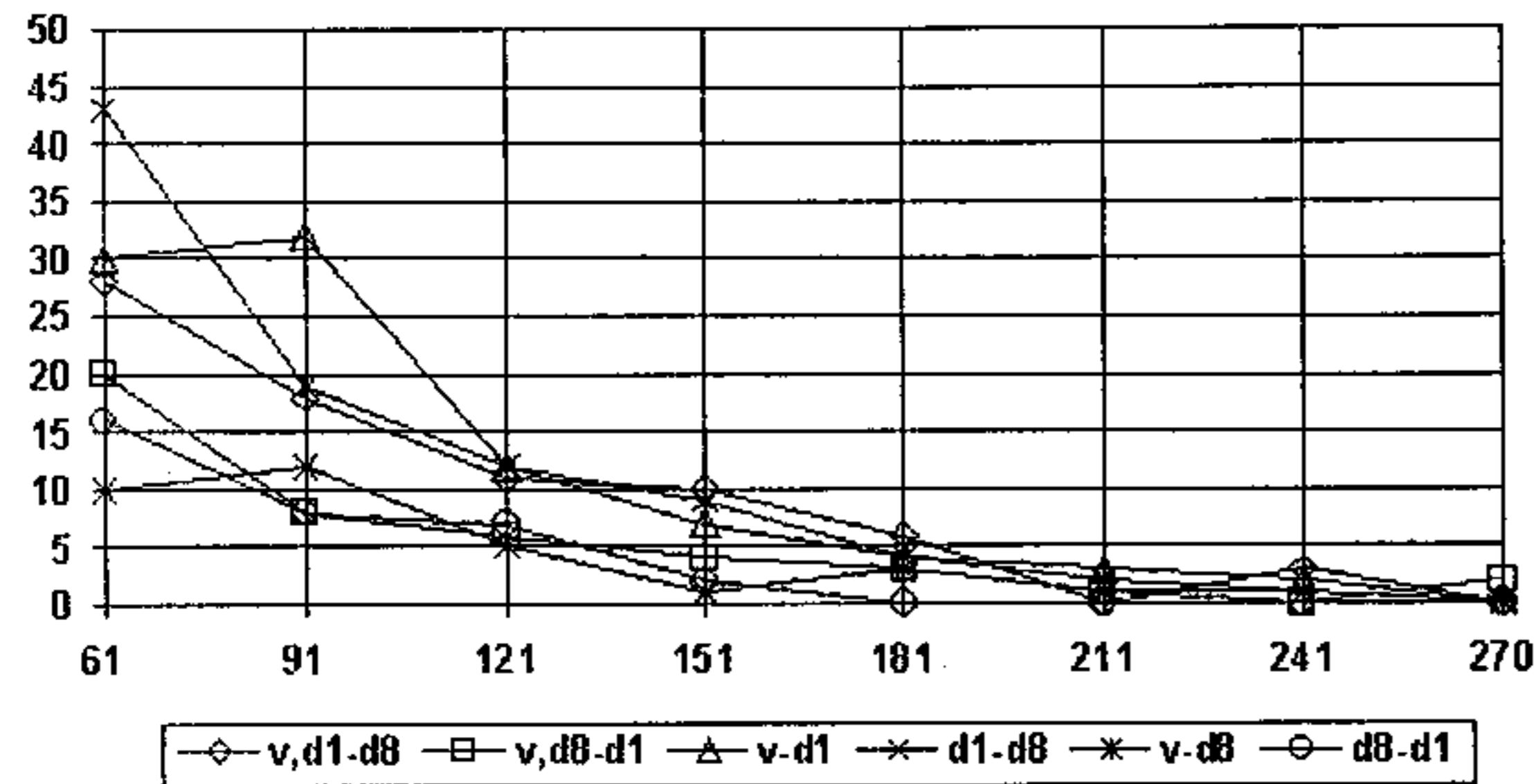
#### 10. Assessing the distribution of age difference between the constituents of deverbal pairs

The chronological curve shows the distribution of the time lag within a pair of deverbatives or between a verb and a deverbative. The drawing of a curve is based on having a sufficient number of the attested cases and serves as an aid to visualization. The curves for various diachronic paths can be put on one picture for the sake of comparison. They are also related to a succession of symbolic notations after the graph.

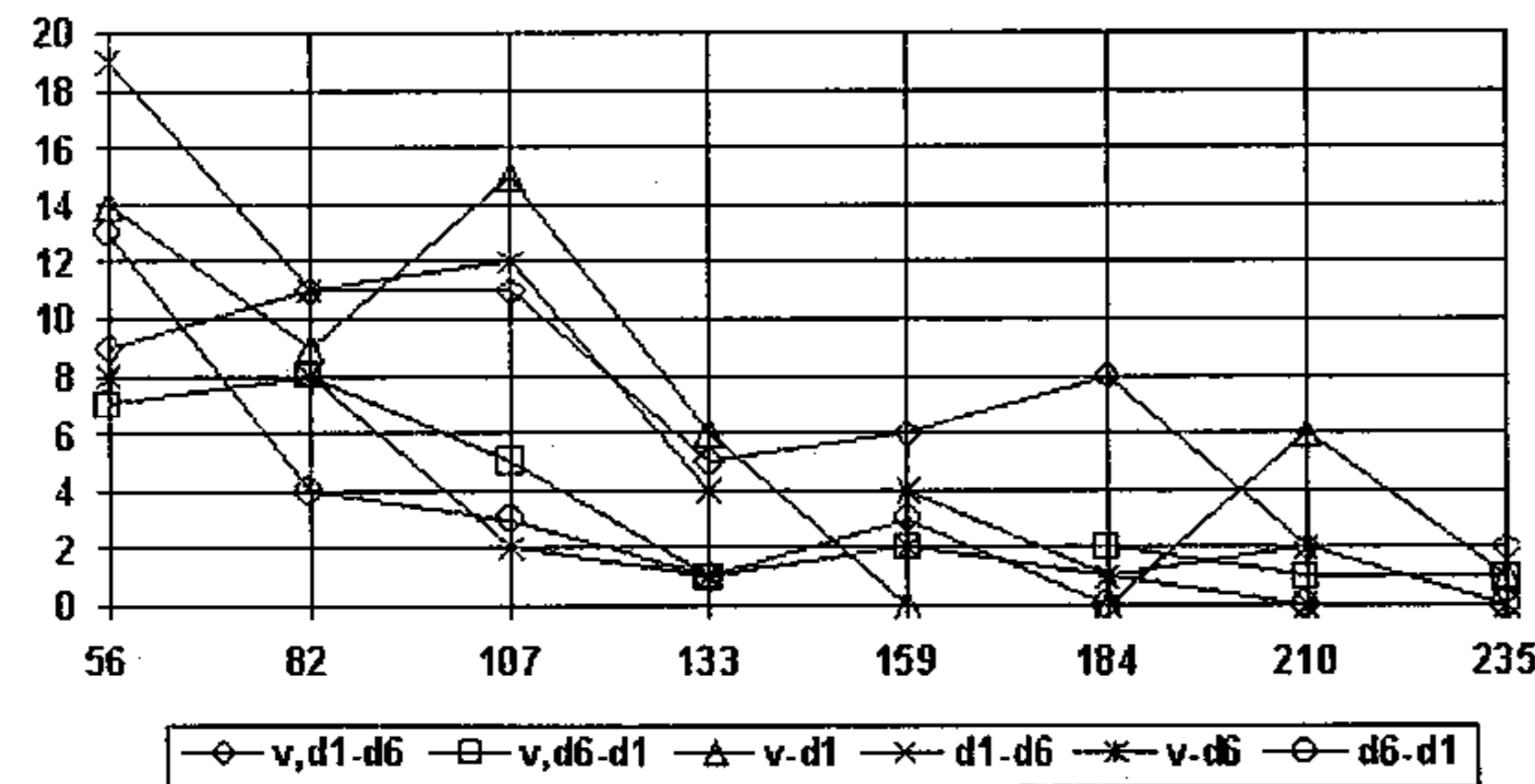
Each point on the curve represents the amount of cases characterized by the difference in age between one-root constituents within a certain range of its values. This range is given in years and indicated on axis X. The number of ranges is a changing characteristic accepted arbitrarily. The point on the extreme left-hand side is the end point of the age difference range bordering on the accepted homogeneity threshold. Typically the curve is characterized by an overall numeric drop. This means that the number of cases within the ranges of age difference tends to decrease as the age difference grows. The speed of this decrease varies depending upon the compared categories, as is reflected in the steepness of the falling curve. However, its continuity can also be interrupted, which is reflected in the upward movement of the curve. This means that there is a greater number of attested cases within the range in question in comparison with the previous one. In this way it is possible to recreate the speed with which the derivation processes "slows down". For example, the speed of the first chronological link in the one-root sequence of a verb combined with an action noun and a past participle as well as that of the first chronological link in the sequence of a verb combined with a past participle and an action noun is lower than the speed of the second chronological link in either case (cf. curves 3 and 5 with curves 4 and 6 on Fig. 1a). When the verb occurs within the set homogeneity threshold with either derivative its other counterpart is characterized by identical proportions as regards the distribution of the age difference values (cf. curves 1 and 2 on Fig. 1a). The distribution of the age difference values in the case of the present participle is different. There are notably more upward movements on the curves, which testifies to a lower speed of the word-forming processes (cf. Fig. 1a and 1b).

Figure 1. Distribution of the age difference between one-root verbs, action nouns (aggregate lexemic calculus of  $d_1$  and  $d_2$ ) and participles (homogeneity threshold set at thirty years)

a) the case of past participle

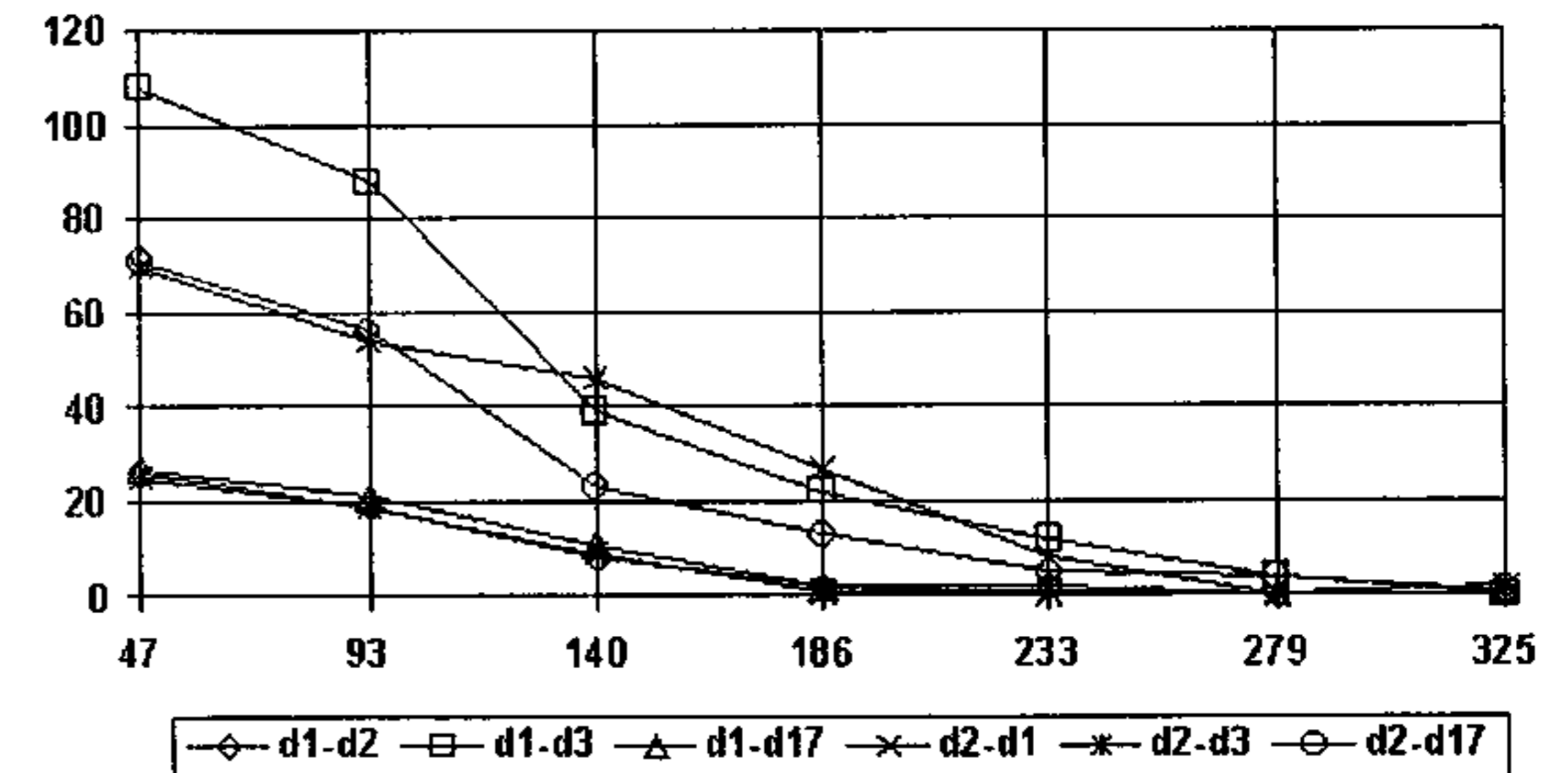


b) the case of present participle

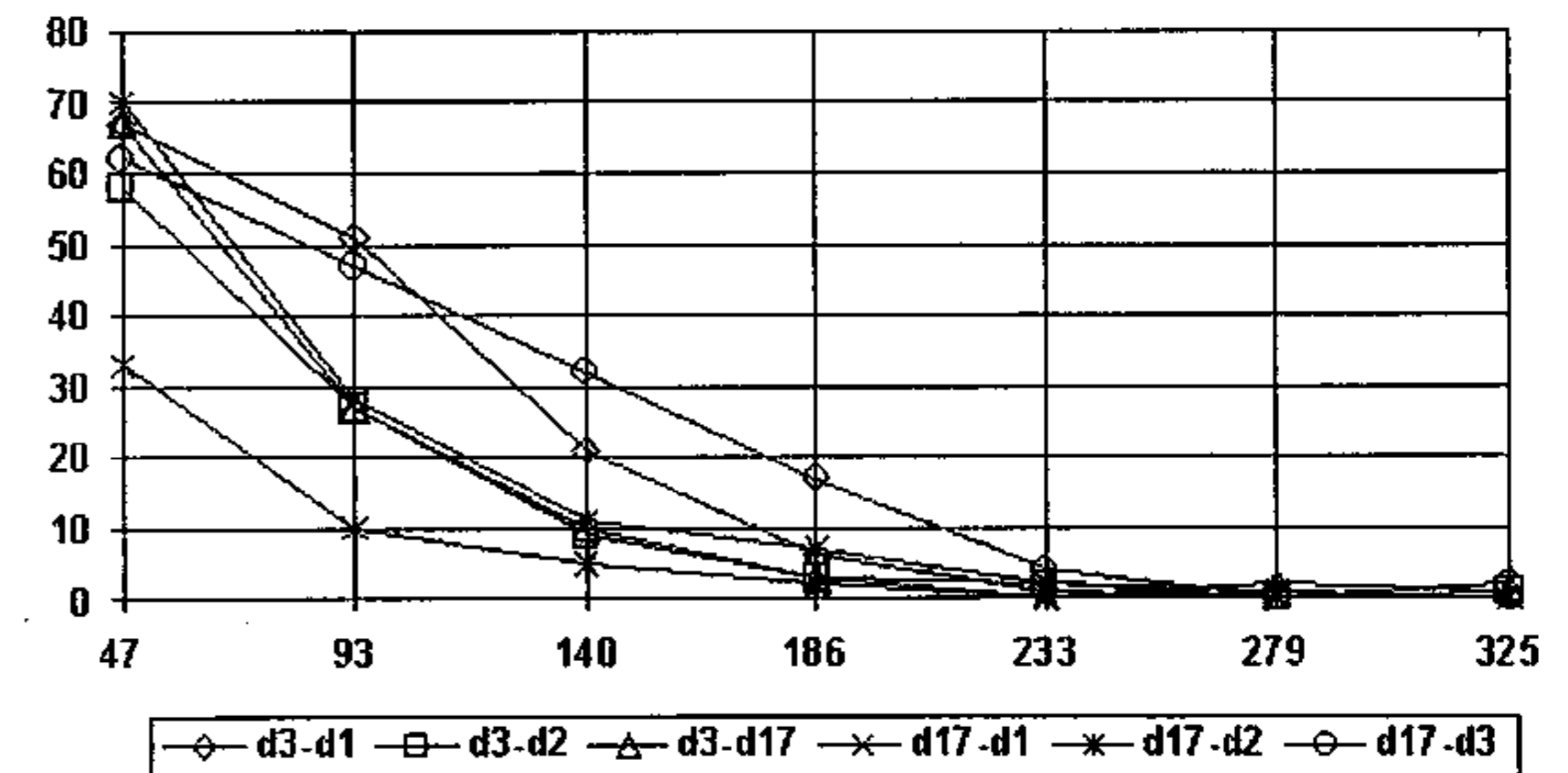


The fact that a new coinage arose after the previously attested one can be seen as its one-root derivational complementation. In the substantival step of derivation under the condition that there are no constraints on chronological heterogeneity (only the same year attestations are taken for chronologically homogeneous ones) the curves for the diachronic precedence of both classes of action nouns are flatter than the curves when action nouns find themselves in the position of a younger counterpart of a binary sequence (cf. Fig. 2a and 2b). This leads me to suggest that action nouns tended to complement other substantival deverbatives more quickly than they tended to get complemented by them.

Figure 2. Distribution of the age difference between one-root deverbal substantives  
a) diachronic precedence of action nouns and their lexicalizations



b) action nouns and their lexicalization in the chronologically secondary position



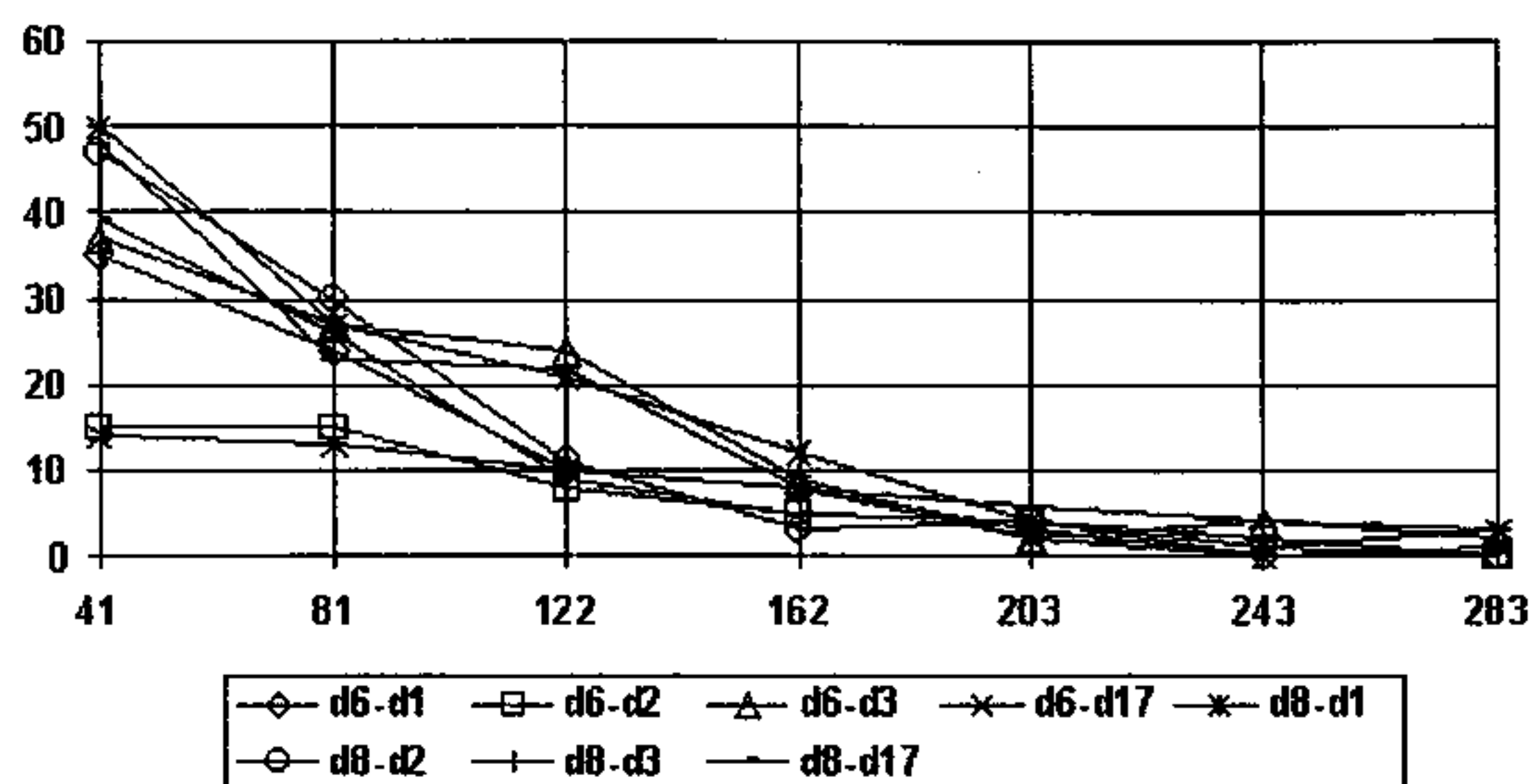
In the adjectival step of deverbalization the age difference curves for the one-root pairs of deverbal coinages with precedent adjectives are on the whole descending (Fig. 3a). When the deverbal adjective was the first constituent to appear in a binary correlation its complementation with a one-root participle or adjective was faster than that of the precedent participle, especially in the case of past participle complemented by a passive modal adjective. For that matter, the curves on Fig. 3b occupy more space on the graph; they are also flatter and reveal more upward movements (cf. curves 1, 3, 5, 6 on Fig. 3a with curves 2 and 6 on Fig. 3b).



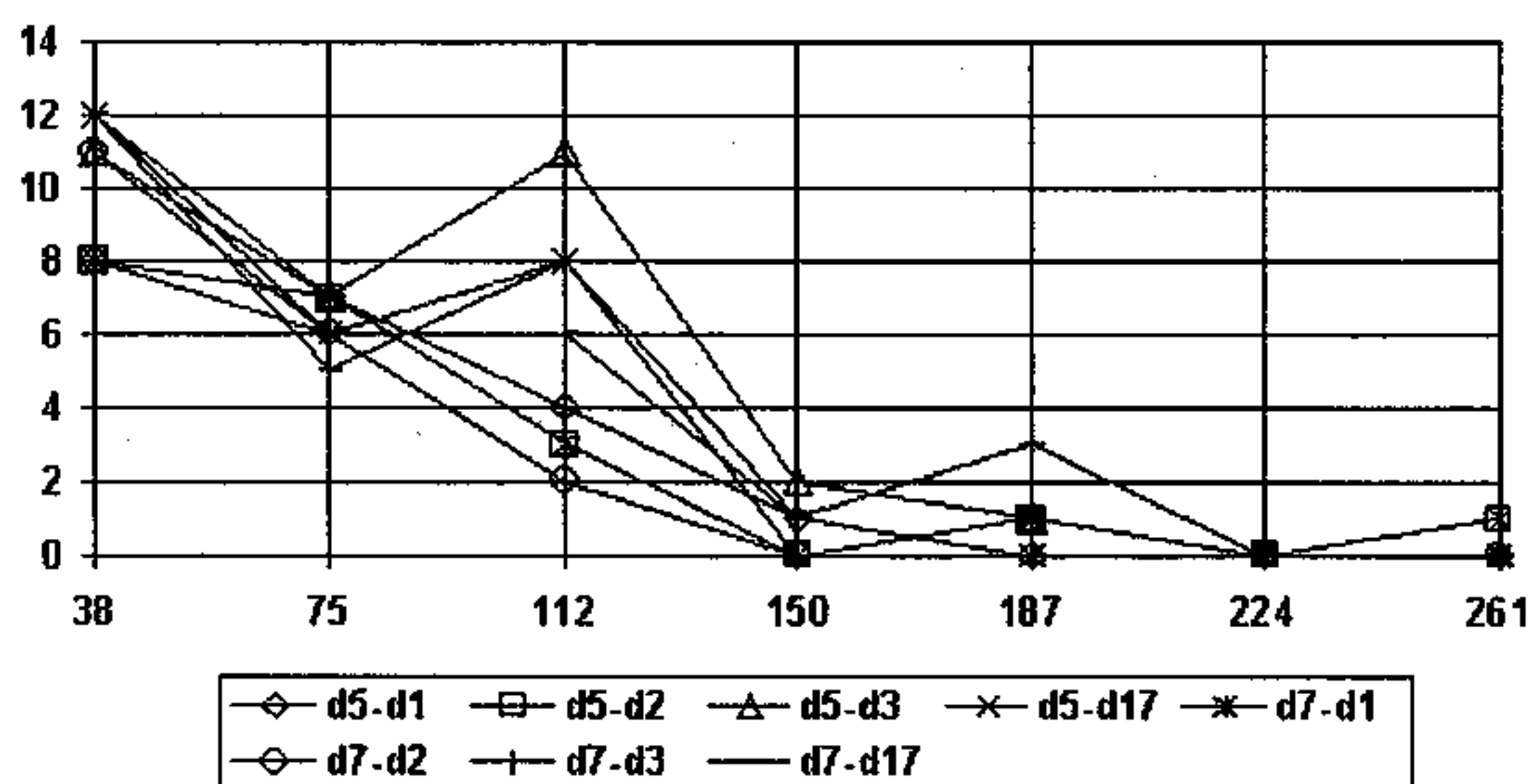


Figure 5. Pairs of deverbatives with the diachronic subsequence of a noun.

## a) diachronic precedence of a participle



## b) diachronic precedence of an adjective



The curves showing relatedness of deverbal nouns reveal higher maximum values of the age difference between the pair constituents in comparison with those representing one-root adjectives. Likewise, in the inter-parts-of-speech correlations precedent nouns are characterized by higher maximum age difference values than precedent adjectives or participles (cf. the extreme right-hand side value on axis X of the curves on Fig. 2, 3, 4, 5).

## 11. Concluding remarks

Using the methodology of corpus linguistics to make generalizations about the age of textual prototypes of paradigmatically bound lexemes appears to be a promising area of diachronic lexicology. Together with diagram modelling and manipulation it opens up a novel epistemological perspective on the study of deverbal vocabulary over time.

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