Characterization of adjectival *-ed* and *-ing* forms of psychological verbs in English

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Abstract

This study examines for the first time a very large set of psychological verbs and their derived adjectives in English. To determine whether an item is an adjective or not, we take the standard structural criteria of morphological (-ly *or* un-*), morpho-syntactic (*very*, *-er/*-est *or* more/most*) and syntactic (*seem, look, *or* feel*) characteristics. As for the data, we selected three data bases and gathered those containing certain items in specific contexts, such as whether the item in question takes a* -ly *or* un- *affix, or a comparative or superlative form, or follows* seem, look *or* feel. *We took dictionaries as our source of criteria in checking whether an item was perceived to be an adjective. As a result, we found some hierarchy within adjectives as to whether they take morphological, morpho-syntactic, or syntactic characteristics. The most powerful determinant of adjectives is the morphological characteristic* -ly.

1   Introduction

This paper will first focus on psychological verbs in English which will be divided into three types. It will next examine whether their past and present participles take the *-ly* or *un-* affix, or *more* or *most* form, or follow *seem*, *look* or *feel* by using three corpora,[1] the British National Corpus (BNC), Wordbanks Online (WB), and the Corpus of Contemporary American English (COCA). These structural criteria are generally used by linguists to examine whether the form is an adjective or not. However, there will be some hierarchy among the criteria. Evidence of the hierarchy of the criteria that determine the adjective will be proposed.

2   Psychological verbs

2.1   What are psychological verbs

This article examines the adjectivization of psychological verbs in English. Bachrach, Roy and Stockall (2014: 9) characterize psychological verbs as "stative verbs that express a psychological state and assign the role 'experiencer' (of that psychological state) to one of its arguments". Van Gelderen (2014: 100) also says "Psych-verbs express mental states and involve the inclusion of an experiencer argument. *Frighten* and *fear* are psych-verbs because they need an experiencer argument". Thus, psychological verbs are those verbs where 'Something/ Someone makes someone feel or causes someone to feel/have something.' That is, these verbs include an 'experiencer' and express certain emotional or psychological state.

2.2   Categorization of psychological verbs

First of all, we used four dictionaries to determine the adjective-ness of *-ed* and *-ing* forms of psychological verbs. They are *Collins COBUILD English dictionary for advanced learners* (5th ed. 2006), *Longman dictionary of contemporary English* (5th ed. 2009), *Oxford English dictionary online* (2005), and *Webster's online dictionary* (2009);[2] henceforth, they are abbreviated as COBUILD, Longman, Oxford, and Webster in this article.

As a result of categorization below, psychological verbs are divided into experiencer-object type (A, henceforth), experiencer-subject type (B, henceforth), and those that appear both as A and B type (C, henceforth), i.e., the experiencer appearing both as object and subject. We found 161 verbs belonging to A, 70 belonging to B, and 2 belonging to C, 233 verbs in total.[3] The figures in brackets below represent the number of each verb type.

A.   Experiencer-object type [161]

　　e.g., *content*, *disappoint*, *excite*, *faze*, *frustrate*, *harass*, *interest*, *irritate*, *shock*, *stimulate*

　(1) He contented himself with his lot.
　(2) His behavior/He disappointed us very much.
　(3) The news excited everyone.
　(4) The new program will stimulate {the children to find out/their interest in finding out} the truth about the subject.

B.   Experiencer-subject type [70]

   e.g., *admire*, *dread*, *endure*, *fear*, *pity*, *rage*, *regret*, *sympathize*, *trust*, *wonder*
   (1) Everyone admired his success/him.
   (2) The children dread dark places.
   (3) We pitied him.
   (4) She said nothing, though she sympathized.

C.   Experiencer-object/subject type [2]

   i.e., *stir*, *threaten*
   (1) They/The letter threatened us./ Anonymous telephone callers threatened the life of the man.

Thus, the percentage of experiencer-object type as opposed to the total is 161/233 or 69.1 percent, and experiencer-subject type is 70/233 or 30.0 percent, and experience-object/subject type is 2/233 or 0.9 percent.

3   Adjectivization of psychological verbs into -ed *and* -ing *forms*

3.1   Characteristics of adjectives

Wasow (1977: 339–340), Fabb (1984: 148–151, 154–158, 212), Quirk *et al.* (1985: 403, 1540, 1553), Biber *et al.* (1999: 64, 67–68, 505, 507, 530) and Huddleston and Pullum (2002: 529–532, 572, 1440), etc., pick out the following as characteristics of adjectives. In other words, we can use morphological and syntactic characteristics to show that an item is an adjective.

Morphological characteristics: We can attach the suffix -*ly* onto an adjective and change it to an adverb. We can also attach a prefix *un-* to make it have a negative meaning.

   (1) -*ly* (e.g., kind*ly*, happi*ly*, attractive*ly*)
   (2) *un-* (e.g., *un*kind, *un*happy, *un*attractive)

Morpho-syntactic characteristics: We can attach *very* to an adjective to express its grade or -*er*/-*est* or *more*/*most* to express comparative and superlative forms.

   (1) *very* (e.g., *very* kind, *very* happy, *very* attractive)
   (2) -*er*/-*est* or *more*/*most*[4] (e.g., kind*er*/*est*, happi*er*/*est*; *more*/(the) *most* attractive)

Syntactic characteristics: The verbs *seem*, *look*, and *feel* may select adjectives.

   (1) *seem*/-*s*/-*ed*, *look*/-*s*/-*ed*, *feel*/-*s*/felt (e.g., *seem* kind/happy/attractive; *look* kind/ happy/attractive; *feel* kind/happy/attractive)

The characteristics given above do not correspond to all adjectives. There are many adjectives that do not meet them; for example, those which can occur only attributively (e.g., *entire*, *mere*, *utter*) or only predicatively (e.g., *afraid*, *alone*, *asleep*, *awake*).

(1) a. The *entire* population of the island is well over one hundred. (entire*ly*, **un*entire, *very entire, *more entire, *seem entire)

   b. He's a *mere* child. (mere*ly*, **un*mere, *very mere, *more mere, *seem mere)

(2) a. The man feels *alone*. (*alone*ly*, **un*alone, *very alone, *more* alone, *feel* alone)

   b. She was *asleep* there. (*asleep*ly*, **un*asleep, *very* asleep, *more* asleep, *seem* asleep)

3.2   The **-ed**[5] and **-ing** *forms of psychological verbs*

We test psychological verbs in *-ed* and *-ing* forms for their adjective-ness.

Morphological characteristics[6]

(1) *-ly*   (e.g., He replied excited*ly*. The movie seemed excit-ing*ly* new.)

(2) *un-*   (e.g., He will make an *un*excited appraisal of the situation. This is an *un*exciting novel.)

Morpho-syntactic characteristics

(1) *very*   (e.g., The lady was *very* excited to hear that. We took a *very* exciting trip to Paris.)

(2) *more*/*most*   (e.g., I was *more* excited about the discovery than he. This story is *more* exciting than that. She was the *most* excited about going there. His song is the *most* exciting.)

Syntactic characteristics[7]

(1) *seem/-s/-ed, look/-s/-ed, feel/-s/felt*

          (e.g., She *seemed/looked/felt* excited at his offer. Her smile *seems/looks* exciting to him.)

4 Data and results

4.1 Data

We used three corpora – The British National Corpus (BNC), Wordbanks Online (WB) and the Corpus of Contemporary American English (COCA) – to determine occurrences of the forms as adjectives.

(a)   The BNC and WB allow us to search by categories. However, we have eliminated those we deemed not to be adjectives from the list we first had. In the same line, the data from COCA have been limited to those considered to be used as adjectives.

e.g., *delighting* ... in BNC, we found four cases of adjectival use, but all of them were of Ving.[8]

e.g., *dreading* ... in WB, we found two cases, but both were of Ving.[9]

(b)   If we found only zero to one instance of cases of morphological, morpho-syntactic or syntactic characteristics listed above, we eliminated that instance. Also, if we found two instances and both were from the same source we eliminated them from the list.

e.g., appalled<u>ly</u> (0), astounded<u>ly</u> (BNC 1, WB 0, COCA 0), annoyed<u>ly</u>[10] (BNC 0, WB 0, COCA 1); <u>un</u>bewildered (0), <u>un</u>perplexed (BNC 1, WB 0, COCA 0); <u>un</u>pained (BNC 1, WB 1 the same source; COCA 0)

(c)   In the case of verbs such as *move*, *touch*, *heat*, *intoxicate*, *disarm*, *rouse*, *punish*, *stir*, we only considered those -ed/-ing forms which were derived as psychological adjectives.

When a dictionary recognizes an item as an adjective, what criteria does it use, morphological characteristics, morpho-syntactic characteristics, or syntactic characteristics? We examined the four dictionaries mentioned above, to see whether they designate each -ed/-ing form of psychological verbs as an adjective. Consider Tables 1, 2, and 3. The 'ok' in the Tables stands for 'acceptable' and * 'unacceptable'. If we found more than two instances for each of morpho-syntactic characteristics *very* and *more·most* or as a total of both, we put 'ok' in the slot as a signal of 'acceptable'. The same was done for syntactic characteristics *seem*, *look*, and *feel*.

In Tables 1–3 the slot *seem*/*look*/*feel* contains -s form (third person singular) and -ed form (past, past participle). C, L, O, and W stand for COBUILD, Longman, Oxford and Webster's dictionaries, respectively. They were written by lin-

guists, and we depend on the dictionaries for licensing adjectives. The *-ed* or *-ing* form is found as an adjective in the entry or in the verb slot in COBUILD, Oxford, and Longman dictionaries. We did not differentiate between them to avoid being too complicated:

Table 1: Examples of occurrences of *-ed/-ing* forms as adjectives in experiencer-object type

-ed/-ing	*-ly/un-*	*very/more·most*	*seem/look/feel*	dictionaries
(1a) interested	ok/ok	ok	ok	C, L, O, W
(1b) interesting	ok/ok	ok	ok	C, L, O, W
(2a) harassed	ok/ok	ok	ok	C, L, *O*, W
(2b) harassing	*/*	*	*	
(3a) shocked	*/ok	ok	ok	C, L, W
(3b) shocking	ok/ok	ok	ok	C, L, O, W
(4a) stimulated	*/ok	ok	ok	W
(4b) stimulating	ok/ok	ok	*	C, L, O, W
(5a) frustrated	ok/*	ok	ok	C, L, O, W
(5b) frustrating	ok/*	ok	*	C, L, O, W
(6a) fazed	*/ok	*	ok	W
(6b) fazing	*/*	*	*	

Table 2: Examples of occurrences of *-ed/-ing* forms as adjectives in experiencer-subject type

-ed/-ing	*-ly/un-*	*very/more·most*	*seem/look/feel*	dictionaries
(7a) trusted	*/ok	ok	*	C, O, W
(7b) trusting	ok/ok	ok	ok	C, L, O, W
(8a) admired	*/ok	ok	ok	L, W
(8b) admiring	ok/*	ok	*	C, L, O, W
(9a) pitied	*/*	ok	*	
(9b) pitying	ok/ok	*	ok	C, L, O, W
(10a) endured	*/*	*	*	
(10b) enduring	ok/*	ok	*	C, L, O, W
(11a) raged	*/*	*	*	

(11b) raging	ok/*	*	*	C, L, O, W
(12a) abhorred	*/*	*	*	
(12b) abhorring	*/*	*	*	

Table 3: Examples of occurrences of *-ed/-ing* forms as adjectives in experiencer-object/subjct type

-ed/-ing	*-ly/un-*	*very/more·most*	*seem/look/feel*	dictionaries
(13a) threatened	*/ok	ok	ok	C, W
(13b) threatening	ok/ok	ok	ok	C, L, O, W

Based on the data shown in Tables 1–3, we scaled the items from 1 to 0 with 1, 'acceptable' and 0, 'unacceptable' to designate the degree of adjective-ness calculated by aggregate estimation for decision of grammatical categories, as shown in (I): 1 shows the word has four acceptable oks, 0.75 three oks, 0.5 two oks, 0.25 only one ok and 0 four unacceptable *s.

(I)	(1a) interested	1	(1b) interesting	1
	(2a) harassed	1	(2b) harassing	0
	(3a) shocked	0.75	(3b) shocking	1
	(4a) stimulated	0.75	(4b) stimulating	0.75
	(5a) frustrated	0.75	(5b) frustrating	0.5
	(6a) fazed	0.5	(6b) fazing	0
	(7a) trusted	0.5	(7b) trusting	1
	(8a) admired	0.75	(8b) admiring	0.5
	(9a) pitied	0.25	(9b) pitying	0.75
	(10a) endured	0	(10b) enduring	0.5
	(11a) raged	0	(11b) raging	0.25
	(12a) abhorred	0	(12b) abhorring	0
	(13a) threatened	0.75	(13b) threatening	1

4.2   Results

From Tables 1–3 and (I), we draw the following:

1) (i) The *-ed/-ing* forms that have morphological, morpho-syntactic, and syntactic characteristics, designated 1 in (I), were considered to be adjectives. The four dictionaries recognize all of them as adjectives.

(ii) On the contrary, those -*ed*/-*ing* forms, which do not have these characteristics and are designated 0 in (I), will not be recognized as adjectives in the four dictionaries, i.e., (2b), (6b), (10a), (11a) and (12a, b) (See Tables 1–2).

2) Among -*ed*/-*ing* forms that have three characteristics of the four, that is, shown as 0.75 in (I), those recognized as adjectives in the four dictionaries (4b, 5a, 9b) can take -*ly*, one of the two morphological characteristics, while the others recognized as adjectives in three (3a), two dictionaries (8a, 13a) or one dictionary (4a) can take morphological *un*-, morpho-syntactic *very*/*more·most* and any syntactic characteristics with *seem*/*look*/*feel*, but not -*ly*.

3) Among -*ed*/-*ing* forms that have two characteristics, that is, shown as 0.5 in (I), those recognized as adjectives in the four dictionaries (5b, 8b, 10b) can take -*ly*, one of the two morphological characteristics, while those recognized as adjectives in three dictionaries (7a) or one (6a) can take morphological *un*-, but not -*ly*.

    If we compare (6a) and (7a), that is, those with similar conditions (either co-occur with *very*/*more·most*, or *seem*/*look*/*feel*), an item is more likely to be recognized as an adjective if it has morpho-syntactic characteristics (7a) (three dictionaries) than the syntactic characteristics of co-occurring with *seem*/*look*/*feel* (6a) (one dictionary).

4) Among -*ed*/-*ing* forms that do not have three characteristics, but only one, that is, are shown as 0.25 in (I), (11b) is recognized as an adjective in the four dictionaries, which can take -*ly*, even if it does not co-occur with *un*-, *very*/*more·most* and *seem*/*look*/*feel*, and (9a) is not recognized as an adjective in any dictionary though it occurs with *very*/*more·most*.

From 1)–4) stated above, the attachability of -*ly* is the most powerful determinant of adjective-ness. The category changing -*ly* is more likely to yield recognition than meaning changing *un*-. Thus, the licensing criteria are morphological characteristics, -*ly* > *un*-, morpho-syntactic characteristics *very*/*more·most* > syntactic characteristics *seem*/*look*/*feel*.

5   Hypotheses verification and justification

Based on the four items raised above, three hypotheses will be set up and verified according to the classification given in A~C, and the reasons will be considered. In doing so, the numbers of the respective -*ed*/-*ing* forms will be given.

Hypothesis 1

The -*ed*/-*ing* forms that have four adjectival characteristics are naturally recognized as adjectives, and those that do not are definitely not.

(i)   The -*ed*/-*ing* forms that have four or no adjectival characteristics are shown in number of words and the percentage according to groups in Table 4: (The number of dictionaries (D) which authorize -*ed*/-*ing* forms as adjectives is shown in each Table. See Appendix 2 (1).):

Table 4:   Number of -*ed*/-*ing* forms with <u>four</u> or <u>no</u> adjective characteristics

Group			A	+	B	+	C	Total
-*ed* form	(<u>Four</u>)	4 ~ 3Ds	23	+	0	+	0	23/23 (100%)
	(<u>No</u>)	0 ~ 1D	11	+	17	+	0	28/28 (100%)
-*ing* form	(<u>Four</u>)	4 ~ 3Ds	23	+	5	+	1	29/29 (100%)
	(<u>No</u>)	0 ~1(or 2)D	44	+	44	+	0	88/88 (100%)

All the -*ed* and -*ing* forms with four adjective characteristics were recognized by the three or four dictionaries. As for -*ed* forms, no words were found for the B group, the experiencer-subject type, and the C group, experiencer-object/subject type. We understand this to be because it is limited to the [+Human] object (experiencer) as a requirement. That is, it makes a [+Human] experiencer as the subject by passivization, it then creates the adjective form, and places focus on the resultative state.

   All the -*ed* and -*ing* forms with no adjective characteristics might not be recognized as adjectives. As for the -*ed* forms, as mentioned earlier, the verb must take experiencer [+Human] object because it is a psychological verb. Thus, the verb belonging to this case can take a [-Animate] object (e.g. *deplore*, *enjoy*), or a Vi (intransitive) (e.g. *aspire*, *sympathize*) because it does not take a passive -*ed* form.

   Therefore, Hypothesis 1 is shown to be true.

   Why were there so many -*ing* forms (88) not used as adjectives? It might be because the verbs were usually used in the passive form and so they did not appear as -*ing* forms (e.g., *bemusing*, *chagrining*, *satiating*), or since they were stative verbs, they could not be used in the progressive, and thus were not used in -*ing* forms (e.g., *despising*, *liking*, *hating*, *respecting*). The former were especially of the experiencer-object group of the A group, and the latter were of experiencer-subject group of the B group.

As can be seen from Table 4, the ratio of *-ed* forms that have all the four characteristics to those that do not have them comes out to 23:28. The ratio of *-ing* forms having all the characteristics to those not having them is 29:88. Thus, those not having all the features in *-ed* forms constitute 28/51 (23 +28) (54.9%) and in *-ing* forms constitute 88/117 (29+88) (75.2%), which represent far more cases than those that do. In addition, if we compare *-ed* forms with *-ing* forms, those that have all the features come to 23:29, and those that do not come to 28:88 with both showing more *-ing* forms. Moreover, the *-ing* forms in B group that have no adjective characteristics (44 examples) against all the *-ing* forms in total B group shown in at page 147 above (70 examples) holds more weight 44/ 70 (62.9%), because *-ing* forms usually take [-Animate] subjects and so the *-ing* forms in B group which take the [+Human] subject are not very likely to be recognized as adjectives.

Hypothesis 2
The attachability of *-ly*, one of the two morphological characteristics, is the most powerful determinant of adjectives. The category changing *-ly* is more likely to yield recognition than meaning changing *un-*.

The number of *-ed/-ing* forms that take *-ly/un-* (hereafter, which shows both *-ly* and *un-* co-occur) is shown in Table 5:

Table 5: Number of *-ed/-ing* forms with **-ly/un-** adjective characteristics

Group		A	+	B	+	C	Total
-ed form	4 ~ 3 Ds	3	+	0	+	0	3/3 (100%)
	2 ~ 0 D	0	+	0	+	0	0 (0%)
-ing form	4 ~ 3 Ds	6	+	2	+	1	9/10 (90%)
	2 ~ 0 D	0	+	1	+	0	1/10 (10%)

As seen in Table 5, all four dictionaries recognize *-ed* forms with *-ly/un-* (100%). As for *-ing* forms with *-ly/un-*, except for *feeling* (no occurrence in the corpora, but recognized by two dictionaries other than COBUILD and Webster), all are recognized in the four dictionaries. (See Appendix 2 (2)) This supports Hypothesis 2.

As far as *-ed* forms are concerned, there were no examples for the B group experiencer-subject type and C group experiencer-object/subject type, as was the case with those with all the characteristics in Table 4. The reason is the same as those given for Table 4.

The number of *-ed/-ing* forms that take *-ly* (except those that take both *-ly* and *un-* in Table 5) is shown in Table 6. See Appendix 2 (3):

Table 6: Number of *-ed/-ing* forms with **-ly** adjective characteristic

Group		A	+	B	+	C	Total
-ed form	4 ~ 3 Ds	20	+	3	+	0	23/23 (100%)
	2 ~ 0 D	0	+	0	+	0	0 (0%)
-ing form	4 ~ 3 Ds	69	+	8	+	0	77/89 (86.5%)
	2 ~ 0 D	6	+	6	+	0	12/89 (13.5%)

Compare Table 5 and Table 6. The *-ed* forms taking *-ly* as shown in Table 6 have by far a large number of occurrences as compared with *-ly/un-* in Table 5. (23 examples to 3 examples). Likewise, the *-ing* forms taking *-ly* have/obtain many more occurrences than those taking *-ly/un-* (89 examples to 10 examples). Four to three dictionaries recognize all 23 *-ed* forms with *-ly* as well as all 3 *-ed* forms with *-ly/un-*. With *-ing* form, *-ly* has a high recognition rate (86.5%), as well as *-ly/un-* (90%). That is, *-ly* can easily be suffixed to *-ing* forms.

Let us consider *-ed/-ing* forms with *un-* except those that take both *-ly* and *un-* in Table 5. The number of them is shown in Table 7:

Table 7: Number of *-ed/-ing* forms with **un-** adjective characteristic

Group		A	+	B	+	C	Total
-ed form	4 ~ 3 Ds	29	+	7	+	0	36/69 (52.2%)
	2 ~ 0 D	14	+	17	+	2	33/69 (47.8%)
-ing form	4 ~ 3 Ds	3	+	1	+	0	4/6 (66.7%)
	2 ~ 0 D	1	+	1	+	0	2/6 (33.3%)

The *-ing* forms, in comparison to *-ed* forms, show very low occurrence (6 examples to 69 examples).

If we compare Table 6 with Table 7, we see that the suffix *-ly* more than the prefix *un-* on both cases, *-ed* forms and *-ing* forms, has a higher degree of recognition as adjectives in three or more dictionaries; 100% vs. 52.2%, 86.5% vs. 66.7%, respectively. Therefore, this demonstrates the validity of Hypothesis 2.

The *-ed* forms that can take *-ly* are 23 examples (23/112(23+89) (20.5%)) as opposed to 89 examples for *-ing* forms, while those that can take *un-* are 69 examples (69/75(69+6) (92%)) as opposed to 6 examples for *-ing* forms. Unlike *-ly*, which is easily attachable to *-ing* forms, *un-* is easily attachable to *-ed* forms. That is, as opposed to the inherently dynamic *-ing* forms, which are apt to take category changing *-ly*, the inherently stative *-ed* forms take the meaning changing *un-* prefix.

Hypothesis 3

The *-ed*/*-ing* forms that can co-occur with morpho-syntactic characteristics *very*/ *more·most* are more likely to be recognized as adjectives than those that can co-occur with syntactic characteristics *seem*/*look*/*feel* though they are less recognized as adjectives than those that can co-occur with morphological characteristics *-ly* and /or *un-*.

First, we take those *-ed*/*-ing* forms that do not have the two morphological features *-ly*/*un-*, *-ly* or *un-*. Compare figures in Tables 8 to 10:

Table 8: Number of *-ed*/*-ing* forms both with ***very***/***more***/***most*** and ***seem***/***look***/ ***feel*** adjective characteristics (without *-ly* and /nor *un-*)

Group		A	+	B	+	C	Total
-ed form	4 ~ 3 Ds	32	+	2	+	0	34/51 (66.7%)
	2 ~ 0 D	13	+	4	+	0	17/51 (33.3%)
-ing form	4 ~ 3 Ds	0	+	0	+	0	0 (0%)
	2 ~ 0 D	0	+	0	+	0	0 (0%)

Table 9: Number of *-ed*/*-ing* forms with ***very***/***more***/***most*** adjective characteristics (neither with *-ly* and /nor *un-* nor with *seem*/*look*/*feel*)

Group		A	+	B	+	C	Total
-ed form	4 ~ 3 Ds	2	+	2	+	0	4/21 (19.0%)
	2 ~ 0 D	2	+	15	+	0	17/21 (81.0%)
-ing form	4 ~ 3 Ds	6	+	0	+	0	6/11 (54.5%)
	2 ~ 0 D	3	+	2	+	0	5/11 (45.5%)

Table 10: Number of *-ed/-ing* forms with **seem/look/feel** adjective characteristics (neither with *-ly* and /nor *un-* nor with *very/more/most*)

Group		A	+	B	+	C	Total
-ed form	4 ~ 3 Ds	1	+	1	+	0	2/15 (13,3%)
	2 ~ 0 D	11	+	2	+	0	13/15 (86,7%)
-ing form	4 ~ 3 Ds	0	+	0	+	0	0 (0%)
	2 ~ 0 D	0	+	0	+	0	0 (0%)

Among those without *-ly* and /nor *un-* characteristics, the *-ed* forms co-occurring with *very/more·most* and *seem/look/feel* (4~3Ds 66.7%), those that take only the former (19.0%), and those that take only the latter, (13.3%), drop in recognition in that order. Therefore, Hypothesis 3 can be said to be true.

The *-ed* forms appear in the three cases (Tables 8, 9 and 10), but the *-ing* forms only in one case (Table 9). That is, the *-ing* forms that do not take the two morphological features, *-ly* and /or *un-*, co-occur with *very/more·most*, but not with *seem/look/feel*.

We have observed the degree of recognition as adjective of *-ed/-ing* forms which take *-ly*, *un-*, *very/more·most* or *seem/look/feel*. Here we will omit those which take both *-ly* and *un-* or both *very/more·most* and *seem/look/feel* to make each separate adjective characteristic clear. The following shows the number and the percentage of those which are recognized by the four to three dictionaries and the hierarchy.

      -ed forms: *-ly* 23/23 (100%) (Table 6) > *un-* 36/69 (52.2%) (Table 7) >
              very/more·most 4/21 (19.0%) (Table 9) > *seem/look/feel* 2/15
              (13.3%) (Table 10)
      -ing forms: *-ly* 77/89 (86.5%) (Table 6) > *un-* 4/6 (66.7%) (Table 7) >
              very/more·most 6/11 (54.5%) (Table 9) > *seem/look/feel* 0
              (0%) (Table 10)

Thus, Hypotheses 2 and 3 are proved to be valid.

6   Conclusion

Firstly, we divided psychological verbs into three main classes; we then selected the *-ed* and *-ing* adjectival forms and we next set up/formulated three different hypotheses regarding the forms. We finally demonstrated their validity and examined the reasons that may justify them. In adjectivization, the degree of

recognition was observed in the order, morphological characteristics with *-ly* > *un-* > morpho-syntactic characteristics with *very*/*more·most* > syntactic characteristics with *seem*/*look*/*feel*. These characteristics play an important part in adjectivization. That is, the more we go left of this scale, the higher the degree of recognition. The *-ed* and *-ing* forms involve morphology, so the morphological characteristics are decisive. Moreover, if we compare category changing *-ly* with meaning changing *un-*, forms taking *-ly* are more likely to be recognized as adjectives than meaning changing *un-*. We also found that *-ly* was more easily attached to *-ing* forms and *un-* to *-ed* forms.

Some adjectives with *-ed*/*-ing* take *-ly* or *un-* but others do not. The reasons for this remain unclear. We hope that future studies will clarify this point.

Notes

1. The British National Corpus (BNC: Oxford University) consists of subcorpora of about 90 million written words and 10 million spoken words. Wordbanks Online (WB: Harper Collins) consists of subcorpora of about 42 million written words and 14 million spoken words. The Corpus of Contemporary American English (COCA: Brigham Young University) contains more than 400 million words including spoken and written words. We used BNC as an authoritative corpus, WB as a corpus widely collected in U.K., U.S.A., Australia, etc. and COCA as the largest and balanced corpus of American English.
2. We used COBUILD as a dictionary with the examples, taken from more than 4-billion-word Collins Corpus, showing learners how the words are used in authentic contexts, *Longman dictionary* as a dictionary providing more accurate English in writing and speaking with expanded grammar information, *Oxford English dictionary online* as a free Oxford dictionary which is quick and easy to-use, and *Webster's online dictionary* also as a free, quick and easy to-use Webster's dictionary.
3. See Appendix 1 which shows the adjectives belonging to each type. The first use of psychological verbs was examined by using *Oxford English dictionary online* (2005). The results are shown in the following: OE, ME, and Mod E stand for Old English (circa 450~1150), Middle English (circa 1150~1500), and Modern English (circa 1500~), respectively. (The detailed data of psychological verbs on etymology will be provided to the reader by the author upon request.):

Table 11: Frequency of psychological verbs first used in OE, ME or Mod E

Type	OE	ME	Mod E
experiencer-object	15/161 (9.3%)	96/161 (59.6%)	50/161 (31.1%)
experiencer-subject	13/70 (18.6%)	46/70 (65.7%)	11/70 (15.7%)
experiencer-object/subject	2/2 (100%)	0/2 (0%)	0/2 (0%)

The above shows that about 60 percent of experiencer-object and experiencer-subject types of psychological verbs derived from ME period. The two verbs of the experiencer-object/subject type all derived from OE period.

4. It is generally said that monosyllabic adjectives normally take inflectional forms *-er*/*-est* (e.g., *taller*, *tallest*), disyllabic adjectives ending in *-y*, *-le*, *-ow*, or *-er* can most readily take inflectional forms (e.g., *happier*, *happiest*; *simpler*, *simplest*; *narrower*, *narrowest*; *cleverer*, *cleverest*), and trisyllabic or longer adjectives can only take periphrastic forms (e.g., *more diligent*, *most diligent*). The *-ed* or *-ing* forms take periphrastic forms, even if they are monosyllabic (e.g., *more tired*, *most tired*) (Matsui 2010: 188–194). See Matsui (2010: 188–202) for factors determining the forms of adjectives of comparison.

5. The *-ed* form represents the past participle, not the past, and includes irregular forms; we have only three examples *upset*, *felt*, and *worn*.

6. We can attach the suffix *-ness* onto an adjective and change it into a noun (*kindness*, *happiness*, *attractiveness*). However, we eliminated *-ness* as a morphological characteristic of adjectives because the cases with *-ed* and *-ing* forms of psychological verbs are not many, compared with those with *-ly* and *un-* forms (*-ed* form; 16 *-ness* cases vs. 49 *-ly* cases vs. 95 *un-* cases: *-ing* form; 11 *-ness* cases vs. 128 *-ly* cases vs. 45 *un-* cases). Moreover, the *-ed* and *-ing* forms which take *-ness* suffix can also take *-ly* and/or *un-* affixes except for 3 *-ed* cases (*disconcerted*, *upset*, *besotted*). Thus, we will not look at *-ness* in this article. (See Appendix 2)

7. Some linguists recognize *-ed* and *-ing* forms as adjectives when they can be connected with adjectives by *and* (e.g., Wasow 1977: 339). Though *abhorred* and *harassing*, shown in (12a) and (2b) in Table 2 and Table 1, respectively, do not have adjective characteristics discussed in this article, they are connected with adjectives in BNC or COCA.

    (12a) abhorred: She should be the centre of social life <u>abhorred</u> and <u>dominant</u>. (BNC:ANP)

(2b) harassing: 'harassing and frivolous' (BNC:CTV)

Thus, the coordinate conjoining test can be weak as a discriminant of adjectives. That is, morphological, morpho-syntactic, syntactic tests used in this article are considered to be satisfactory, but the and test may not.

8.   (i)   Delighting delegates, Mr. Kinnock listened the Cabinet to a team of sled dogs. (A2A)

   (ii)   Probably the best known of these is the Royal Navy Historic Flight's AS 5 WB 271 which has been delighting air show audiences in the UK since 1972. (CLU)

   (iii)   Like Hornblower, whose temperament was delighting readers with its contradictions …, Septimus has adopted certain measures of what could be called self-defence. (EC8)

   (iv)   John Ambrose has been turning for many years, delighting competition judges and spectators with his originality and precision. (EFH)

9.   (i)   " …I was dreading being given someone who couldn't do it," he laughs. (EC8)

   (ii)   …Although Rhodry and Enj both had been rather dreading watching her eat, she was a courtly feeder herself… (ukb)

10.   The adverb *annoyedly* appears in the *Oxford English dictionary.*

Corpora

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Appendix 1

Psychological verbs are divided into three main groups as in the following.

A.   experiencer-object type [161]

abash, absorb, affect, aggravate, agitate, agonize/se, alarm, allure, amaze, amuse, anger, anguish, annoy, appall, arouse, astonish, astound, beguile, bemuse, beset, besot, bewilder, bore, bother, captivate, chagrin, charm, cheer, chill, cloy, comfort, confound, confuse, content, convince, daunt, daze, dazzle, deceive, degrade, deject, delight, delude, demean, demoralize, deprave, depress, disaffect, disappoint, disarm, discomfort, disconcert, discontent, discourage, disenchant, disgust, dishearten, disillusion, disinterest, dismay, disorient, dispirit, displease, disquiet, dissatisfy, distract, distress, disturb, elate, embarrass, embitter, enamo(u)r, enchant, energize(se), encourage, enervate, engross, enrage, enrapture, entertain, entrance, exasperate, excite, excruciate, exhaust, exhilarate, fascinate, fatigue, faze, flatter, fluster, frighten, frustrate, fulfill, gratify, harass, harrow, harry, hearten, heat, horrify, humiliate, interest, intimidate, intoxicate,

intrigue, invigorate, irritate, jade, madden, miff, mortify, move, nag, nettle, niggle, offend, oppress, outrage, overjoy, overwhelm, pain, peeve, perplex, perturb, petrify, please, puzzle, pique, rack, refresh, relax, revolt, rivet, rouse, sadden, satiate, satisfy, scare, shame, shatter, shock, sober, spirit, spook, stagger, startle, stimulate, stun, surprise, terrify, tire, thrill, touch, trouble, upset, vex, wear, weary, wither, worry

B. **experience-subject type** [70]

abhor, admire, adore, appreciate, apprehend, approve, arrest, aspire, begrudge, bruise, care, cherish, condemn, credit, deplore, despise, detest, disapprove, discredit, disdain, dislike, distrust, dote, dread, endure, enjoy, envy, esteem, exalt, execrate, experience, exult, fancy, favo(u)r, fear, feel, grudge, hate, idolize/se, lament, laud, like, loathe, love, menace, mind, mourn, pity, praise, prize, punish, rage, regret, relish, repent, resent, **r**espect, revere, revile, savo(u)r, scorn, sympathize/se tolerate, treasure, trust, value, vaunt, venerate, wonder, worship

C. **experiencer-objectsubject type** [2]

stir, threaten

Appendix 2

The italicized words as in (2)–(7) are those that are contrasted, that is, those after versus (vs.). The number after braces shows number of words contrasted. The total number and percentage are shown in first line for each. The underlined -*ed*/ -*ing* forms, such as <u>interested</u>, show that they can take -*ness*.

Hypothesis 1
(1) **Table 4**

   · **-ed** form
  (i) with <u>four</u> adjective characteristics
       4 ~ 3Ds   23/23 (100%)
  A. absorbed, affected, amazed, amused, confounded, confused, convinced, delighted, <u>distracted</u>, distressed, embarrassed, excited, exhausted, frightened, harassed, <u>interested</u>, pleased, <u>relaxed</u>, satisfied, surprised, <u>tired</u>, vexed, worried

(ii) with <u>no</u> adjective characteristics

               0 ~ 1D   28/28 (100%)

A. allured, beguiled, cloyed, excruciated, harrowed, maddened, nagged, nettled, niggled, roused, sobered

B. abhorred, aspired, begrudged, deplored, disapproved, distrusted, doted, endured, enjoyed, execrated, exulted, grudged, raged, relished, savo(u)red, sympathize(se)d, wondered

·-ing form

(i) with <u>four</u> adjective characteristics

               4 ~ 3Ds   29/29 (100%)

A. alarming, alluring, amusing, <u>boring</u>, charming, <u>convincing</u>, daunting, <u>disturbing</u>, embarrassing, encouraging, exciting, flattering, frightening, <u>interesting</u>, intimidating, invigorating, <u>pleasing</u>, refreshing, relaxing, satisfying, shocking, <u>surprising</u>, troubling

B. caring, <u>grudging,</u> <u>loving</u>, menacing, trusting

C. threatening

(ii) with <u>no</u> adjective characteristics

               0 ~ 1D (or 2D)   88/88 (100%)

A. abashing, agitating, angering, bemusing, besetting, besotting, bothering, chagrining, contenting, dazing, dejecting, delighting, deluding, depraving, disenchanting, disinteresting, disaffecting, discontenting, dissatisfying, elating, embittering, enamo(u)ring, enrapturing, fazing, flustering, harassing, harrying, heating, jading, miffing, nettling, oppressing, outraging, overjoying, paining, peeving, perturbing, petrifying, piquing, racking, satiating, scaring, spiriting, spooking

B. abhorring, appreciating, apprehending, cherishing, crediting, deploring, despising, detesting, discrediting, disdaining, disliking, distrusting, dreading, enjoying, envying, esteeming, execrating, experiencing, fancying, favo(u)ring, hating, idoliz/sing, lauding, liking, loathing, minding, mourning, praising, prizing, regretting, relishing, repenting, resenting, respecting, revering, reviling, savo(u)ring, scoring, sympathiz/sing, tolerating, treasuring, valuing, venerating, worship(p)ing

Hypothesis 2

(2) **Table 5** (with **-ly/-*un***)

> **·-ed** form
>
> > 4~3Ds vs. 2~0D   3/3 (100%) : 0 (0%)
>
> **A.** abashed, heated, <u>spirited</u>
>
> **· -ing** form
>
> > 4~3Ds vs. 2~0D   9/10 (90%) : 1/10 (10%)
>
> A. distracting, entertaining, gratifying, moving, stimulating, weary-
>   ing   {6: 0}
> B. approving, pitying: *feeling*   {2: 1}
> C. stirring   {1: 0}

(3) **Table 6** (with **-ly**)

> **·-ed** form
>
> > 4~3Ds vs. 2~0D   23/23 (100%) : 0/23 (0%)
>
> A. agitated, anguished, bemused, bewildered, bored, <u>contented</u>,
>   dazed, dejected, disappointed, discontented, disgusted, <u>disinter-</u>
>   <u>ested</u>, <u>dispirited</u>, elated, exasperated, fascinated, frustrated, irri-
>   tated, perplexed, puzzled   {20: 0}
> B. discredited, <u>exalted</u>, <u>minded</u>   {3: 0}
>
> **· -ing** form
>
> > 4~3Ds vs. 2~0   77/89 (86.5%) : 12/89 (13.5%)
>
> A. absorbing, affecting, aggravating, agoniz/sing, amazing, <u>annoy-</u>
>   <u>ing</u>, appalling, astonishing, astounding, beguiling, bewildering,
>   captivating, cheering, chilling, cloying, comforting, confusing,
>   dazzling, degrading, demeaning, depressing, disappointing, dis-
>   arming, disconcerting, discouraging, <u>disgusting</u>, disheartening,
>   disorienting, dispiriting, disquieting, distressing, enchanting,
>   engrossing, entrancing, exasperating, excruciating, exhausting,
>   exhilarating, fascinating, frustrating, harrowing, heartening, hor-
>   rifying, humiliating, intoxicating, intriguing, irritating, madden-
>   ing, mortifying, nagging, overwhelming, perplexing, puzzling,
>   revolting, riveting, rousing, shattering, sobering, staggering, star-
>   tling, stunning, terrifying, thrilling, touching, upsetting, vexing,
>   wearing, withering, worrying: *confounding, deceiving, discom-*
>   *forting, dismaying, fatiguing, shaming*   {69 : 6}

  B. admiring, adoring, bruising, disapproving, doting, enduring, pun-
ishing, raging: *arresting, begrudging, exulting, lamenting, vaunt-
ing, wondering* {8 : 6}

(4) **Table 7** (with ***un*-**)

  ·**-ed** form
      4~3Ds vs. 2~0D 36/69 (52.2%) : 33/69 (47.8%)

  A. alarmed, aroused, bothered, charmed, depressed, discouraged,
dismayed, disturbed, embittered, enamo(u)red, enchanted, en-
couraged, flustered, fulfilled, intimidated, <u>jaded</u>, offended,
oppressed, perturbed, refreshed, <u>scared</u>, shattered, shocked, star-
tled, thrilled, touched, <u>troubled</u>, withered, worn: *comforted,
daunted, dazzled, deceived, degraded, deluded, fazed, flattered,
gratified, harried, moved, satiated, stimulated, wearied* {29 :
14}

  B. approved, bruised, esteemed, experienced, respected, trusted,
valued: *admired, appreciated, apprehended, cared, credited, fan-
cied, favo(u)red, felt, lamented, liked, loved, mourned, punished,
praised, regretted, repented, resented* {7 : 17}

  C. *stirred, threatened* {0 : 2}

  ·**-ing** form
      4~3Ds vs. 2~0D 4/6 (66.7%) : 2/6 (33.3%)

  A. <u>fulfilling</u>, offending, tiring: *arousing* {3 : 1}

  B. aspiring: *fearing* {1 : 1}

Hypothesis 3
(5) **Table 8** (with ***very/more·most*** and ***seem/look/feel***) (without *-ly* and /nor *un*-)

  ·**-ed** form
      4~3Ds vs. 2~0D 34/51 (66.7%) : 17/51 (33.3%)

  A. agoniz/sed, annoyed, appalled, astonished, astounded, <u>besotted</u>,
demoralized, depraved, <u>disconcerted</u>, disenchanted, disheartened,
disillusioned, disoriented, displeased, dissatisfied, engrossed,
enraged, entranced, exhilarated, fatigued, horrified, humiliated,
intoxicated, miffed, mortified, overjoyed, pained, peeved, petri-
fied, stunned, terrified, <u>upset</u>: *beset, captivated, cheered, chilled,
discomforted, energiz/sed, entertained, heartened, intrigued,
invigorated, outraged, overwhelmed, saddened* {32 : 13}

    B. hated, treasured: *adored, cherished, disliked, menaced*   {2 : 4}

·**-ing** form   (No *-ed*/*-ing* forms)   0 (0%)

(6) **Table 9** (with ***very***/***more·most***) (Neither with *-ly* and /nor *un-* nor with *seem*/*look*/*feel*)

    ·**-ed** form

              4~3Ds vs. 2~0D   4/21 (19.0%) : 17/21 (81.0%)

    A. aggravated, disaffected: *angered, enraptured*   {2 : 2}

    B. dreaded, vaunted: *despised, detested, disdained, envied, feared, idoliz/sed, lauded, loathed, pitied, prized, revered, reviled, tolerated, venerated, worship(p)ed*   {2 : 15}

    ·**-ing** form

              4~3Ds vs. 2~0D   6/11 (54.5%) : 5/11 (45.5%)

    A. demoraliz/sing, displeasing, energiz/sing, enervating, niggling, saddening: *anguishing, disillusioning, enraging*   {6 : 3}

    B. *condemning, exalting*   {0 : 2}

(7) **Table 10** (with ***seem***/***look***/***feel***) (Neither with *-ly* and /nor *un-* nor with *very*/*more·most*)

    ·**-ed** form

              4~3Ds vs. 2~0D   2/15 (13.3%) : 13/15 (86.7%)

    A. enervated: *chagrined, demeaned, disarmed, disquieted, piqued, racked, revolted, riveted, shamed, spooked, staggered*   {1 : 11}

    B. condemned: *arrested, scorned*   {1 : 2}

    ·**-ing** form   (No *-ed*/*-ing* forms)   0 (0%)