Degree Equative Constructions in English

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ABSTRACT

When comparing certain properties between two entities, the evaluation is generally comparatively high or comparatively low. However, a certain type of comparative sentence (hereinafter, a degree equative construction) does not contain the entity to be compared. This study addresses such English degree equative constructions, seeking to identify their grammatical characteristics and describe the circumstances in which they are used by carefully examining their syntactic and semantic properties based on corpora data. To this end, to different analysis types are adopted: raw frequency and collostructional. The study investigates the distributional properties of the parameters to identify which properties degree equative constructions are used to compare. The total number of parameters is only 33, an unexpectedly small number. In addition, the study identifies four different types of degree equative constructions in terms of the relationship between the target of comparison and three other elements: premodificational, postmodificational, predicative, and adverbial. To understand degree equative constructions through collostructional analysis, the study calculates the association strength between the parameters and degree equative constructions. Thirteen parameters are the most strongly associated with the construction, and their value is infinite. Thus, this parameter group can be viewed as providing prototypical meanings.

Keywords: equative construction, collostructional analysis, parameter, degree equatives

1. Introduction

Comparative constructions are used to compare two entities in terms of quality, quantity, or degree. English comparative constructions are notorious for complicated linguistic behavior, such as comparative coordination and various types of ellipsis (i.e., gapping, pseudogapping, stripping, verb phrase ellipsis): Bresnan, 1973, 1976; Corver, 2006; Grimshaw, 1987; Lechner, 2004; Napoli, 1983). Stassen (1985) analyzes the subcomponents of English comparatives with the following terms, as illustrated in (1).

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(1)	*He is*	*more*	*clever*	*than*	*his brother*
	Target of comparison	Parameter marker	Parameter	Standard marker	Standard of comparison

Similarly, equative constructions that express a comparison of equality can also be identified in terms of the following subcomponents, as in (2), where *Jill* is the target of comparison (also termed comparee), and *Liz* is the standard of comparison. Sentence (2) describes the equal degree of cleverness between the referent to be compared Jill and the second referent Liz. The first *as* plays the role of introducing the parameter which is a word expressing a specific property whereas the second *as* plays the role of standard marker. The target of comparison *Jill* functions as an antecedent of the correlate and the standard of comparison *Liz* corresponds to the correlate.

(2)	*Jill is*	*as*	*clever*	*as*	*Liz.*
	Target of comparison	Parameter marker	Parameter	Standard marker	Standard of comparison

Equative constructions denote equality in the degrees of the property compared between two entities. Sentence (2) can be interpreted as (3a), but not (3b) below.

(3) a. Jill is clever to the same degree that Liz is clever.
b. #Jill is clever, and Liz is clever.

Another type of equative construction is illustrated in (4). This type of equative construction is superficially quite similar to typical equative constructions, e.g., (2). Thus, the subcomponents of the sentence can be identified in terms of the structure in (5). If we focus on the meaning of the sentence, the comparee is *whole-sale price increases*, and the property compared is *much*, which refers to the degree of the quantity of the increases, functioning here as the parameter. Interestingly, the value (*35 percent*) exactly expresses the amount of the increases, rather than functioning as the standard of comparison.

(4) a. They registered wholesale price increases of **as** much **as** 35 percent.
(COCA 2004 SPOK)

b. The berm we see here in some cases can be virtually flat: in other cases it could be **as** high **as** 10 meters. (COCA 1991 SPOK)
c. Adult male elephant seals can have canines **as** large **as** 6 inches long. (COCA 2009 ACAD)
d. **As** many **as** 1,500 photographers flood the battlefield. (COCA 2010 TV)
e. I found Perl scripts from **as** early **as** 1997, but I don't know if I actively worked on them. (COCA 2012 BLOG)

(5) *They registered wholesale price increases of as much as 35 percent.*

1	2	3	4	5
Target of comparison (Comparee)	Parameter marker	Parameter	Standard marker?	Standard?

Generally, when we compare two entities in terms of a measurement, the measurement is comparatively high or comparatively low. In the type of equative construction examined in this paper, however, the standard of comparison is not explicit. The major role of the element in the standard position seems to be to connect a scale with a value on that scale. It is difficult to state that this type of equative construction is supposed to be used to make a comparison because no comparison is being asserted in this construction (to judge from the grammatical feature of the element in the position of the standard of comparison). Regular comparatives adopt the absolute form of comparatives, which can be used without stating the entity compared, such as *better job* or *older brother*. Here, we can raise two questions. (1) What do we use this construction to express? (2) Can this type of equative construction also be regarded as an absolute equative construction?

Although comparative constructions have been extensively studied, research on equative constructions has been much less frequent. In addition, this type of equative (hereinafter degree equative constructions) has not been studied in descriptive grammar. It is only sporadically mentioned in Bresnan (1973), Hilpert (2014), Quirk et al. (1985), and Huddleston and Pullum (2002). Therefore, this study aims to carefully investigate degree equative constructions, focusing on their distributional properties in the sentence and seeking to explain the meaning of such constructions. To this end, the study uses raw frequency and collostructional analyses based on corpus data. More specifically, the study's research questions include the following. How many different forms are there of this type of equative constructions? What are the functions of the elements in the standard position?

What is allowed to appear in the parameter position? The research questions are intended to reveal the characteristics that differentiate degree equative constructions from regular equative constructions.

The structure of this paper is as follows. Section 2 briefly reviews the characteristics of equative constructions. Section 3 introduces and explicates the data and method that this study adopts. Section 4 discusses the study's findings and results and identifies the grammatical properties of the degree equative constructions that can be derived from these results.

2. Brief Characteristization of Equative Constructions

English Equative constructions have sporadically been mentioned in several previous studies. Therefore, this study will briefly review only a few key characteristics. It is widely known that English equative constructions, which are used to denote a relation of equality, includes various constructions forming a natural morphological and semantic class, as shown in (6) (Rett 2014). The example in (6a) is referred to as the *same construction*. In the construction, the morphologically fixed expression *the same as* denotes the equation's meaning. The examples in (6b)-(6f) represent manner similative, temporal similative, parenthetical, generic equative, and specific equative constructions, respectively.

(6) a. He exhibited nearly **the same** behavior patterns **as** his younger brother.
same construction (COCA 2000 ACAD)

b. Cover slow cookers with lids and cook **as** manufacturer directs on high setting 6 hours. ***manner similative*** (COCA 2009 MAG)

c. My wife is cooking **as** we speak. ***temporal similative***
(COCA 2002 TV)

d. Money is in our hand, **as** the President said. ***parenthetical***
(COCA 2014 MOV)

e. The note in Talen's voice was **as** hard and cold **as** steel. ***generic equative***
(COCA 1993 FIC)

f. He was **as** young **as** the French Revolution. (***specific***) ***equative***
(COCA 1997 FIC)

Equative constructions generally express situations in which two entities possess a gradable property to the same degree. A scalar interpretation of equality provides a lower bound corresponding to at least equal or not exactly equal, only omitting the inferiority relation. Thus, (7a) implies that a big fruit may be bigger. That is, if a big fruit is as large as a human head, then the size of a big fruit is (at least) equal to that of a human head (Huddleston and Pullum 2002).

(7) a. A big fruit is as big as **a human head**. (COCA 2019 FIC)
b. His face was as white as **a frog's belly**. (COCA 2013 FIC)

The element in the parameter position tends to be sensitive to the countability of the modified noun if there is one. Elements such as *much, little,* and *less* can be used as determiners with respect to noncount nouns, whereas *many* and *few* can be used with count nouns, as in (8) (Quirk et al., 1985).

(8) a. I've as many/*much shirts as Ed.
b. I've as few/*little shirts as Ed.

The element in the standard position must be treated as a clausal element in the sense that the nominative case can occur in this position, as in (9a). This nominative case can be expanded into a clause structure, as in (9b). Focusing on these properties, Bresnan (1973) and Huddleston and Pullum (2002) treat part of the comparative clause as the reduced clause. In particular, they note the ambiguity in (9c) in terms of this analysis. The standard *Liz* in (9c) can be interpreted as a subject as well as an object.

(9) a. She was as tall as he. (COCA 1996 FIC)
b. She was as tall as he was.
c. Sue phoned Angela more often than Liz. (Pullum, 2002, p. 1116)

3. Data and Methods

3.1. Data collection

This section introduces the study's data and method. The data collected for

analysis were drawn from two corpora: the Corpus of Contemporary American English (COCA) and the TIME Magazine Corpus (TIMES). I first extracted 1,000 sample degree equative sentences from the first corpus[1]. Then, I identified 926 sentences that were instances of degree equative patterns, excluding sentences of the type shown in (10). To explain, the phrase *as well as* in (10a) is used as an idiomatic expression denoting "in addition to", whereas the *as* phrases in (10b) and (10c) are used differently than they would be in a degree equative construction. Specifically, the phrase *as soon as* in (10b) denotes that something happens immediately after the other thing, and it does not express the degree meaning. In addition, the phrase *as easily as one* in (10) does not also express the degree because *one* is used as a pronoun, and not as a cardinal number. The search targets were the lexical properties of the parameters, the elements in the standard position, and the syntactic distribution of the comparees and parameters in equative constructions.

(10) a. In all nearly 6,000 died during the American construction period, **as well as 300 US citizens.** (COCA 2014 MAG)
b. **As soon as one kind of bird** moves out, another moves in. (COCA 2011 MAG)
c. This question is not answered **as easily as one** would hope. (COCA 2002 ACAD)

3.2. Methodological considerations and the adopted methods

This study adopts two different analysis types to analyze the corpora: raw frequency and collostructional. First, the study uses raw frequency analysis to identify which word types occur more frequently in the parameter position, to examine the distributional properties of degree equative constructions and to verify whether there is a correlation between parameters and their distributional properties.

Through collostructional analysis (specifically, collexeme analysis: Coll.analysis V3.2a), the study investigates whether there is a correlation between the words occurring in the parameter position and the degree equative constructions. More

1) The final search pattern was like this: * as * as _mc * . The study has attempted to search with several different patterns in order to get the most suitable one in the process of getting this final pattern. With this pattern, the study collected 1,000 sample sentences, and then I found out that this phrase can appear in several positions in a sentence.

specifically, what word types can function prototypically as parameters in degree equative constructions? In addition, the study attempts to verify if there are syntactic or semantic restrictions on the parameter in degree equative constructions, and to establish the prototypical meaning of such constructions. What are the circumstances in which we use these constructions?

Stefanowitsch and Gries (2003) propose a method for assessing the association strength between words and constructions, which is termed collostructional analysis. Collostructional strength can indicate whether the strongest collexemes of a given construction signal the construction's meaning. This study uses this method to calculate association strengths between individual word frequencies and construction using Fisher's exact test. Specifically, the study investigates the association strengths between words corresponding to parameters and equative constructions.

4. Findings and Discussion

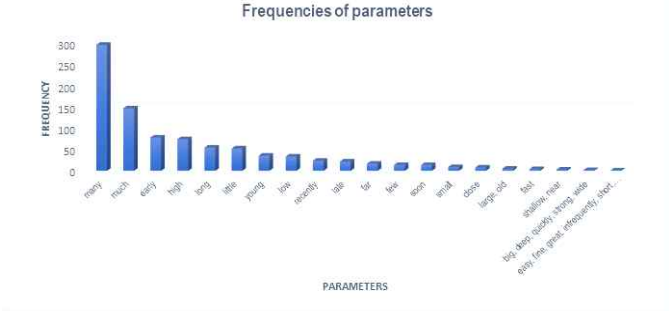
Focusing on the findings derived from these analyses, this section discusses four topics. First, identifying the elements in the parameter position is important because this element triggers the equative comparison. Success in this task helps us understand the circumstances in which this type of equative construction is used. In addition, the syntactic distribution of the target of comparison is examined to better understand how many different equative constructions can be made. The third topic is to verify if there is a relation between parameters and the syntactic distribution of comparees. Last, what are the elements in the position of standard of comparison used to represent?

4.1. Distribution of parameters

Table 1 below ranks the parameters extracted from the 926 sample sentences. A total of 33 different parameters were used in the analyzed equative constructions. The most conspicuous outcome is that two parameters *many* and *much* predominate in terms of use frequency. Thus, nearly half (more precisely 48%) of the examined constructions were this type of equative. This result tentatively implies that equative constructions are much more frequently used than other equative constructions to measure (or evaluate) the quantity of something (the comparee).

Table 1. Frequency of parameters

No.	Parameters	Frequencies	Ratio
1	*many*	298	32.1%
2	*much*	148	15.9%
3	*early*	79	8.5%
4	*high*	75	8.1%
5	*long*	55	5.9%
6	*little*	53	5.6%
7	*young*	36	3.9%
8	*low*	34	3.7%
9	*recently*	24	2.6%
10	*late*	22	2.4%
11	*far*	17	1.8%
12	*few*	14	1.5%
13	*soon*	14	1.3%
14	*small*	9	1.0%
15	*close*	8	0.9%
16	*large, old*	5 × 2 (10)	1.1%
17	*fast*	4	0.4%
18	*shallow, near*	3 × 2 (6)	0.6%
19	*big, deep, quickly, strong, wide*	2 × 5 (10)	1.1%
20	*easy, fine, great, infrequently, short, simple, tall, thin*	1 × 8 (8)	1.4%
	Total	926	100.0%



Generally, we can note the markedness properties from the gradable adjectives that are used to measure the properties of the entities in a sentence. With gradable antonyms such as *high*/*low*, one adjective is marked (i.e., *low*) and the other unmarked (i.e., *high*). The unmarked member of the pair is the one that is used

in questions of degree or measurement. For instance, the question and answer in (11a) and (11b) have the adjective *high* instead of *low* as the unmarked member.

(11) a. How high/*low is the building?
b. The building is three stories high/*low.
c. Children as young as 12 are receiving military training in Mosul City. (COCA 2014 NEWS)
d. We were less sure whether children as old as 7 years would have mastered control of WS stress contrastivity. (COCA 2012 ACAD)

Similarly, we must verify if these unmarked properties can also be found in equative constructions. As Table 1 indicates there may not be such a restriction on the distribution of parameters, in the sense that pairs such as *old/young, high/low, big/small* are naturally used as parameters in this construction. The sentences in (11c) and (11d) show that a pair of *old/young* can occur in the degree equative constructions.

4.2. Syntactic distribution of the comparee as a modified noun

4.2.1. Types of degree equative construction

To determine the internal structure of degree equative constructions, this study investigates the syntactic distribution of the target of comparison equivalent to a modified noun within the constructions. In the analyzed corpora data, the study observes four different syntactic distributions in which the target of comparison can appear. Thus, the study finds there are four types of degree equative construction in terms of the relation between the target of comparison and three other elements: premodificational, postmodificational, predicative, and adverbial.

The first, the premodificational type, is illustrated in (12). The elements in the subject position consist of a parameter marker, a parameter, a standard marker, a standard of comparison and the target of comparison[2]. The target of comparison is modified by the four other elements that are in the attributive position. Some of the sentences in this type show that the preposition *of* can be optionally inserted between the target of comparison and the standard of comparison.

2) For convenience, this study refers to the parameter marker, parameter, standard marker, and standard of comparison as "the four other elements".

(12) a. Each year **as many as seventy million sharks** are slaughtered to make shark fin soup, a delicacy in Asia. (COCA 2010 SPOK)
b. A single 12-ounce can of soda has **as much as 13 teaspoons of sugar** in the form of high fructose corn syrup. (COCA 2004 NEWS)

The examples in (13) have the target of comparison in an initial position followed by the four other elements, and correspond to the postmodification type. In this type, the preposition *of* can intervene between the target of comparison and the parameter marker, as shown in (13). The examples in (14), however, show that inserting the preposition *of* is not allowed.

(13) a. Food lines have **profit margins of as high as 40 percent,** compared with about 12 percent overall at Praxair, he said. (COCA 2001 NEWS)
b. Vistnes found that areas subjected to repetitive stress may show temperatures 5 degrees Centigrade or more higher than similar unstressed areas and that differences in **temperature of as little as 1 degree Centigrade** can be clinically significant. (COCA 1991 ACAD)

(14) a. **Kids as young as 5 years old** whizzed down the tracks. (COCA 2016 NEWS)
b. This radiant floor can make use of **water as cool as 85 degrees** to heat the floors. (COCA 2007 MAG)

The target of comparison in (15) is in the subject position of the sentence and the four other elements are in the predicative complement position. This type is termed predicative.

(15) a. For minorities, the rate was **as high as 40 percent.** (COCA 1991 NEWS)
b. Some were as young as 11, some were **as old as 21**. (COCA 2002 SPOK)

The last type, which is termed the adverbial type, has a target of comparison in the predicate position. The four other elements are in the final position of the sentence, serving as a modifier, as illustrated in (16).

(16) a. Those are just some of the questions as U.S. troops now move **as far as 60 miles** into northern Iraq to establish refugee camps. (COCA 1991 SPOK)

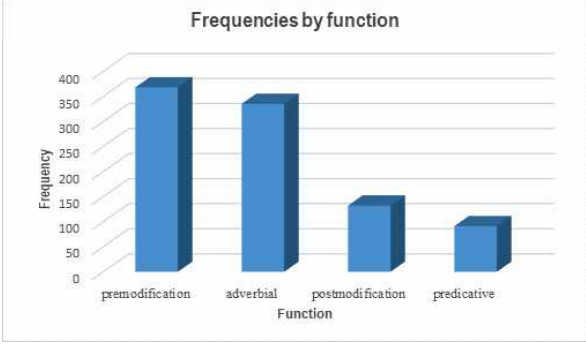
b. In the past, VW workers worked **as few as 29 hours a week**. (COCA 1995 NEWS)

c. Common shiners are generally three to four inches long, but can grow **as large as six inches.** (COCA 1992 MAG)

This study calculates frequencies to determine which of the four types are most frequently used. Table 2 shows the results. The premodificational type was most frequently used: 368 times (39.7%). Next was the adverbial type, with a frequency of 335, followed by the postmodification and predicative types.

Table 2. Frequencies by degree equative type

Function	Frequency	Ratio
Premodification	368	39.7%
Adverbial	335	36.2%
Postmodification	132	14.3%
Predicative	91	9.8%
Total	926	100.0%



That there are four different types of degree equative construction represents one prominent respect in which such constructions differ from other comparative constructions.

4.2.2. Constituency

Focusing on the four types of equative construction introduced in the previous section, this study obtains intriguing results regarding constituency, particularly by examining the internal structure of the equative construction. First, the sentences in (17) show that the target of comparison does not form a constituent with the four other elements, because the predicational type (17c) and the adverbial type in (17d) have the target of comparison in the subject position. In addition, the sentences in (17a) and (17b) show that the four other elements make a constituent syntactic unit, corresponding to a subconstituent. Similarly, the example in (17e) makes clear that the boldface phrase *kids as young as 6 years old* functions as a subject of a comparative clause positioned after the preposition *about*. Based on these syntactic distributions, this study concludes that the four elements (i.e. parameter marker, parameter, standard marker, and standard) must be a single constituent.

(17) a. And if you're not sent somewhere else, overcrowding can lead to **waits (of) as long as two days.** (COCA 2006 SPOK)
b. With **as little as 18 hours (of) training**, you can place ads in the Yellow Pages stating that you're certified to treat. You can hand out business cards, which often have fancy sounding initials after your name. (COCA 1994 SPOK)
c. The distribution center could be **as large as 650,000 square feet.** (COCA 2001 NEWS)
d. The evidence is that people who go into the workforce during a recession have lower incomes even **as long as fifteen years later**. (COCA 2009 SPOK)
e. I just saw the MSM (CBS) run a story about **kids as young as 6 yrs. old** being trained to be "terrorists" by AL QAEDA. (COCA 2012 BLOG)

Last, the combined elements "target of comparison + as + parameter + as + the standard" also form one constituent in the sentence, behaving as a noun phrase whose head is a target of comparison modified by the four other elements. Such combinations occur in the oblique object position in (17a) and (17b). The four other

elements functioning as a modifier can occupy the predicative complement position, as in (17c), as well as the attributive position, as in (17b) and (17d). More interestingly, the combination can also function as adverbial, as in (17d). The sentences in (17a) and (17b) indicate that the four other elements prefer to be treated as a noun phrase rather than an adjective phrase because the elements optionally appear after the preposition *of.*

4.3. Distribution of parameters by function

The question regarding whether there is a relationship between the parameters and the equative construction types can be raised. More specifically, one can ask whether a particular construction type tends to prefer a certain parameter to others. Table 4.1 shows how differently each parameter functions in degree equative constructions. This study selected from Table 3 the major parameters most meaningful to note here and Table 4 displays the distribution of these major parameters by function. In Table 4, the function of the parameter *many* stands out in that in most examples of its use it functions as a premodification. The parameter *early* is used exclusively as an adverbial (99 percent of its total frequency), whereas the parameter *young* primarily plays a postmodificational role (97 percent of its total frequency).

Based on this finding, we also argue there must be a correlation between parameters and their (syntactic) functions[3]. This can be additionally strengthened in terms of the result from the collostructional analysis in Table 7, in the sense that the top-ranked parameters show a stronger tendency to perform a particular syntactic function than the other parameters do.

Table 3. Distribution of parameters by function

No.	Parameter	Premodification	Postmodification	Predicative	Adverbial	Totals
1	*big*		1	1		2
2	*close*		2		6	8
3	*deep*		1		1	2
4	*early*			1	78	79

3) Some reviewers made helpful comment on the claim that there are correlations between parameters and their functions. Specifically, they commented that the study requires additional explanation on why there exists such a correlation. The study judges that it is not simple to explain in this paper, thus requiring research study outside this paper.

Table 3. Continued

No.	Parameter	Premodification	Postmodification	Predicative	Adverbial	Totals
5	*easy*			1		1
6	*far*	1	2		14	17
7	*fast*				4	4
8	*few*	10	2	2		14
9	*fine*		1			1
10	*great*		1			1
11	*high*	1	23	31	20	75
12	*infrequently*				1	1
13	*large*		3	2		5
14	*late*			1	21	22
15	*little*	11	5	2	35	53
16	*long*	4	10	8	33	55
17	*low*	1	11	8	14	34
18	*many*	291	3		4	298
19	*much*	63	23	20	42	148
20	*near*		1		2	3
21	*old*		1	4		5
22	*quickly*			1	1	2
23	*recently*				24	24
24	*shallow*		1	2		3
25	*short*				1	1
26	*simple*			1		1
27	*small*		7	2		9
28	*soon*				14	14
29	*strong*		2			2
30	*tall*			3		3
31	*thin*		1			1
32	*wide*			2		2
33	*young*		35	1		36
	Totals	383	136	92	315	926

Table 4. Major distribution prominence

No.	Parameter	Premodification	Postmodification	Adverbial	Totals (100%)
1	*many*	291 (98%)			298
2	*early*			78 (99%)	79
3	*much*	63 (43%)			148
4	*little*			35 (66%)	53
5	*young*		35 (97%)		36
6	*long*			33 (60%)	55

4.4. Cognitive factors

This study sought to determine what a numerical value in a standard position signifies, thereby verifying the interpretation of these values. For instance, the value *35 percent* in (18) represents the amount of wholesale price increases. To this end, the study first investigated what the numerical value in the standard position represents in the sentence.

(18) Basic structure of degree equative construction

They registered	***wholesale price increases of***	***as***	***much***	***as***	***35 percent.***
	1	2	3	4	5
	Comparee	Degree marker	Parameter	Standard marker?	Standard?

Regarding these interpretations, this study could observe 10 referential meanings derived from the numerical values, thus justifying their frequencies. Table 5 shows the frequency of the denotation that the value in the standard position designates. The top-ranked item is number, accounting for 34.2% of total frequency, followed by time, amount, and size. The study classifies number[4] into two types: numbers for counting the animate entities and numbers for counting inanimate entities. From Table 5, we can predict that most degree equative constructions are used to denote the numerical values of animate or inanimate entities or to describe the

4) The study has attempted to find out why the parameter many is the most frequently or strongly used especially in the degree equative constructions. Thus, the study examined the data more deeply by classifying it into animate entities and nonanimate ones, and the result tell us that it does not matter, against our expectation.

duration or amount of certain entities, together accounting for nearly 79 percent of total frequency.

Table 5. Frequency of referential meaning

No.	Meaning	Frequency	Ratio
1	number (animate) (184) number (inanimate) (133)	317	34.2%
2	time	252	27.2%
3	amount	163	17.6%
4	size	63	6.8%
5	age	37	4.0%
6	distance	34	3.7%
7	ratio	14	1.5%
8	temperature degree	14	1.5%
9	frequency	13	1.4%
10	speed	11	1.2%
11	weight	8	0.9%
	Totals	926	100.0%

This study also examined whether a particular parameter was more frequently used to denote a particular referential meaning by carefully analyzing the distributional properties of the value by parameter. Table 6 displays the distributional properties of the value in the standard position by parameter. The table shows which parameter occupies the top position for each meaning of the value, thus implying there might be a degree of correlation between parameter distribution and the meaning of the value. The parameter *much*, for instance, is preferably selected to denote the amount corresponding to a certain value. In contrast, the parameter *many* is more frequently used to express the numerical number of a certain entity. More interestingly, the parameters *early* and *long* are more readily used to represent the degree of time.

This finding implies there may be a (preference) correlation between parameters and the meaning of their values. More specifically, a certain value meaning tends to prefer a particular parameter in a degree equative construction.

Table 6. Parameter priority by the meaning of value

[1]	[2]	[3]	[1]	[2]	[3]	[1]	[2]	[3]	[1]	[2]	[3]
age	36	*young*	number (inanimate)	6	*low*	size	3	*shallow*	time	24	*recently*
amount	99	*much*		5	*few*		2	*many*		22	*late*
	21	*high*		4	*much*		2	*big*		14	*much*
	16	*little*		3	*little*		2	*thick*		14	*soon*
	14	*low*		1	*simple*		2	*wide*		6	*many*
	9	*many*	number (animate)	165	*many*		1	*thin*		5	*far*
distance	10	*far*		8	*high*		1	*far*		4	*old*
	7	*close*		6	*few*		1	*fine*		3	*few*
	4	*little*		3	*much*		1	*low*		2	*quickly*
	4	*many*		1	*large*		1	*tall*		1	*close*
	3	*high*		1	*little*	speed	5	*high*		1	*easy*
	2	*deep*	ratio	13	*high*		4	*fast*		1	*great*
	2	*near*		1	*much*		2	*strong*		1	*near*
	1	*low*	score	1	*high*	temperature	6	*low*		1	*short*
	1	*much*	size	11	*high*		5	*high*		1	*low*
frequency	10	*many*		10	*much*		2	*much*		1	*old*
	2	*much*		9	*small*		1	*large*	weight	5	*much*
	1	*infrequently*		9	*long*	time	97	*early*		2	*low*
number	107	*many*		3	*large*		46	*long*		1	*many*
	8	*high*		3	*little*		26	*little*			

[1] meaning of value; [2] frequency; [3] parameter

4.5. Collostructional analysis (collostruction strength)

4.5.1. Theoretical background

As previously noted, this study adopts two different analysis types: raw frequency and collostructional. Here, collostructional analysis provides evidence that there is a prototypical meaning of a degree equative construction by measuring the collostructional strength between the lexeme (or a word) and a given construction. Collostrutional analysis is basically intended to investigate the interactive relationship of lexemes and the grammatical structures associated with them by measuring the degree of strength of attraction or repulsion that a word exhibits with respect to a given construction. This approach enables us to identify words that appear more frequently than expected in a given construction. The measure of the strength of attraction or repulsion is usually performed employing the log-transformed p value of Fisher's exact test, which uses the most precise statistics. This analysis employs Fisher's exact test because this test does not make unwarranted assumptions regarding data distribution, even at low frequencies. More precisely, this method uses the p value established by the test to measure collostruction strength (i.e., a word's strength of attraction/repulsion with respect to a construction). This p value is smaller than the smallest value that non-professional computer programs will output.

It is widely agreed that the linguistic context of a given word offers important clues regarding its structural and meaning properties. It is thus important to investigate this context by extracting its collocates and focusing on the syntactic and semantic structures in which words occur to explain the dependencies and interactions between a word and its grammatical constructions (Stefanowitsch & Gries 2003).

When investigating the correlation between a word and a particular grammatical structure, researchers typically focus on the preferences or restrictions connected with a word in a given structure. Earlier researchers in corpus-based analysis used the raw frequencies of the data collected from corpora, providing their ranking order. However, the simple ranking-ordering frequency of collocates disregards the complexity and overall distribution of the data. That is, since a given word can have a higher overall frequency than others, the word will have a higher general probability of occurrence, which means that this higher frequency is unlikely to be among the word's properties. According to Stefanowitsch and Gries (2003), analysis based on raw frequencies faces another disadvantage in that it lacks the ability to create a quantitative assessment of the association strength between a word and its construction. In contrast, collostructional analysis assumes that if grammatical structures are regarded as signs in the same way that words are, then their association with words can be investigated in the same way as associations between words. In this way, collostructional analysis pays closer attention to grammatical structure than any previous approach.

4.5.2. Analysis

To clarify the meaning of degree equative constructions, this study calculates the association strength between the parameters and the degree equative constructions because the parameter indicates the properties in terms of which entities are compared in a given construction. The study calculates the association strength of a given word functioning as a parameter for a given structure consisting of target of comparison, parameter marker, parameter, standard marker, and standard of comparison. Based on the association strength information, Fisher's exact test is used to compute the probability of these distributions. Table 7 shows the collostruction strength ranking, which can be determined by sorting by their p value. The list of top-ranked collexemes provides an essential clue regarding why certain parameters are thought of as inherently degree equative constructions. For instance, the p value

of the parameter *large* is 273.9362597, indicating that the association between *large* and degree equative construction is extremely strong. This table lists the thirty-two parameters most strongly associated with the degree equative construction. The parameters most strongly associated with the construction are *early, far, few, high, late, little, long, low, many, much, recently, small, young,* all of whose p values are infinite, and thus, these parameters can be regarded as forming a group. The meaning derived from these thirteen parameters is a good candidate for the prototypical meaning, that is the most strongly fixed or established meaning.

Table 7. Strongest collexemes in degree equative constructions

No.	Parameter	Coll. Strength	No.	Parameter	Coll.Strength
1	*early*	Inf	17	*short*	132.7691937
2	*far*	Inf	18	*deep*	125.6807726
3	*few*	Inf	19	*old*	119.3122516
4	*high*	Inf	20	*fast*	116.9286983
5	*late*	Inf	21	*tall*	90.76237615
6	*little*	Inf	22	*wide*	52.32510417
7	*long*	Inf	23	*easy*	31.44318877
8	*low*	Inf	24	*thin*	24.70514244
9	*many*	Inf	25	*simple*	18.30398876
10	*much*	Inf	26	*shallow*	16.98687925
11	*recently*	Inf	27	*quickly*	16.17816508
12	*small*	Inf	28	*strong*	14.05833519
13	*young*	Inf	29	*great*	13.39411519
14	*large*	273.9362597	30	*fine*	2.917920039
15	*soon*	156.7135649	31	*near*	2.450207109
16	*close*	156.3976376	32	*infrequently*	1.647554502

As easily noted, it would be hard to determine the prototypical meaning from these thirteen parameters used in this construction because there are too many parameters in the single top position and thus, the additional meaning that these parameters denote in the construction is required. Therefore, this study tries to interpret what these parameters indicate in the context in which they are used.

Table 8 presents the references extracted from the thirteen parameters, whose meanings are prototypically interpreted as time, distance, number, amount, size, and age, rather than speed, weight, ratio, and score.

Table 8. Meanings of top-ranked parameters

No.	Parameter	Meaning of value	No.	Parameter	Meaning of value
1	*early*	time	8	*low*	amount/ number
2	*far*	distance/ time	9	*many*	number
3	*few*	number/ time	10	*much*	amount/ number/ time
4	*high*	amount/ number/ distance	11	*recently*	time
5	*late*	time	12	*small*	size
6	*little*	time/ number/ distance	13	*young*	age
7	*long*	time/ distance			

In this construction, the parameter *few*, for instance, can indicate the number of people, as in (19a), or a specified period, as in (19b). Similarly, the parameter *little* expresses a short duration, as in (19c) while indicating a short distance in (19d). In addition, the parameter *much* refers to a large amount of snow in (19e) but interestingly indicates the number of people, as in (19f) and, similarly (19a).

(19) a. They can still book passage on cargo ships that carry as few as two passengers. (COCA NEWS 1998)
b. Each well is expected to generate about $16 million during its lifetime, which can be as few as ten years, according to the Pennsylvania Budget and Policy Center. (COCA 2012 BLOG)
c. The entire process could be completed in as little as two hours. (COCA 2011 ACAD)
d. Then, the scientists scanned each of the 200 or so bones to create computer models that have data points spaced as little as 0.1 millimeter apart, says Chapman. (COCA 2000 MAG)
e. And today as much as six inches of snow is expected in the Upper Midwest. (COCA 2013 SPOK)
f. The population is estimated to have grown to as much as 15 million in 2002, from 25,000 in 1866 and 230,000 in 1950. (COCA 2008 ACAD)

The results of this study show that degree equative constructions provide information on time, distance, number, amount, size, and age for the entities in the position of the target of the parameter, which are evaluated or measured, along with their exact value on a scale.

5. Results and Implications

5.1. Interpretation of degree equative constructions

As suggested by the previous sections, a degree equative construction contains an implicit standard of comparison. A similar fact is concerned in the following equative sentences. The sentences in (20) compare two features possessed by one entity. The target of comparison and the standard of comparison are inseparable. Thus, the standard of comparison can be viewed as implicit in the sense that the sentence in (20a) compares the depth and width of the swimming-pool. According to Huddleston and Pullum (2002), this sentence can be interpreted as "the pool is *x* units deep and the pool is *y* units wide. The variables *x* and *y* here are equal in degree." The example in (20b) indicates that the second clause should necessarily have one empty element.

(20) a. The swimming-pool is as deep as it is wide. (Huddleston, 2002)
b. The swimming-pool is as deep as it is (*quite/ two meters) wide.

Similarly to Huddleston and Pullum (2002), this study attempts to interpret the degree equative construction. The sentence in (21a) can be interpreted as "the diameter was estimated to be large to the same degree that it is 10 kilometers", considering that the target of comparison is *the diameter of the progenitor nucleus,* the parameter is *large*, and its exact value is *10 kilometers*. Example (21b) means "the people were many to the same degree that they are 100 people", while (21c) denotes "the rock is much to the same degree that it is 90 percent."

(21) a. Before Comet Shoemaker-Levy 9 cascaded into Jupiter, the diameter of the progenitor nucleus was estimated to be as large as 10 kilometers. (COCA 1996 MAG)
b. After weeks of rising tension in eastern Zaire, as many as 100 people

were killed in fighting among local tribesmen, Rwandan refugees, and Zairian soldiers, sources say. (COCA 1995 NEWS)

c. This vanishing act is far slower than the constant building up; still, as much as 90 percent of the rock eventually dissipates into the waters, forming sand. (COCA 2011 MAG)

This way of interpretation eventually leads to an alternative to regard degree equative constructions as a type of the reduced clauses of the comparative clause. The interpretation of the underlined parts in (22) corresponds to (23). The target of comparison in (22a) is *people*, the parameter is *many*, and the value is *100*, whereas the target of comparison in (22b) is *profit margins*, the parameter is *high*, and the value is *40 percent*.

(22) a. As many as 100 people were killed.
b. Food lines have profit margins of as high as 40 percent.
c. Kids as young as 5 years old whizzed down the tracks.
d. In summer, as much as 18 hours of sunlight a day allows pumpkins to reach their ultimate potential. (COCA 2011 MAG)

(23) a. The people are many to the same degree that it is 100.
b. Profit margins are high to the same degree that it is 40 percent.
c. Kids are young to the same degree that it is 5 years old.
d. Sunlight is much to the same degree that it is 18 hours.

5.2. Syntactic structures of degree equative constructions

This study discusses the syntactic structures of degree equative constructions while considering the results derived from the frequency analysis and collostructional analysis. The structures of regular equative and comparative constructions are illustrated in (24) and (25), as mentioned at the beginning of this study. The order of each element seems to be fixed, thereby implying that the elements occupying each position play particular grammatical roles.

(24)	*He is*	*more*	*clever*	*than*	*his brother*
	Target of comparison	Parameter marker	Parameter	Standard marker	Standard of comparison

(25)	*Jill is*	*as*	*clever*	*as*	*Liz*
	Target of comparison	Parameter marker	Parameter	Standard marker	Standard of comparison

Unlike these regular comparative structures, degree equative constructions have a rather flexible structure, which is confirmed by the four different types in terms of their distribution, (as examined in detail in Section 4.2.1). The examples in (27) show the distribution of the four types, which enables us to make comparisons with the regular comparatives in (24) and (25). The example in (27a) exhibits a structure similar to that of a regular comparative. However, its frequency is only 9.8 percent of total frequency. The most conspicuous example would be the case when the target of comparison occurs in the last position, which cannot be found in any other comparatives.

(26) a. Consider that the dropout rate in these districts may be as high as 50 percent. (COCA 1991 ACAD)
b. Temperatures as warm as 50 in the winter don't seem to harm them. (COCA 1992 MAG)
c. It allows work permits and prevents deportation for as many as 1.4 million undocumented immigrants not more than 30 who were brought to the United States as children. (COCA 2012 WEB)
d. In the mid-1980s many auto makers demonstrated "concept cars" that would carry four or five passengers but weighed as little as 1,000 pounds. (COCA 1995 MAG)

(27) a. *The rate may be* *as* *high* *as* *50 percent*
Target of comparison Parameter marker Parameter Standard marker Standard of comparison
b. *Temperatures (of)* *as* *warm* *as* *50*
Target of comparison Parameter marker Parameter Standard marker Standard of comparison
c. *as* *many* *as* *1.4 million (of)* *undocumented immigrants*
Parameter marker Parameter Standard marker Standard of comparison Target of comparison

d. *concept cars weighed*	*as*	*little*	
Target of comparison	Parameter marker	Parameter	
as	*1,000 pounds*		
Standard marker	Standard of comparison		

From the distributional properties of these four types, we can directly observe that the sequence of "as high as 50 percent", consisting of a parameter marker, parameter, standard marker, and standard of comparison, behaves as one constituent, whose category seems to be a noun phrase in the sense that this sequence occupies the position in which a regular noun phrase can occur in a sentence. More specifically, this unit appears in the predicative complement position in (27a), is preceded by a preposition in (27b), is followed by a preposition in (27c), and is preceded by a verb in (27d).

If we assume the sequence "as high as 50 percent" is a noun phrase, we must inspect the internal structure of the sequence. The key item in this sequence is the element in the position of the standard of comparison. This assumption is supported by the fact that certain degree equative constructions include a parameter irrelevant to the target of the parameter, as in (28). Degree equative constructions can typically be interpreted as a sentence type in which the target of comparison is associated with either the parameter or the standard of comparison. Specifically, the sentence in (27a) can be paraphrased as "the rate may be high as well as the rate may be 50 percent." The sentences in (28), however, cannot be rephrased as "the size is much as well as the size is 10 percent of US GDP" (28a) or "the margin could be few, and the margin is two or three votes" (28b).

(28) a. The size of this economy has been estimated to be as much as 10 percent of U.S. GDP. (COCA 1999 ACAD)
b. The margin could be as few as two or three votes. (COCA 2001 SPOK)

In terms of these interpretations, degree equative constructions can also be classified as a type of ellipsis construction different from regular comparatives. For instance, the standard of comparison ***six*** in degree equative construction example (29a) can be interpreted as "children is six", whereas the standard of comparison ***we were 25 years ago*** in the regular equative sentence of example (29b) may be rephrased as "we were young 25 years ago." More specifically, a degree equative construction has the target of comparison as its recoverable element, while in a

regular equative sentence, the deleted element corresponds to the parameter. The element in the position of the standard of comparison seems to function as another parameter in this degree equative construction, but not as a standard of comparison identical to that of regular comparatives.

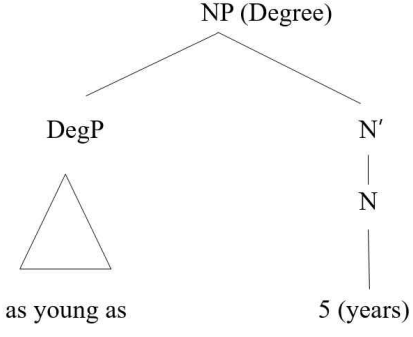
(29) a. In Michigan, children as young as six have been found laboring in blueberry groves. (COCA 2012 BLOG)
b. But then, none of us is as young as we were 25 years ago. (COCA 2012 BLOG)

Regarding the grammatical functions of degree equative constructions, this sequence seems to play the role of an adjective since this sequence can be used as a complement in the position of a predicative complement, the position preceded by a preposition, and a modifier in attributive positions.

Based on these grammatical properties, this study argues that degree equative constructions possess a mismatch feature such that the syntactic category of the sequence is a noun phrase, implying that the standard of comparison is prominent. However, its parameter is an adjective, similar to the case with regular comparatives. If we bear these properties in mind, the structure of this sequence can be depicted as in (30) from the perspective of construction grammar. This sequence behaves as a noun phrase with a degree equivalent to 5 years, whose specifier specifies the degree of this value.

(30) a. Tiggemann (2003) found that, on average, girls as young as 5 years already desired a thinner body than their current figure. (COCA 2012 BLOG)

b.



5.3. General characteristics of degree equative constructions

This section addresses the five characteristics of the degree equative constructions focusing on the results from frequency-based analysis that this study has investigated thus far. First, as a result of searching for the parameters that are used in equative constructions, this study reaches two conclusions. First, the total number of parameters was 33. This result tentatively implies that equative constructions are much more frequently used to measure (or evaluate) the quantity of something (the comparee). In addition, the results show that there may not be any restriction on the distribution of parameters. Second, this study identified four different types of degree equative construction in terms of the relation between the target of comparison and three other elements: premodificational, postmodificational, predicative, and adverbial. Focusing on these four types, this study achieves insight regarding constituency, by examining the internal structure of the equative construction: the four elements of parameter marker, parameter, standard marker, and standard must be a single constituent.

Regarding whether there is a relationship between parameter and equative construction type, the parameter *early* is used exclusively as an adverbial (99 percent of total frequency), whereas the parameter *young* primarily performs postmodificational role (97 percent of total frequency). Based on this finding, we can claim there must be a correlation between parameters and their functions. Next, the study sought to determine what a numerical value in the standard position signifies, thereby verifying the interpretation of these values. Among the 10 referential meanings derived from such numerical values, the top-ranked item was number, accounting for 34.2% of the total frequency, followed by time, amount, and size.

Last, to determine the meaning of degree equative constructions, this study calculated the association strength between the parameters and such constructions. The result indicates that the meaning derived from the thirteen parameters is a good sign of the prototypical meaning that is most strongly fixed.

6. Conclusion

This study investigated English degree equative constructions in an effort to identify their grammatical characteristics and describe the circumstances in which

these constructions are used by carefully examining their syntactic and semantic properties. To this end, two different analytical approaches were adopted: raw frequency and collostructional analyses, both applied to corpus data. First, the study investigated the distributional properties of the parameter to identify which properties degree equative constructions are used to compare. The total number of parameters used in this construction type was 33, an unexpectedly small number of degree words. Two such parameters (i.e., *many* and *much*) predominated with respect to use frequency, corresponding to nearly 50% of such occurrences. This result is similar to that found through collostructional analysis, thus confirming that this construction is used to assess the degree of something in quality and quantity. In addition, based on an investigation of the internal structure of degree equative constructions, the study identified four different syntactic distributions in which the target of comparison can appear. In terms of the relation between the target of comparison and three other elements, the study classified these distributions into 4 types of degree equative constructions: premodificational, postmodificational, predicative, and adverbial. Based on these results, this study analyzed the internal structure of this construction.

To explain the meaning of degree equative constructions, this study used collostructional analysis and calculated the association strength between the parameters and the degree equative constructions. The parameters most strongly associated with the construction were *early, far, few, high, late, little, long, low, many, much, recently, small, young*, all of whose collostruction strength values were infinite. Thus, these parameters can be regarding as forming a group. It is not easy to determine the prototypical meaning of such constructions from these parameters. Therefore, the study attempted to interpret what these parameters indicate from the context in which they were used. The parameters could be prototypically interpreted as time, distance, number, amount, size, and age, rather than speed, weight, ratio, and score. Based on these interpretations, the study proposes that the comparative clause should be regarded as a reduced clause, thereby giving the cluster "*as* plus standard of comparison" a clausal interpretation.

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