

# A Cognitive Approach to the Symmetry and Asymmetry in “Up/Down+X” Compounds

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## ABSTRACT

Symmetry and Asymmetry are two fascinating linguistic phenomena, especially within a pair of compounds with directional morphemes like “up+X” compounds and “down+X” compounds. This paper will systematically study the features of forms and meanings of top 100 frequently used “up+X” compounds and “down+X” compounds which are singled out from COCA corpus and meanwhile probes deeper into the formation mechanisms of the characteristics of symmetry and asymmetry of them in terms of cognitive semantics. This study suggests that these 100 pairs of “up+X” compounds and “down+X” compounds represent three features in forms and meanings: full symmetry, partial symmetry, and full asymmetry. In addition, the roles of the directional morphemes up and down in these pairs of “up/down+X” compounds with full symmetry, partial symmetry and full asymmetry differ from each other. This paper concludes that cognitive strategies have an important function in these phenomena, and furthermore human’s embodied experience are equally essential to these features.

**Keywords:** “Up/down+X” compounds, symmetry, asymmetry, cognitive semantics, COCA corpus

## 1. INTRODUCTION

Symmetry and asymmetry, known as two common and fascinating phenomena in our everyday life, refer to whether two things are one to one correspondence. These phenomena also exist in human language, of which a pair of compounds with directional morphemes such as “up/down+X” compounds is one representative sample. So-called “up/down+X” compounds are the combinations of spatial morph up or down with a morph X, for instance *upward* and *downward*. Compound is usually regarded as one of the oldest methods of word formations [1][2]. Dressler [3] claims compound is the most common way of word-formation of complex words, hence the compounds are the widespread phenomena in human language. The significance and importance of compounds in human language attract linguists and scholars’ great interest. Traditional linguists concentrate more on the forms of compounds. Bloomfield [4] divides the compounds into three types: syntactic compounds, asyntactic compounds, and semi-syntactic compounds. Wang Xijie [5] analyzes not only the deep and surface structures of the compounds in order to find the relations between the two constructions, but also elaborates the semantic features of them. The studies mentioned above focus on the forms and meanings in terms of language itself. Nevertheless, they do not give a proper explanation of the nature of compounds. The cognitive linguists provide a new approach to the study of compounds. Wan Lanqin [6] studies the cognitive motivation of N+N compound formations in English and Chinese from the perspective of lexical concepts and cognitive models (LCCM). Hou Xiaohua and Wang Bin

[7] account for the meaning constructions of compounds in light of conceptual blending theory and cognitive strategies in conceptual blending processes. Zhou Xianwu [8] studies the semantic parataxis of English N+N compounds in the light of frame semantics theory. Wang Zhijuan and Peng Xuan [9] give a complete description and illustration of the compounds in English finding that there are 32 types of conceptual metaphor in English compounds and revealing the process of meaning construction of compounds. The scholars listed above study compounds from a theoretical point of view. However the learning conditions of compounds are neglected. Miller [10] points out the complex features of English compounds pose great difficulties for learners of English as a foreign language. For this reason, many scholars begin to carry out empirical approaches to the study of compounds. Chen Changyong and Wang Linlu [11] investigate the obedience of English compounds by Chinese English learners concluding that Chinese-speaking students always reduce using English compounds unconsciously in translations, especially those exocentric compounds, which may be caused by not only difference between Chinese and English but also the complex semantic features of compounds. As we can see, most of present studies concentrate on the structural and semantic features and even the classification of general compounds from different point of view, but few studies show the features of different types of specific compounds. And even fewer show the relations between two compounds with directional morphemes. In this study, we attempt to explore the symmetry and asymmetry of “up/down+X” compounds selected from Corpus of Contemporary American English

(coca) and illustrate systematically the formation mechanism of symmetry and asymmetry of “up/down+X” compounds from the perspective of cognitive semantics in the hope of providing guidance or a new perspective for the teaching of English as second language.

## 2. Methods and Materials

In this study, we attempt to explore the symmetry and asymmetry of “up/down+X” compounds selected from Corpus of Contemporary American English (coca) and illustrate systematically the formation mechanism of symmetry and asymmetry of “up/down+X” compounds from the perspective of cognitive semantics in the hope of providing guidance or a new perspective for the teaching of English as second language.

The language data in this study are collected from Corpus of Contemporary American English, the largest and balanced freely available corpus up to date. According to the retrieval discipline of corpus, the string up\*was input as the first step to search and single out the primary forms of top 100 high-frequency compounds with the morph up. Then we got the “down+X” compounds corresponding to “up+X” compounds. At last, the 100 pairs of high-frequency “up+X” compounds and “down +X” compounds are manually classified.

The top 100 high-frequency “up+X” compounds and “down+X” compounds are classified into three types: full symmetry, partial symmetry, and full asymmetry according to the features of their forms and meanings.

The full symmetry refers to that “up+X” and “down+X” compounds are symmetrical in both forms and meanings. Now take a typical example, say the form *upstairs* and *downstairs*, whose semantics are listed as follows.

The cat belongs to the people who lives *upstairs*.  
She rushed *downstairs* and burst into the kitchen.

The partial symmetry means that forms of “up+X” and “down+X” compounds are symmetrical but the meanings are not wholly symmetrical. For example, the forms and semantic representations of *uphill* and *downhill* are specially illustrated by the sentence in the following. There are two various meanings of the compound *uphill*. In contrast, the compound *downhill* possesses only one meaning.

The last part of the race is all *uphill*.

It has been an *uphill* battle to achieve what she had wanted.

He headed *downhill* toward the river.

The full asymmetrical feature denotes that the meanings and forms of “up+X” compounds and “down+X” compounds are both asymmetrical, for example, when we say or write compounds *uplift*, *upsurge* and *uptake*, the hearer can understand, but *downlift*, *downsurge* and *downtake* seem to be abnormal. In other words, compounds *downlift*, *downsurge* and *downtake* are not a linguistic symbol.

## 3. COGNITIVE ANALYSIS OF ASYMMETRY AND ASYMMETRY OF “UP+X” AND “DOWN+X” COMPOUNDS

As Li Wenli [12] claims, the words expressing spatial concepts such as *up* and *down* in English are symmetrical in both meanings and forms. They denote “towards or in an higher position” and “towards or in an lower position” respectively but the compounds composed of them have complex features. Admittedly, “up+X” compounds and “down+X” compounds are mostly symmetrical in the forms. As it seems, the focal and extensional meanings of up and down are also symmetrical, but in fact they are not always symmetrical. In the ensuing parts, the reasons of the complicate phenomena will be analyzed from cognitive stance.

In the words of Zhou [13], spatial concept which is derived from their embodied experience is one of the earliest human cognitive fruits. As a living creature, human always partitions their bodies into different dimensions of space, such as “*up*”, “*down*”, “*front*”, “*back*” and so on. As it seems, this binary division makes spacial concepts symmetrical, which, however, did not show the nature of them. In fact every part of human body is asymmetrical. Concerning focal meanings of up and down, human body has superficially up part and down part, but functionally the up part plays a more important part than that of the down part. The first reason is that the main organs are in the up part of the body. The second factor of the functional difference of the two parts is that the area of the up part of human’s body is wider than the down one. Therefore it is not surprising that up part more easily becomes the focal point of attention and perception. According to Li Wenli [12], the spacial meaning of *up* and *down* is symmetrical, *up* is the opposite side of *down* and *down* is also the antonym of *up*. But when spacial domain of *up* or *down* is mapped into the other domain, the symmetrical phenomena emerges. The asymmetry and symmetry of “up+X” compounds and “down+X” compounds are not only related to the meaning of *up* and *down* but also concerned with the blending processes of compounds as a whole.

The conceptual blending theory is first proposed by Fauconnier and Turner [14], including four mental space and the conceptual blending processes. The four mental spaces make up of two input spaces, one generic space and one blended space. And the conceptual blending process includes integration, completion and elaboration. Integration is always involved when conceptual content from two or more mental spaces is fused in the blended space. completion is required to understand the blend. Elaboration is envisaged in a highly dynamic fashion and or to put it the other way round the concepts constructed in the blend are mentally unfold and taken through stages like a computer program being tested for correctness and consistency [15]. Several year later, the conceptual blending theory is developed by Evans [16] who puts forward the theory of lexical concepts and cognitive models (LCCM theory). As he suggests, composition

involves two processes, termed selection and fusion. The process in which linguistic or extra-linguistic context selects for a particular lexical concept. Selecting the 'correct' lexical concept is required by fusion, the operation in which lexical concepts are integrated and the resulting integration are interpreted. Fusion concerns the process in which selected lexical concepts are composed such that they give rise to a particular conception. Fusion involves two component processes: integration and interpretation. Integration is the same as composition, and the process of interpretation is similar to the completion and elaboration. In final, this conceptual blending theory can only be accessible when the two input spaces conform to the vital relation such as the identity relation between the two input spaces in the case of metaphor. Each of "up+X" compounds and "down+X" compounds are addressed below:

### **3.1. Fully symmetrical compounds**

In these compounds, when morphemes up and down concerning spatial concepts refer to "towards and on a higher or lower place", up and down are symmetrical in lexical semantics. In the operation of meaning-constructions, on the basis of theory of lexical concepts and cognitive models, the mental space associated with spatial concept of up or down is selected and meanwhile the mental space relating to another morpheme X is also singled out. Then they are projected into the blending space. After that, the blending space undergoes interpretation during which the blend can be enriched by information deemed necessary, pertinent or even just interesting. In the final, the forms upstairs and downstairs and novel meanings of them appear in language. As we have seen, during the conceptual blending process of compounds upstairs and downstairs, morpheme up referring to spatial concept plays a main role in the meaning of compound upstairs denoting "towards higher position". Similarly the morpheme down also has a decisive function in the compound downstairs. And the morpheme stairs in the two compounds upstairs and downstairs has no directional quality.

In addition, the compounds upstate and downstate are also blended in a similar process to the compounds upstairs and downstairs. Nevertheless understanding the compounds upstate and downstate needs a lot of relevant geographical encyclopedic knowledge. In the main English-speaking countries' maps, north is in the up part and south is in the down part. Therefore, the compounds upstate and downstate normally refer to "in or to a part of a state that is far from its main cities, especially a northern part" and "in or to a part of a state remote from its large cities, especially the southern part" respectively.

Similarly, in the compounds upstage and downstage, the morphemes up and down both have the spatial concepts. And the mental domain up or down and the domain stage are integrated into a blend upstage or downstage. In the process of interpretation, the reader will call up their knowledge of the platform of the theatre in England in the 1850s, in the back of which there are many steps. Therefore the back of the stage is higher than the front of the stage. Consequently,

the compound upstage can be understood as "act or towards the back of the stage in a theatre" and the compound downstage means "act or towards the front of the stage in a theatre".

Expect the spatial concepts, morphemes up and down possess metaphorical meanings as well. In this section, the metaphorical meanings concerning social status will be specified. Based on what Lakoff and Johnson [17] called orientational metaphor which organizes a whole system of concepts with respect to one another, giving a concept a spatial orientation, for example, HAPPY IS UP, the spatial domain can be projected into the social status domain, which can be represented by the formula HIGH STATUS IS UP and LOW STATUS IS DOWN. The social and physical basis is that social status or (social) is correlation with spatial words up and down, that is to say, high social status or more powers is up and on the contrary low social status is down. In compounds uptown and downtown, the morpheme up is used to denote important and rich place, in contrast to which down is related to unimportant and business area. So the mental space of spatial morpheme up or down and another morpheme town referring to "a place with many houses, shops/stores where people live and work" are integrated into a blend space containing uptown and downtown separately. In the process of completion and elaboration, the readers need to recall their knowledge that in developed English-speaking countries, most of the riches live in the countryside and reversely the business buildings are built in the center of town. So the compound uptown has the meaning of "in or to the parts of a town or city that are away from the center, where people live" and the compound downtown can be understood as "in or towards the center of a city, especially its main business area".

According to the theory of conceptual metaphor, on account of the physical basis that humans and most other mammals sleep lying down and stand up when they awaken, there exist metaphors CONSCIOUS IS UP and UNCONSCIOUS IS DOWN in English language. Therefore in the compounds uptime and downtime, the spatial domains of up and down are mapped into the corresponding state domain. Then the input space of up or down and the input domain of time are integrated into the blended domain. Finally, the blended domain of uptime and the blended space downtime go through the process of interpretation, gaining the meanings "work of the computer" and "out of work of computer" in respective.

If you add more substance or physical objects to a container or pile, the level goes up and on the contrary the level goes down. When spatial concepts up and down are mapped into quantitative domain, we can say MORE IS UP and LESS IS DOWN. In the compounds upsize and downsize, the mental space of up or down and mental space of size are integrated into a blend space. And then the blend space of upsize or downsize is interpreted as "increase the size, extent, or complexity" and "to reduce the number of people who work in a company, business etc. in order to reduce costs" on the

basis of readers' relevant knowledge.

Summing up, In this genre of “up+X” compounds and “down+X” compounds, the morphemes up and down have not only spatial meanings but also metaphorical meanings. The spatial domain of up and the spatial domain of down can both be mapped into another same domain simultaneously. In addition, they play a decisive role in the meaning of the compound as a whole.

### **3.2. Partially symmetrical compounds**

These “up+X” compounds and “down+X” compounds are not fully symmetrical. These pairs of “up+X” compounds and “down +X” compounds are fairly complicated in that “up+X” compounds and “down+X” compounds are symmetrical in forms but not entirely symmetrical in the semantic representation. To take an example from compounds upright and downright, as it seems, it is considerably easy to mistake the two compounds as a pair of symmetrical ones. In reality, the compound upright is not corresponding to compound downright in semantics.

In terms of conceptual metaphor theory, there are VIRTUE IS UP and DEPREDITY IS DOWN in English metaphor. Besides, there are also the formula GOOD IS UP and BAD IS DOWN in metaphorical language. In the compound upright, the morpheme up can possess the spatial concepts and the spatial domain of up can also be projected into the state domain, meaning the high moral characters of a person. Whereas the morpheme down in the compound downright can solely be mapped into the state domain concerning the bad state of something. And afterwards the mental space of morpheme up and the mental space of morpheme right are integrated into a blend of upright. In the process of interpretation of the compound upright, the two meanings “(of a person)not lying down, and with the back straight rather than bent” and “(of a person)behaving in a moral and honest way” come into being. And meanwhile the mental scopes of down and right are blended into the blend downright and then the blend goes through the process of interpretation, yielding the meaning “used as a way of emphasizing something negative or unpleasant”.

In the same manner, the morphemes up and down in compounds upward and downward are also projected into different domains. The morpheme up has the spatial concepts and the spatial concepts up is also mapped into the economic domain, but the morpheme down only has spatial domain. It is these difference that leads to the gap between the meanings of compounds upward and downward.

In another case, the morpheme up and down in compounds uphill and downhill both has solely the spatial concepts. And the mental space of up or down and the mental space of hill are integrated into the blended space which goes through the process of completion and elaboration, producing the meaning “sloping upwards” and “towards the bottom of a hill” respectively. Besides, not only does the interpretation process of the compound uphill produce the meaning “sloping upwards”, it also gives rise to the meaning “an argument or a struggle that is difficult to win and takes a lot of efforts over a long period of time”. The reason why the

second meaning emerges is the physical basis of “when people go upward the hill, they will feel exhausted”. As a consequence, when the input space of uphill and the input space of an argument or struggle are integrated into the blend which undergoes the process of interpretation, producing “an argument or a struggle that is difficult to win and takes a lot of efforts over a long period of time”.

In sum, these kinds of compounds are a little complex. They seem to be (not really) symmetrical in that they have the symmetrical forms, but in fact they are not always symmetrical in meanings due to the different meanings of up and down. The first reason of this phenomenon is that the morpheme up and down are projected into different domains in respective, producing different meanings. Moreover it is indeed necessary to consider the significant importance of the encyclopedic knowledge and embodied experience of human to the symmetry in the semantic representations of “up+X” compounds and “down+X” compounds. In final, the morphemes up and down play a decisive role in the directive qualities of the whole compounds.

### **3.3. Fully asymmetry compounds**

In this kind of compounds, to some extent, it is much more prominent that the “up+X” and “down+X” compounds are often asymmetrical in both forms and meanings. When we take compounds *uplift*, *upsurge*, *uproot* and *upwell* into consideration, the morphemes *lift* which means “to raise sb/sth or be raised to a higher position or level”, *surge* denoting “to move quickly and with force in a particular direction”, *root* referring to “to grow roots; to make or encourage a plant to grow roots” and *well* meaning “to raise to the surface of sth. and start to flow” all have the sense of “towards a higher position”. According to one of the basic vital relations, these morphemes can only be integrated with spatial morpheme *up*, not *down*. In these compounds, the spatial morphemes *up* and *down* solely add the states of “the actions of moving towards a high position” and of “moving a lower position” to the compounds as a whole, that is to say, they are not the direction-determining elements of the entire compounds. In the same fashion, the morpheme *trodden* in the compound *downtrodden* can only be blended with spatial morpheme *down* owing to the morpheme *trodden* containing the meaning of “move towards a lower position”.

In surveying this type of compounds, the conclusion can be drawn that the spatial morphemes up and down do not play a decisive role in the whole compounds. The directive quality of the whole compounds and the conceptual blending process are affected by the morpheme X.

## **4. CONCLUSION**

Symmetry and asymmetry are two common and interesting phenomena in our language, especially in a pair of compounds with morpheme up and compounds with morpheme down. The previous studies pay more attention to the forms and meanings of compounds regardless of the comparison between a pair of

compounds with directional morphemes. This study investigates the asymmetrical and asymmetrical qualities of top 100 high-frequency “up+X” compounds and “down+X” compounds selected from coca corpus in both forms and meanings, finding that there are full symmetry, partial symmetry and full asymmetry in “up+X” compounds and “down+X” compounds. In addition, this study also explains the reasons of emergence of the symmetrical and asymmetrical qualities of them deeper on the basis of cognitive semantics. In the fully symmetrical “up+X” compounds and “down+X” compounds, the spatial morpheme *up* and *down* play crucial roles of the directive quality of the whole compounds and meanwhile the morpheme X does not possess the directive quality. In the partially symmetrical “up+X” compounds and “down+X” compounds, the spatial morpheme *up* and *down* are projected into different domain in the process of metaphorical projection, therefore bearing different metaphorical meanings. And besides in this kind of compounds, the encyclopedic knowledge and embodied experience are also of importance in the conceptual blending process. In the fully asymmetrical “up+X” compounds and “down+X” compounds, the morphemes X have obviously qualities of direction and play important part in the whole compounds.

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