The Gravitational Model of Language Availability and Interpreting: A Critical Review

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Abstract

Due to the use of extensive technical terminology and words in conferences, interpreters often struggle with lexical selection, both in comprehending and retrieving lexical items from long-term memory for speech production (Gile,1990a; Pochhacker, 2008). Hence, the Gravitational Model of lexical availability was developed by Gile (2009) to represent certain rules available to interpreters for active use of lexical items at a given point in time. By placing great emphasis on time pressure during the interpreting process, Gile's Gravitational Model posits that lexical items used occasionally by the interpreters require a significant amount of processing to be highly available for active use. In this regard, under the tenets of the Gravitational Model, the researcher, in this study, reviews certain guidelines and strategies that enhance lexical availability among interpreter trainees. The major implication drawn from this study is that the rules of written language contrast with those of spoken language. That is to say, lexical items are not stimulated equally in the oral and written systems, relying on their frequency in written and spoken language systems. Moreover, this study also highlights the fact that different lexical items have different levels of availability for interpreters, ranging from those words that can be retrieved instantly and effortlessly from long-term memory to those lexical items that are unavailable at a given moment. Collectively, based on the paradigms of the Gravitational Model, the researcher suggests certain specific guidelines and principles for lexical preparation.

Keywords: Gravitational Model, interpreting, saturation

1. Introduction

Directionality in interpreting is normally defined as the direction in which interpreting occurs. Interpreters are able to express themselves

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more fluently in some languages than in others (Pochhacker, 2004, 2008). Interpreters' active language refers to the language they can speak with fluency, whereas their passive language refers to the language they can understand but normally they do not use it fluently (Keiser, 1978). In terms of interpreters' active and passive languages, the International Association of Conference Interpreters (AIIC) (2012) distinguishes among A, B, and C languages. A language is the interpreter's native language or the language in which the interpreter has the highest fluency and this is the language into which interpreting takes place. B language is considered as the interpreter's second language as he or she can communicate with it fluently, but it cannot be considered as the interpreter's native language. Also, C language is the interpreter's passive language from which he or she performs interpretation (Keiser, 1978; Michael et al, 2001). That is to say, the interpreter comprehends messages in C language and can render them in his A or B language (Pochhacker, 2004). In interpreting, much confusion derives from this issue that interpreters work into their A language from their B and C language or the other way round. Many interpreter trainers provide their interpreting students with plenty of language-enhancement training to benefit from diverse strategies to perfect their skills. Hence, the successful use of strategies by students can be of great assistance to interpreter trainees. In this regard, the Gravitational Model of language availability is a perfect tool for analyzing such strategies. Gile's Gravitational Model makes interpreter trainees understand the fact that language availability is not static as availability increases with constant stimulation and decreases when language constituents are not used. Hence, interpreter trainees can enhance their language constituent availability when it is insufficient in their working language, and also it is important to improve their working languages.

2. Language Availability

This is really important to clarify the concept of language availability in comprehension and production. The major dimension of linguistic knowledge is the availability of lexical units, including idioms, specialized terminology, and grammatical, stylistic, and pragmatic rules. That is to say, lower availability of language items is viewed as a lack of knowledge (MacDonald, 1997). Language availability is easy to observe when a particular word does not come to one's mind immediately or when some conscious effort is necessary to decide how to finish a sentence (Eyseneck & Keane, 1990; Tulving, et al., 1982). Language availability is also an important concept in language comprehension (de Groot, 2015).

Language comprehension involves sound and visual signals that are perceived through sensory memory. Then, the perceived signals will be directed towards the working memory to create meaning and the process of working is not automatic. Hence, this can be drawn that language availability in speech production and comprehension is of great significance in communication (Lederer, 2007; Pochhacker, 2004).

3. The Structure of the Gravitational Model Language Availability

Any language is composed of lexical units or language constituents. Lexical units are the words or idioms that frequently occur. Undoubtedly, everyone's mental lexicon varies greatly from one individual to the next. As people vary in their educational background, professional activities, and other interests, their mental lexicon also varies. Lexical units and language rules are called language constituents (Gile, 1999a). Lexical units are 'words', including technical terms, as well as idioms and compositional rules are the rules that control the way words are assembled. Normally, language constituents have diverse levels of availability, ranging from effortless retrieval from long-term memory to the tip-of-the-tongue issue in which a word is known but it is not available (Eysenck & Keane, 1990). Language constituents might be available for spoken speech, reading comprehension, and writing production (Tulving., et al 1982). The fact is that learners who do not read and write very often might have lower availability for reading comprehension and writing production than the learners who read and write a lot (Biderman & Ravazzi, 1984; Clark & Clark, 1977; Leeson, 1975; Mahmoudian, 1982).

The availability of language constituents is not a static issue but it upsurges and decreases at different rates, depending on diverse situations (Leeson, 1975; Miller, 1956). As it is stated in Gile's (2009) Gravitational Model, the availability of language constituents increases as they move away from distant orbits. In other words, centripetal or inward movement of the relevant language constituents enhances availability, and availability of the language constituents decreases by moving to orbits more remote from the central ones, which is called centrifugal migration (Miller, 1956). In terms of the availability of language constituents, if language constituents are not stimulated, they move away from the center of the system, which is called the centrifugal principle. The active stimulation in speech or writing or passive stimulation that occurs in reading or listening has a significant effect on the constituent availability. In other words, when language constituents are not used regularly, they become less available. That is why, language constituents sometimes

decrease their degree of availability even to the extent that they might be forgotten (Feng, 2002; Lin, 2004; Gile, 2009; Zhong, 2007).

As Gile (1995) points out, when language constituents are stimulated, they normally tend to move inward. When a language constituent is used by a speaker in the production of an oral speech or in a written text, it becomes more available. This movement of the language constituent into the center is faster than the centrifugal effect (Lin, 2004). That is to say, a newly learned lexical unit, through stimulation, becomes highly available in a few minutes. The higher the frequency of the stimulation of the language constituents, the stronger the centrifugal effect. Many studies (Clark & Clark, 1977; Leeson, 1975; Miller, 1956) indicate that frequently used words are understood more easily. As Zhong (2007) points out, the frequency of occurrence of a word in a language has a great impact on the time needed to reach that word in the mental lexicon. The automatic repetition without a context and without cognitive processing does not affect availability (de Groot & Christoffels, 2006). Moreover, in comparison with passive stimulation, active stimulation of language constituents has a stronger centripetal effect (Miller, 1956).

Figure 1. *Gravitational Model of Lexical Availability*
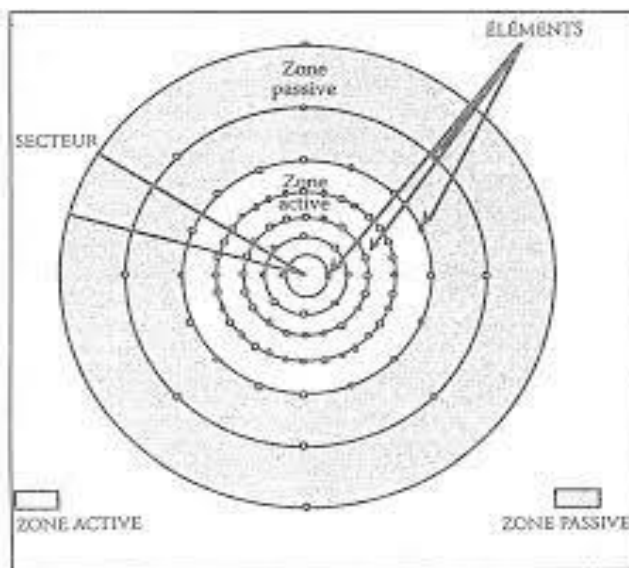
As illustrated in Figure 1, language constituents are the ones that are illustrated in small circles, moving around the nucleus. As Gile (2009) points out, the distance between an orbit and the nucleus of the Gravitational Model indicates the availability. Orbits indicate diverse

degrees of availability of the words. The more distant an orbit is from the nucleus, the more processing capacity and the more time is required to reach that word on that orbit (Gile, 2009). As Gile states, Orbits belong to active and passive zones. The active zone is located directly around the nucleus and the passive one surrounds the active zone. The active zone is made of the words that are available to the writer for text production. Nevertheless, the passive zone is not available for speech production as it is composed of words that the speaker merely understands (Tulving et al, 1982). Hence, the comprehension of the words will be easier when the orbit is closer to the active zone (de Groot & Christoffels, 2006).

Hence, the Gravitational Model indicates the availability of the language constituents. The shorter distance of the orbits to the nucleus is an indication of higher availability (Gile, 2009). Moreover, language availability has a direct link to a specific time and situation. To illustrate, interpreters who take part in a business conference experience a higher capability of knowing business terms in comparison to other contexts. That is to say, the centripetal manipulation of language constituents causes centripetal migration of other language constituents associated with it. As Miller (1956) points out, when a language constituent becomes more available, the other language constituents that sound or look similar will be activated to become more available, which is known as the escort effect (Costerman, 1980). The escort effect appears to be significant for lexical acquisition as while the initial acquisition of a particular word may take some time, the initial acquisition of other words will be much faster (Thievy, 1975). However, the translinguistic aspect of the escort effect is undeniable (Costerman, 1980; Meier, 1964; Thievy, 1975). To illustrate, when a French word is stimulated, English equivalent words, by the same token, will be available. In this situation, linguistic interference sometimes is undeniable as an interpreter might use a word incorrectly (Gile, 2009). However, most professional conference interpreters avoid the risks of linguistic interference by the power of their linguistic abilities (Thievy, 1975).

The Gravitational Model represents the status of an individual's oral or written command of a language at a particular point in time and in particular circumstances by the relative availability of lexical units. As Figure 1 shows, the Gravitational Model possesses both variable and invariable parts. As Gile (2009) argues, a nucleus shows an invariable part, and words that are gravitating around the nucleus are viewed to be the variable parts. When we talk about the words, we can refer to lexical units such as individual words and idioms and rules. Another important

issue represented in Figure 1 is orbits. Orbits indicate diverse degrees of availability of the words. That is to say, the more distant an orbit is from the nucleus, the more processing capacity and the more time is needed to reach words on that orbit. In fact, one important message carried out by Gile's Gravitational Model is that when language constituents are left without stimulation, they lose their availability until they can no longer be retrieved from long-term memory for production and they can only be recognized when used by others in texts or speeches (Thorndike & Lorge, 1994; Meier, 1964).

4. The Dynamicity of the Gravitational Model

The availability of language constituents is not a static phenomenon. Language constituents might become more available for a few seconds once it is identified in speech signals or understood in a communication (Gile, 2001; Eyseneck & Keane, 1990). Hence, under the tenets of the Gravitational Model of language availability, Gile (1999b, 2009) suggests certain rules and principles:

4.1. Rule 1: The centrifugal principle

When the language constituents are not stimulated, they normally move away from the center of the system. When a language constituent is not used actively such as being used in speech or writing, they tend to be forgotten. As Gile (2009) points out, by stimulation, we refer to active use of the language constituents in speech or writing or passive exposure to those language constituents. That is to say when the language constituents are heard or read. The centrifugal principle implies that when language constituents are not used, their availability decreases to the extent that they are considered to be forgotten. However, the speed of losing the availability of the language constituents might vary a lot. Some language constituents lose their availability faster than others. As Gile (2009) points out, some technical terms learned during preparation for a conference and some words and phrases learned while traveling abroad seem to lose availability very fast. However, some other terms are more resilient and this is because of frequent stimulation in the interpreter's environment. Moreover, the availability of language constituents can also be due to the frequent use of the related language constituents that leave strong traces in the interpreter's brain. Although there exist no quantitative assessments reported in the literature, the process of losing language constituent availability is slow. As Gile (2009) reports, it might take months or years for a word to be forgotten. A fluent speaker loses rule availability much

slower as rules are much smaller in number, and most of them are stimulated much more frequently.

4.2. Rule 2: The centripetal effect

When language constituents are stimulated or used actively or passively, they tend to move inward near the nucleus. Hence, they become more available. Through stimulation, even a newly learned lexical constituent becomes highly available within seconds or minutes. As Gile (2009) argues, with respect to terminological preparation for conferences, a fast centripetal progression is normally followed by a slow centrifugal movement. To provide a more tangible example, we can refer to an interpreter who becomes familiar with technical terms he or she has never faced before. Whereas the interpreter might forget these terms in a few days it is observed that these technical terms do not disappear completely from the language constituent system of the interpreter because when they see these terms again later at another conference, they simply recognize them.

4.3. Rule 3: The centripetal effect and the stimulation frequency

The frequency of using language constituents has a direct connection with the frequency of using language constituents (Keller et al., 2001; Mahmoudian, 1982; Matthei & Roeper, 1985; Prat et al., 2007). Also, as Keller et al. (2001) point out, the frequency of occurrence is often viewed as an important factor in speech comprehension and memory experiments.

4.4. Rule 4: The centripetal effect of active versus passive stimulation

As Gile (2009) points out, active stimulation of any language constituent in speaking and writing has a stronger centripetal effect than passive stimulation. The centripetal effect becomes stronger where language constituents are frequently stimulated. That is to say, using language constituents during speaking and writing causes them to move strongly toward the nucleus. That is why language teachers always direct the class towards active use of the language constituents such as rules and lexis. There is no doubt that active stimulation of language constituents has a higher potential for centripetal effect than passive stimulation. That is to say, language constituents that are used in speaking or writing push the language constituents stronger toward the nucleus than being stimulated through reading or writing (Thorndike & Lorge, 1994).

4.5. Rule 5: The interference effect and the escort effect

The centripetal movement of the language constituents causes the centripetal movement of the other language constituents. When a language constituent is more available, the other language constituents that sound or look the same show a tendency to become more available. Costerman (1980) calls this phenomenon as escort effect. Needless to say, the escort effect might cause linguistic interference (Costerman, 1980) as it may cause the interpreter to use a word incorrectly or to distort its sound when speaking or writing. However, the escort effect suggests that stimulation of a word will stop its centrifugal drift and also make it more available while having a similar effect on other words associated with it. However, as it is stated by Gile (1988), the escort effect causes linguistic interference. Linguistic interference causes the interpreter to use the incorrect meaning of a word to distort its sound when speaking or even to use a word from the wrong language when speaking.

Hence, to implement the paradigm of a gravitational model of language availability, the acquisition of a second language means being professional in all four skills of language.

5. Conclusion

As Gile (2009) points out, the Gravitational Model is on this tenet that different words have different levels of availability for interpreters. Word availability is dynamic, increasing with activation and decreasing with deactivation (Eysenck & Keane, 1990; Michael et al., 2001). As stated earlier, active stimulation of lexical terms through speaking and writing is normally more effective than passive stimulation of words through reading and listening. Hence, this review highlights the importance of active stimulation of lexical items prior to conference interpreting. Moreover, the Gravitational Model states that the activation of words depends mostly on the frequency of word use (Feng 2002; Lin, 2004; Zhong, 2007). However, this does not mean that memorization and repetition practices are efficient for enhancing lexical words. In other words, active stimulation of lexical items causes automaticity in accessing lexical items. As Segalowitz (2003) points out, the automaticity of lexical processing fosters language processing in language production. As Newell (1990) states, automatic processing is fast, ballistic (unstoppable), independent of the amount of information processing being processed, and involves no awareness of processing. Many studies (Posner & Snyder, 1975; Segalowitz, 2003; Schneider & Shiffrin, 1977) provide evidence on the fact that automaticity causes fluency and fluency refers to the ability to speak fluently and undoubtedly fluency cannot be reached

without automatic grammatical processing or even automatic word recognition.

Hence, the Gravitational Model of lexical availability offers practical guidelines for interpreters' preparation before the interpreting process. One major implication from this review is that language constituents that are available for production step by step lose their availability until they can no longer be retrieved from long-term memory for production and subsequently they can only be recognized when used by others in speeches. Interpreters' active stimulation is grounded if the interpreters use technical lexical corpora for diverse settings. Practicing ready corpora beforehand enhances interpreting performance as it prevents saturation during the interpreting process (Gile, 2008). Lower availability in speech production leads to more pauses and lags which slows down the interpreting process. This also might lead to a lack of accuracy due to the saturation of the working memory capacity. Whereas the Gravitational Model does not state directly, that deeper semantic processing develops memory (Craik & Lockhart, 1972). To reformulate, shallow semantic processing such as rote repetition and mechanical memorization does not cause active availability of words. Another implication from this study is that interpreter trainees must invest great efforts to promote their skills to the required level, and in particular enhance their vocabulary knowledge concerning their specific domain of interpreting. Furthermore, this is truly essential for them to improve their comprehension availability and also production availability of the language constituents that are related to their work as interpreters. Furthermore, novice interpreters should come to this consensus that high-frequency language constituents signify the large proportion of language constituents in texts or speeches, when one language constituent becomes lower in frequency, its proportion in the text or speech drops sharply. Many studies (Thorndike & Lorge 1944; Meier, 1964) report the relationship between the rank frequency of language constituents and the frequency of occurrence. Hence, the Gravitational Model endeavors to make the interpreters understand the fact that the most frequent language constituents are the most available in the interpreters' mental lexicon because of their frequent use, while less frequent language constituents that are less encountered in daily language tend to be forgotten. Under the tenets of the Gravitational Model, Gile (2009) advises interpreters who are working in a B language to use simple words and construction since B-language constituents are less available than A-language language constituents and it is less likely that they cause mental saturation (Gile, 1999b; Goldman-Eisler, 1958; Keiser, 1978).

In a nutshell, under the tenets of Gile's (2009) gravitational model, the following aspects of language availability of language constructs are important for raising students' awareness.

1. The availability of language units depends extensively on how frequently they are used;
2. The availability of language units varies over time. It increases with repeated use, and declines when unused;
3. Production increases lexical availability compared to using lexical items in comprehension.
4. The availability of each language unit is not necessarily the same for comprehension and production;
5. Lexical availability increases the availability of the language units that are associated with it through context, emotional experience, or shared morphological, phonological, or visual features.
6. Higher language availability is equal to saving attentional resources and time requirements in comprehension or production which subsequently lowers the risk of cognitive saturation.

Gile's (2009) Gravitational Model offers one important message to the interpreter trainees and that is having the knowledge of a language is more than knowing a yes/no state for each individual lexical unit or rule as knowledge of the language constituent including availability or the time and the effort which is required to retrieve the necessary knowledge for comprehension or production of texts.

All in all, Gile's Gravitational Model is on this tenet that high availability is therefore crucial in interpreting. More specifically, interpreters need to have high comprehension availability in their passive languages and high production availability in their active languages. One vital implication of such an availability issue is that interpreters need to work on their languages in order to reach and maintain high availability. Moreover, since the escort effect operates across languages, it facilitates production in the target language. To conclude, having knowledge of a language involves the availability of the lexical units at an appropriate time when it is required to receive the necessary knowledge for comprehension or production of the texts. Moreover, the availability of lexical units is not a static phenomenon (Eysenck & Keane, 1990) but it increases with repeated stimulation and decreases when language constituents are not used so it is truly crucial for interpreters to work on their working languages prior to doing interpreting tasks.

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