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Analysis of Sound Effect Classification in English Comics and their Persian Translations

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Abstract
Comic books have received attention as multimedia texts profiting from words and pictures combined in order to narrate a specific story. As one of the features of comic books, sound effects such as onomatopoeic expressions contribute to the readability of these books. This descriptive study aimed at examining the effectiveness of different proposed classifications in accounting for all the cases of sound effects in English comic books and their Persian translations. In this case study, the focus was on seventeen English comics and their Persian translations. This study classified the cases of sound effects according to three classifications including Attridge's lexical and non-lexical onomatopoeia, Kokko's onomatopoeic and non-onomatopoeic sound effects, and, Hinton, Nichols and Ohala's sound symbolism. According to the results, Attridges' and Kokko's classification categorized all of cases of sound effects in the sample (100 percent); however, the classification by Hinton, Nichola, and Ohala didn't account for all the cases of the sound effects. Moreover, the findings also indicated that the sound effects were not duly reflected in the Persian translation of comic books. The findings of this study can give sufficient insight to comic book writers and translators regarding the most common categories of sound effects.

Keywords: Comic books; Onomatopoeia; Sound effects; Translators; Sound symbolism

INTRODUCTION

The history of comic books goes back to a long time ago and these books are being published in different countries and languages, and address all age groups (Kokko, 2013; Nijskens, 2017). According to Kaindl (2000, p. 2), "Comics are narrative forms in which the story is told in a series of at least two separate pictures. The individual pictures provide contexts for one another." Eisner (1985, p. 10) also, referred to comics as "sequential art". Plus, there is McCloud's (1994, p. 9) definition as, "juxtaposed pictorial and other images in deliberate sequence, [which are] intended to convey information and/or produce an aesthetic response from the viewer". Lastly, Hayman and Pratt's (as cited in Meskin 2007, p. 1) definition of a comic as a "pictorial narrative" improved on other definitions.

Onomatopoeia are one of the salient features of comic. There are several classifications for onomatopes in the literature. Guynes (2014) for instance, divided onomatopoeia in comics into two subcategories: vocalizations and sound effects. Attridge (2004), divided them into the two lexical and non-lexical onomatopes. There is a more famous classification called sound symbolism including subcategories of corporeal,

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imitative, synthetic, and conventional sound symbolisms (Hinton, Nichols & Ohala, 2006). As another classification, sound effects are either onomatopoeic or non-onomatopoeic (Kokko, 2013).

The focus of this study was on sound effects—instead of all onomatopoeia. This work utilized three different classifications to find out which classification is more effective in accounting for all the cases of sound effects in the selected sample of comic books. Furthermore, the study further analyzed the selected effects and their parallel Persian translations to tabulate the frequencies of the cases in subcategories of each classification to find out which is the most frequent subcategory. The first classification is employed to see if a sound effect already exists in the language (lexical onomatopoeia), or if it is made up especially for the intended situation (non-lexical onomatopoeia) (Attridge, 2004). The second classification categorizes sound effects into two groups of onomatopoeic and non-onomatopoeic (Kokko 2013). The third classification is sound symbolism (Hinton et al., 2006). Ultimately, the research questions in this study are as follows:

RQ1. *Which subcategory in each of the selected three classifications is the most frequent when applied to the selected cases of the English and Persian comics*

RQ2. *Which of the classifications is more effective in accounting for the sound effects in the selected cases of comic books?*

REVIEW OF LITERATURE

Onomatopoeia and Sound Effects

An onomatopoeia indicates words that are based on natural sounds found all around us; that is, they are imitative words such as: hiss, buzz, boom, etc. (Macková, 2012). All kinds of texts employ onomatopoeia, but they are applied in comic books much more extensively (Macková, 2012; Kokko, 2013). "Onomatopoeia provides comics with a way of expressing unarticulated sounds of the surrounding world in writing …" (Kokko, 2013, p. 35).

The presence of onomatopoeia in language has sometimes been found troubling; it is said that onomatopoeic words are formed on the basis of phonic similarity, because they are iconic signs referring to objects (Guynes, 2014). Saussure (1966) first believed that all words were arbitrary; therefore, the sheer existence of onomatopoeia challenged his belief. He tried to justify this presence by asserting that onomatopes were not one of the primary parts of any language; he also claimed that after onomatopes join a linguistic system, they obey the same phonetic and morphological rules as the rest of the lexical items. It seems that the patterns observed in sound symbolism, indicate a tendency rather than a truly dependable connection. Different aspects of onomatopoeic relationships like what exists between low-pitch sound and domineering behavior are part of what is called associative meaning, rather than inherent referential meaning Since a lot of words with similar meaning do not follow the pattern, it can be safely concluded that onomatopoeia doesn't violate the arbitrariness of language.

Onomatopoeia has had several ways of classification by different scholars over the years. There is Attridge's (2004) classification which may suggest sound as irrelevant to comic books though; however, it contributes to the task. According to this classification, onomatopoeic expressions are either lexical or non-lexical. He clarified that lexical onomatopes (terms like buzz, crack and thud, the pronunciation of which was a symbol for their referent) were established words in the English language. In other words, they can be found in dictionaries. This category is the same as Levý's (1967, as cited in Hatim & Munday, 2004) functional onomatopoeia.

On the contrary, non-lexical onomatopoeia in this classification was a group of vowels and/or consonants juxtaposed to imitate an environmental sound (such as vroom or brrrrm that is intended to mimic the sound of a car); non-lexical onomatopes are intended for a specific target and conventionally don't exist in the language, which means that they are non-existent in dictionaries. Finally, this second category is corresponding to Levý's (1967, cited in Hatim & Munday, 2004) ad hoc onomatopoeia. Figure 1 depicts the classification proposed by Attridge's (2004).

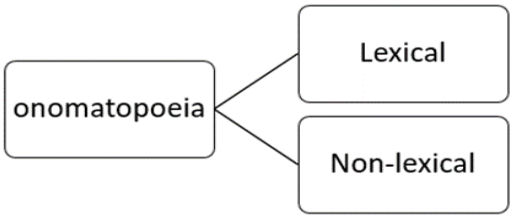


Figure 1
Attridge's classification of onomatopoeia

From another perspective, regarding comic books, there has been a much more influential classification of onomatopoeic expressions (Macková, 2012). This classification as introduced by Guynes (2014) involves two subcategories for onomatopes existing in comics: vocalizations and sound effects. Vocalizations consist only of those onomatopes made by a person's vocal cords like laughs, hisses, and coughs, along with others. They are by design usually located inside speech boxes (although exceptions may be spotted). This is on the account that vocalizations are generated by a human voice; thus, they must be part of people's conversations.

Besides, sound effects are there to improve the readers' experience so that the narrative does not feel muted (Wallner, 2020). They are those sounds not made by human vocal cords—such as the sound of explosions, guns, or combats—so it turns out that they are sounds of things or actions, and on contrary to vocalizations, sound effects are consistently placed inside the pictures, well outside balloons and far from character's conversations (Pratha, Avunjian, & Cohn, 2016). In other words, "Vocalizations are words, but sound effects are word/image combinations" (Guynes, 2014, p. 3) (See Figure 12).

Boer (2017, p.3) used the phrase "textualized sound" interchangeable with sound because they are "linguistic depictions of noises"; while Hague (2014, p.64) described them as "representations of sounds" in the visual domain. Figure 2 represents Guynes's (2014) classification.

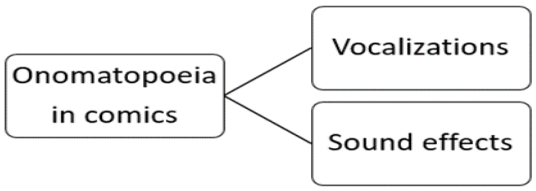


Figure 2
Classification of onomatopoeia in comics

It can be debated that, regardless of the previously suggested definitions of onomatopoeia, sound effects have a classification of their own too. First, there are the normal expected sound effects like BOOM and RING, which visibly have an onomatopoeic, sound-imitative nature (Kokko, 2013). The entry for these effects in a dictionary includes words like 'sound,' or 'noise' or any similar or related word. For instance, the entry for BOOM in the English Oxford dictionary, displays the following definitions: 'A loud, deep, resonant sound'.

Second, Kokko (2013) reported there were words like JUMP, BREAK, or SHAKE. In a neutral situation these words are not considered onomatopoeia; however, in comic books they are used as sound effects. She described the goal of these effects (e.g., JUMP, BREAK, PUNCH) as representing sounds (like the sound of somebody jumping, or the sound of something breaking), whose nature was not considered a sound. Again, the definition of these words will be indicative of sound or noise. The second category is sometimes called unsound effects, which are employed either in a humorous manner or more influentially in fight scenes. ('Unsound effect', 2018). Figure 3 illustrates the classification of sound effect as proposed by Kokko (2013).

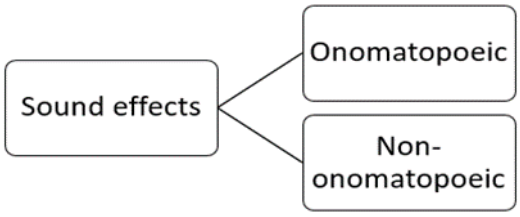


Figure 3
Classification of sound effects

It is worth mentioning that sound effects have a style of their own. Primarily, sound effects are printed in all capital letters (Kokko, 2013). Then, typography indicates that font, and size of lettering can convey meaning (Valero Garcés, 2015). A larger font size could mean a louder sound; thus, typography proves where a sound comes from, how fast it is, in which direction it is going, and what emotion or mood it represents (McCloud, 2006).

Sound Symbolism

Another area in which sounds and some particular features of words are inextricably linked, is sound symbolism (Kokko, 2013). Previously, linguistic theory believed that the relationship between sound and meaning was arbitrary, and if contradicting cases to this rule were detected, they were only considered rare exceptions; however, research about sound symbolism has contributed to further clarification of this relationship (Hinton et al., 2006). As a matter of a fact, "Sound symbolism is the study of the relationship between the sound of an utterance and its meaning" (Hinton et al., 2006: 2).

Sound symbolism makes a link between sound and meaning, but the directness of this link is not the same in all words (Hinton et al., 2006). Therefore, the following typology of sound symbolism was offered:

1. Corporeal sound symbolism happens when a person uses sounds to show his/her emotional or physical state; of which Ha Ha Ha, Ouch, and Augh—that are mainly simple vocalizations— are typical cases; this sound symbolism is used in English comics with an expressive function in order to convey what characters are feeling (Hinton et al., 2006).

2. Imitative sound symbolism represents onomatopoeic expressions utilized to show sounds from the surrounding environment which are not parts of a person's speech (e.g. bang, boom, slam, zap, etc.); typically, linguistic studies have focused more on imitative sound symbolism than the corporeal one (Hinton et al., 2006).

3. Synthetic sound symbolism: "This realm of sound symbolism can be defined as the acoustic symbolization of non-acoustic phenomena" (Hinton et al., 2006, p. 15). To be clearer, concepts like shape and size should normally have nothing to do with sound; however, sometimes certain sounds (vowels or consonants) can indicate the size or shape of objects; consequently, palatal consonants and high vowels represent small objects (Hinton et al, 2006). To give examples of synthetic sound symbolism in English, the words chip, slit, chink and dint, all sound smaller than the words chop, slot, chunk and dent, which implies that the vowel i is used in words with a small size (Nordquist, 2018). Such a relationship can be observed in different languages. Scottish English speakers, for example, have wee and many English dialects have a pronunciation like “leetle” for little. Both Portuguese (with -inho, as in copinho “small glass”) and Spanish (with -ito, as in perrito “small dog”) use the /i/ sound in endings that indicate a small version of something (from copo “glass” and perro “dog). The link between sound and the meaning of a word in synthetic symbolism is less direct than the previous two, so exceptions to this area are relatively more common (Hinton et al., 2006).

4. Conventional sound symbolism: "This is the analogical association of certain phonemes and clusters with certain meanings" (Hinton et al., 2006, p. 16), and it is based on the way certain sounds and meanings are frequently grouped together (Hinton et al., 2006). For instance, *gl* in the words glow, gleam, glimmer, glisten, and glitter indicate brightness and smoothness, the cluster *ump* in the words hump, lump, bump, rump implies the concept of rounded, or words beginning with fl- are associated with being quick and/or light (flee, flit, fly) (Nordquist, 2018). This category is the closest to arbitrariness (regarding the relationship between sound and meaning) among the four categories of sound symbolism (Hinton et al., 2006).

PREVIOUS SIMILAR RESEARCH

There are no shortage of discourse considering onomatopoeia, but they are out of the scope of this article because comics are a key issue here. There are tens of studies focusing on onomatopoeia in comics, some of which are simply analyses of onomatopoeic terms (Aulia & Saifudin, 2022; Covey, 2006; Dey & Bokil, 2017; Pratha et al., 2016); whereas, some have explored different types of onomatopoeia.

A number of pieces of research (Muin, Rauf, & Hidayat, 2016; Sari, 2012; Wijaya, Candra, & Juniartha, 2022) sought to classify the onomatopoeia they found in their respective case studies according to categories introduced by Bredin (1996): direct, associative, and exemplary; ultimately, each work determined which category covered the majority of their data. Moreover, this goal (i.e., classifying sounds

found in comics according to a certain theory and finding the most common classification) was shared by other articles too. Firdaus, Hardiah, and Damayanti (2021) took advantage of Ullman's (1962, as cited in Firdaus et al., 2021) primary and secondary onomatopes. As other instances, both Maheni, Candra, and Juniartha (2021) and Puspayoga and Suastini (2023) adhered to the typology put forth by Elizabeth (2013)—mechanical, fast motion, animal, and fighting sounds.

Although there is a great body of literature addressing sounds in comics in general, explorations of translated onomatopoeia are rather rare. Some writings have examined how the translators have gone about translating onomatopoeia in comics or Mangas (Japanese comic books), the challenges posed by this type of words, and if contextual meaning was changed in translation (Elveljung, 2020; Holt & Curtin, 2022; Igareda, 2017).

A few studies decided to approach sound symbolism. Pischedda (2020) tried to learn about ideophones' translation strategies. Two more papers adopted Hinton et al. (2006) model of sound symbolism: Zolfagharian and Ameri (2015) chose TinTin band dessinées (French comic books) plus two separate Persian translation for each comic only to find that translations of the onomatopoeic words were adapted to the original texts; while Abdurrosyid and Santika (2017) studied the translation of sound symbolic works in Manhwas (Korean comic books).

The other works had two main goals in mind: primarily, to see what strategies (e.g., borrowing, deletion, adaptation) were employed to translate onomatopes and which strategy was the most common; then, to categorize onomatopoeic expression. Haninisa, Purwaningsih, and Handoyo (2020), Mansur and Erlin (2018), and then later on Mansur, Hadiyani, and Purnamasari (2020) sorted onomatopes into nature, animal, human, and miscellaneous sounds; while Widiyantari and MW (2018) did so with lexical versus non-lexical terms.

METHODOLOGY

Research Design

This study was a descriptive study. Descriptive design is a primary research type which seeks to objectively describe a phenomenon without exploring its causes or functions; this form of research essentially provides basic information that will benefit certain groups of people (Lunenburg & Irby, 2008).

Case studies

This study was delimited to a corpus of 17 comic books and one Persian translation for each of them. Comic books with published Persian translations were delimited to only Sponge Bob and Tintin comics, because other comics whose Persian versions properly included sound effects were not available to the researchers. These cases included ‘Seven Sponge Bob’ and three ‘Tintin’ comics. Three ‘DC superhero comics’ and four ‘Marvel superhero’ comics were also utilized as unofficial internet translations (aka scanlations)

The comic books were in different languages. ‘Sponge Bob,’ ‘DC,’ and ‘Marvel comics’ are obviously all originally English. However, in those cases, like ‘Tintin’ comics which was originally in French, the researchers focused on the Persian translation of the English versions of these books.

Additionally, the onomatopes in this work were delimited to only the sounds of actions (i.e., sound effects). One of the main characteristics of sound effects is always appearing inside the pictures, while vocalizations are known to appear normally inside dialogue boxes; however, vocalizations (sounds made by human vocal cords) are sometimes found inside pictures as well. Both kinds of vocalizations (whether they have appeared inside dialogue boxes or inside pictures) are eliminated from this analysis. In the end, 150 sound effects were found in the above-mentioned comic books.

Dictionaries

The researchers of the study consulted three dictionaries of, Oxford, Webster and Urban online dictionaries to access English onomatopoeic expressions. In addition, there was a reference to the dictionary of Persian onomatopoeia to search for popular Persian onomatopes. The researchers used the Dehkhoda Persian dictionary to access the meanings of Persian words.

Data Collection and Analysis Procedures

In the beginning, all the sounds of action (i.e., sound effects that were deeply embedded in the pictures) were collected from the selected sample. After that, the equivalent sound effects were also recognized in Persian translations.

In order to analyze the data, the researchers applied Thematic analysis which looks for recurrent patterns or themes, describes the data, and explores the data for meaning (Braun & Clarke, 2006). Thematic analysis is "a process of segmentation, categorization and relinking of aspects of the data prior to final interpretation" (Gribch, 2007, as cited in Matthews & Ross, 2010, p.273).

The researchers also consulted the selected dictionaries so as to see if a sound effect already existed in the language, or it was non-lexical. Following that, dictionaries were used again to learn if sound effects were onomatopoeic, or non-onomatopoeic. In the end, sound effects were examined so that it could be uncovered to which category of sound symbolism they belonged (Hinton et al., 2006).

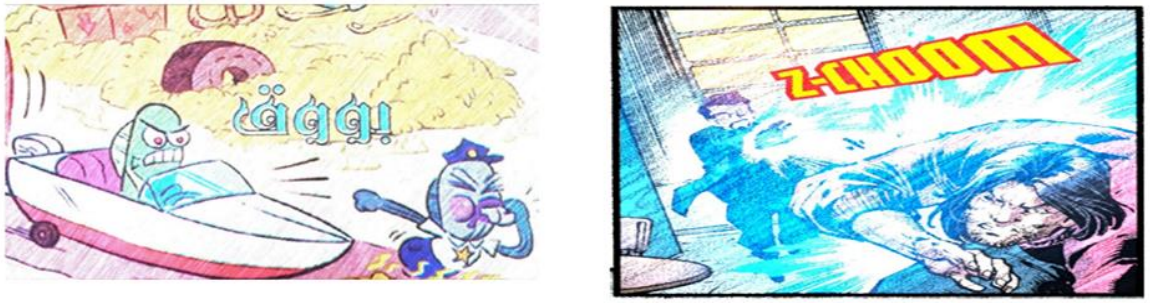
Data Analysis

The researchers extracted the cases of the sound effects from the pictures and then utilized different classifications to categorize them. Some examples of these sound effects and the process of their analysis and their categorization according to Attridge (2004) are presented in Table 1.

Table 1

Examples according to Attridge's (2004) model

Sound effects	Analysis	Classification
BEEP (Sponge Bob 2, p. 33)	According to the Oxford dictionary, if a car horn beeps, it makes a loud noise. So, this effect has an entry in dictionaries.	Lexical
CRASH (Spider-man: Homecoming prelude 1, p. 4)	The Oxford dictionary introduced CRASH as a sudden loud noise of something breaking or hitting another object.	Lexical
بووق /βυ:κ/ (Sponge Bob 2, p. 34)	Dictionary of Persian onomatopoeia, define بوق as the sound of a car horn**.** This is a legitimate Persian word.	Lexical
شیپور /Σεφπυ:ρ/ (Sponge Bob 5, p. 12)	According to Dehkhoda dictionary, شیپور is a trumpet, so it is a word found in the Persian language.	Lexical
Z-CHOOM (Spider-man homecoming prelude 1, p.13) (See Figure 5)	This effect could not be found in any dictionaries,	Non-lexical
CRAKOOM (New avengers 2, p.9)	This is not a word that English speakers would use in any case on a daily basis.	Non-lexical
دروم /δρυ:μπ/ (Sponge Bob 10, p.29)	دروم is a word of the translator's creation, it doesn't exist in Persian.	Non-lexical



Lexical: بووق (۲ باب اسفنجی [Sponge Bob 2], 2014, p. 34)

Non-lexical: Z-CHOOM (Spider-man homecoming prelude 1, 2016, p.13)

Figure 4

An example of sound effects according to Attridge's classification

Table 2
Examples according to Kokko's (2013) model

Sound effect	Analysis	Classification
TOOT (Red Rackham's treasure, p.15**)**	Based on the Oxford dictionary, TOOT means a short, sharp sound made by a horn, trumpet, or similar instrument. It indicates a sound.	Onomatopoeic.
RING (Sponge Bob 10, p.6)	In conformity with the Oxford dictionary, A RING is an act of ringing a bell, or the resonant sound caused by this. It can be seen that RING imitates a natural sound.	Onomatopoeic.
قرچ /κερετΣ/ (Sponge Bob 15, p.28)	قرچ is the sound of something being ripped, which is according to the dictionary of Persian Onomatopoeia.	Onomatopoeic.
دررینگ /dρIN dρIN/ (Sponge Bob 3, p.10)	As maintained by the dictionary of Persian onomatopoeia, دررینگ is a ringing sound, which makes it onomatopoeic.	Onomatopoeic.
SHAKE (Sponge Bob 8, p.21)	According to the Oxford dictionary, to shake means to tremble or to vibrate. By this logic, it has nothing to do with sounds.	Non-onomatopoeic.
PULL (Sponge Bob 5, p.12	The way the Oxford dictionary put it, to pull means to exert force on (someone or something) so as to cause movement towards oneself.	Non-onomatopoeic.
ماچ /μA:τΣ/ (In the land of the picaros, p.48) (See Figure 7)	According to Dehkhoda dictionary, ماچ is the act of kissing, which doesn't imitate any sound.	Non-onomatopoeic.

Onomatopoeic: RING (Sponge Bob 10, 2012, p.6) Non- onomatopoeic: ماچ در سرزمین پیکارگران [In the land of the picaros], 2005, p.48)

Figure 5
An example of sound effects according to Kokko's (2013) classification

In the third phase of the data analysis, the researchers applied the third classification (Hinton, et al., 2006). Table 3 represents some examples of these sound effects and the process of their analysis and their categorization. Since imitative words are the same as onomatopoeic sound effects, no new examples will be given, but here are examples of conventional words:

Table 3
Examples of conventional sound effects (Hinton et al., 2006)

Sound effect	Analysis	Classification
ZING, TING, KTING, DRING, BDING, KLING (Whatever happened to the man of tomorrow? p.13	Some similar-sounding onomatopes were grouped together or repeated in comic books.	It is conventional
TAK, TOK (Batman Hush 2, p.6)	Some similar-sounding onomatopes were grouped together or repeated in comic books	It is conventional
CREAK, CRACK (Spider-man: Home-coming prelude 1, p.15) (See Figure 8)	Some similar-sounding onomatopes were grouped together or repeated in comic books	It is conventional
THOOM, CRAKOOM (New avengers 2, p. 9) POOM, FOOM (New avengers 3, p.16)	Some similar-sounding onomatopes were grouped together or repeated in comic books	It is conventional

RESULTS AND DISCUSSION

After classifying the set of data into different categories according to the mentioned classifications, the researchers used descriptive statistics to quantify the number of cases in each category in different classifications. Table 4 represents the descriptive statistics for three classifications:

Table 4
Categorization of data according to the three classifications reported in frequencies and relative frequencies

Comic books	Attridge (2004)		Kokko, (2013)		Hinton, Nichols & Ohala, (2006)			
	Lexical	Non-Lexical	Onomatopoeic	Non-Onomatopoeic	Corporeal	Imitative	Synthetic	Conventional
English	86 (57%)	64 (43%)	116 (77%)	34 (23%)	0	116 (77%)	0	14 (9%)
Persian	54 (36%)	28 (19%)	68 (45%)	14 (9%)	0	68 (45%)	0	14 (9%)
Total								

Starting with Attridge's model, in conformity with Table 4, there were more lexical sound effects than not in either language, which would mean that both comic book writers (along with designers) and translators preferred to use words that already existed in the language instead of making them up. Among all sound effects, the majority from the comics translations (superhero comic books) were non-lexical. The cause of this could be the fact that superhero comics were mostly concerned with the action, and they printed sound effects to represent the noises caused through action sequences. Thus, the sound of an onomatopoeia was more important than its meaning. Furthermore, it seems that most sound effects in Sponge Bob and Tintin comics were lexical. This was on the grounds that these comics were funny comic books, not action ones. Besides, they were printed for children; hence, the meaning of an onomatopoeia tended to be quite as serious as its sound.

Also, as per Table 4, the number of sound effects in Persian was considerably fewer, the logic behind it is that all English sound effects in superhero comics were left untranslated; translators did not treat sound effects at all, and left them alone. Also, many effects were deleted in published translations, as if they never existed in the first place. Moreover, the translators have tended to apply some Persian onomatopes more than once. On a different note, most non-lexical sound effects in Persian were a result of transliterations; translators have made up the rest. This was on the account that Persian does not benefit from having as many sound effects as English does. Comic book industry has been thriving in English speaking

countries, plus sound effects have been a part of comic books from very early on; therefore, English has not had a dire shortage of sound effects (Nemati, 2013). On the other hand, comics industry has not been prospering in Iran, since there have not been many original comics, and comic book translation has not been an old trend (Davoodi Panah, 2014). Accordingly, Persian has not had the advantage of a rich sound effect culture.

Moving on to Kokko's model, in order to explain Table 4, onomatopoeic sound effects were more frequent than non-onomatopoeic ones (aka unsound effects) in both English and Persian. In trying to explain this phenomenon, the mere definition of sound effects can lead people to believe that they should always be onomatopoeic; even Guynes (2014) placed sound effects in a subcategory of onomatopoeia. Although it is true that non-onomatopoeic sound effects exist, sound effects are sounds after all, so it makes sense that they should be onomatopoeic in nature. This is why most sound effects are onomatopoeic, and unsound effects are just anomalies that have found their way into comics.

Finally, having arrived at categories of sound symbolism, First, since only sound effects were selected, and vocalizations were excluded, there existed no corporeal sound symbolism in this data. Second, as for imitative sound symbolism, there existed a high frequency of them, and if some attention is paid to Table 4, it can be seen that the frequency of imitative sound symbolism is the same as onomatopoeic sound effects; this is because all onomatopoeic sound effects are by definition imitative of a sound. Third, no sound effects belonging to synthetic sound symbolism were detected. Fourth, 14 conventional sounds were found in English and none in Persian.

CONCLUSION

This study aimed at tabulating sound effects in certain cases of comic books according to three selected classifications. There was also an attempt to evaluate different classifications and select the one that successfully labels most of the sound effects.

Some problems during the course of the research were encountered causing limitations. Initially, comic book translation is a young trend in Iran; only a modest number of comics have been translated by professional translators. Although translations are not scarce, they have not treated sound effects with (the much needed) care. Moreover, some sound effects, either English or Persian, are made up only for that occasion, and do not already exist in the languages. This means that they cannot be found in dictionaries, so it may be difficult to know their meaning.

It should be noted how this research can be significant. First, it can be useful to those who want to explore the nature of sound effects in both English and Persian comic books. Second, it will help comic book writers and translators because it will show them what sorts and categories of sound effects are more common so that they can create comic books filled with proper sound effects**.**

At long last, the findings of this work answered the research questions. For the primary question and the more frequent categories in each model**:** In Attridge's model, lexical sound effects were more recurrent in both source and target languages, which is logical since it is easier to use already existing words than to make new ones up. To add into the bargain, it seems that superhero comic producers were quicker to make up sound effects as the majority of non-lexical effects were found in superhero comics. On the other hand, most non-lexical sound effects in Persian were a result of transliterations; the rest have been made up by the translators.

Additionally, through Kokko's approach, Both English and Persian exhibited wider range of onomatopoeic effects in comparison to non-onomatopoeic ones, which again does sound logical since sound effects were first recognized as a subcategory of onomatopoeia, so they have to have a sound; unsound effects (aka non-onomatopoeic sound effects) are the abnormal (and still less likely) occurrences that were later devised. Last but not least, among the four subcategories of sound symbolism, only two (imitative and conventional) were spotted in the cases with imitative symbolism having the highest frequency.

In general, reviewing the categories, it seems that the onomatopoeic category is one of the most frequently assigned categories. This also holds true for the Persian translations due

to the fact that the translated versions mostly did not change the onomatopoeic or non-onomatopoeic nature of their original English effects. It is mention-worthy as well that the number of sound effects in Persian was considerably fewer than English, because many English originals were left untranslated or deleted. Besides, the translators have tended to use some Persian onomatopes considerably more than once.

Now for the secondary question, Attridge's and Kokko's approaches covered without fail all the sound effects found in the case studies in both source and target languages, leading the researchers to believe that these two are suitable successful models for categorizing sound effects. However, there were certain sound effects that didn't fit in any sound symbolisms, which will lead to the conclusion that it is not the best model for studying sound effects.

Similar to the present study all the above-reviewed ones resorted to qualitative research methods for examining onomatopoeia. Although many research items divided sounds into categories, since their chosen groupings were different from the ones adopted for this study, or they used the same theories in a different way, the results cannot be directly compared. Nonetheless, there are two articles whose results can be compared to this one. Siddiq (2019) investigated onomatopes in Hulk (Marvel comics) according to Hinto et al. (2006) and found that imitative sound symbolism covered most of the data. Furthermore, the majority of found cases in a Minion comic by Widiyantari and MW (2018) were lexical words.

Therefore, the results of this article have found resemblances in previous literature. In spite of that, the present work is unique of its own accord because it is the only feature that has classified onomatopoeia both in the original comics and their translations. The other works either were not about translation at all, or they categorized only the onomatopoeia they found in the original language and not the ones in the translated versions.

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