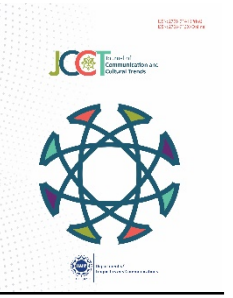
Journal of Communication and Cultural Trends (JCCT)
Volume 5 Issue 1, Spring 2023
ISSN$_{(P)}$: 2706-9141 ISSN$_{(E)}$: 2706-915X
Homepage: https://journals.umt.edu.pk/index.php/jcct

Article QR



Title:	**Words in Mental Lexicon: A Comparative Analysis of Word Association (WA) Responses of Pakistani L1 and Afghan L2 Speakers of Urdu**
Author (s):	Sara Khan, Muhammad Asif Ikram Anjum
Affiliation (s):	COMSATS University Islamabad, Lahore Campus, Pakistan
DOI:	https://doi.org/10.32350/jcct.51.05
History:	Received: June 1, 2022, Revised: December 21, 2022, Accepted: December 22, 2022
Citation:	Khan, S., & Anjum, M. A. I. (2023). Words in mental lexicon: A comparative analysis of Word Association (WA) responses of Pakistani L1 and Afghan L2 speakers of Urdu. *Journal of Communication and Cultural Trends*, *5*(1), 86–105. https://doi.org/10.32350/jcct.51.05
Copyright:	© The Authors
Licensing:	This article is open access and is distributed under the terms of Creative Commons Attribution 4.0 International License
Conflict of Interest:	Author(s) declared no conflict of interest

A publication of
Institute of Liberal Arts
University of Management and Technology, Lahore, Pakistan

Words in Mental Lexicon: A Comparative Analysis of Word Association (WA) Responses of Pakistani L1 and Afghan L2 Speakers of Urdu

Sara Khan and Muhammad Asif Ikram Anjum*

Department of Humanities, COMSATS University Islamabad, Lahore Campus, Pakistan

Abstract

Vocabulary acquisition in both L1 and L2 has depended on the opinion of associative language learning to help recognize and elucidate the procedures of lexical acquisition and development in the mind of language learners. To date, L2 studies in this area have delivered relatively controversial findings. The current study revisited certain corresponding issues in order to gain insight into the restoration of words in the mental lexicon. Moreover, it also strived to understand the relationship between lexical development and the process of word association (WA). To better understand the relationship between lexical meaning and mental lexicon, this study explored and compared the word associations of a group of Afghan Urdu speakers and a group of Urdu native speakers. It aimed to understand how mental links are developed between lexical items in the mental lexicon, a process commonly believed to partially support vocabulary acquisition. The findings revealed that paradigmatic relations created by L2 learners are dominant in their data sets, while syntagmatic relations are leading in L1 data sets. The findings support general trends in this area of research, that is, learning of Urdu language in Pakistan by foreigners. Moreover, the findings further highlight the importance of lexical associative processes employed in second language acquisition. To conclude, the study contributes to WA research, the description of mental lexicon, and L2 language learning and teaching.

***Keywords*:** clang, encyclopedic, mental lexicon, paradigmatic, syntagmatic, word association (WA) test

Introduction

It is evident that vocabulary acquisition is the inevitable part of language learning process. Wilkins (1972) pointed out that vocabulary is the main

* Corresponding Author: asifikram@cuilahore.edu.pk

essence of language understanding and communication. Language researchers probe to gain insight into the foreign language, vocabulary, and learning process, that is, how lexical items are "learned", "organized", "stored", and "retrieved" by the language learners (Passand, 2015, p. 95). The linguists discovered the device committed to the process; referred it as *'Mental Lexicon'* and defined it as a storage of lexical items in terms of their associative and denotative meaning (khazaeenezhad & Alibabaee, 2013). Even though, linguists (Zhang & Koda, 2017; Pranoto & Afrilita, 2019) explored the mental lexicon, it is an area, which is less subjected to research and scrutiny, specifically when it comes to second language learning. Feasibly, it is due to the lack of considerable research in the aspects of L2 learning. Jiang (2000) puts forward that any theory on second language acquisition must specify interrelation of "representation", "acquisition", and "processing" of vocabulary items (p. 95). Therefore, the study on second language acquisition is inadequate if the representation of lexical items and their retrieval processes are not viewed independently (Çetikaya et al., 2020; Prihatini, 2020). Moreover, it is significant to study L2 development of mental lexicon, as most of the previous studies focused on L1 mental lexicon. In case of the current study, comparison has been developed between Afghan Students and Pakistani Students. Conducting Word Association Tests (WAT) amongst Afghan L2 and Pakistani L1 learners of Urdu Language enabled to configure possible mental links between learned and acquired words.

Keeping in view the perspective of mental lexicon, Aitchison (khazaeenezhad & Alibabaee, 2013) classified four methods to explore mental lexicon of a learner. The elaborated methods "were tip of the tongue/slip of the tongue, corpus of linguistic items, speech disorders, and psycholinguistic observations" (Passand, 2015, p. 95). In the field of psycholinguistics, WAT is used as an experimental basis to test the mental lexicon of both, first and second language learners. Moreover, the tests are also used to investigate and analyze the lexical links of the learners. Aitchison (Passand, 2015) elaborated the process of word retention in the form of word associations and bunches rather than independent storage. WAT is well-known because of their simplicity of application. The word relations are obtained through "stimulus-response" method and the researcher is usually the one that provides the set of impetus words (p. 95). The tests are usually formulated in various manifestations, such as oral prompting of words, oral stimulus words-written response words, and both

written-written methods. The number of response words asked from the learner depends on the nature of the research conducted.

Considering the importance of lexical acquaintance, the current study aimed to investigate the lexical associations maintained and developed by the L1 and L2 leaners of Urdu Language. The current study adapted these tests to the concerned language, that is, Urdu. It is significant for Afghan students to learn Urdu language while living and studying in Pakistan. Urdu language being a lingua franca in the domains of Pakistani society inclines Afghan students to learn in order to communicate effectively on and off campus.

The study administers the following research question:

1. How do Afghan and Pakistani learners of Urdu language constitute stimulus-response associations, such as syntagmatic, paradigmatic, clang, and encyclopedic associations?

The objective of the current study was to compare the semantic structure of the L1 and L2 mental lexicon of Afghan students in terms of Persian (Diri), their mother tongue and Urdu as L2 through WAT according to the Conventional Classification Model. It aimed to explain that how words are systematized in the mind. The results of which may be directly made pragmatic in the etymological teaching, especially in the L2 lexical learning and how to improve the competence to study foreign languages. Finally, the study also aimed to compare the results of Afghan students with that of the native speakers of Urdu language.

Literature Review

It has been observed and studied that the researchers have conventionally grouped word association (WA) responses into three categories, that is, "syntagmatic, paradigmatic, and clang associations" (Harrison, 2015, p.10). The responses associated with paradigmatic and syntagmatic relations are frequently more meaning based as compared to those associated with clang ones, depicting form-based relations (Harrison, 2015). The researchers working on WATs presume that the responses retrieved by the learner during a test reveal the mental nodes of semantic/phonological ties within the mental lexicon of the learner. Thus, it provides insight to the storage of lexical items in the mind.

Fitzpatrick (2007) pointed out that previous researches on WATs exhibited heterogeneity in the interpretation of association configurations. In his research, it was pointed out that L1 learners learn in a considerably predicative way. While, L2 learners show logical difference in responses as compared to L1 learners (Seguin, 2017). Meara (2009) pointed out that it is almost difficult to differentiate L2 responses from L1 due to lack of ample theoretical perspective. His framework though, was also based on the conventional classification, that is, responses were sorted in terms of syntagmatic, paradigmatic, and clang associations (Seguin, 2017).

Despite the somewhat ambiguity in distinguishing word responses of L1 and L2, WATs most recent studies still emphasize the significance of these tests to determine and invest mental lexicon. Wharton (2010) used WATs to retrieve responses against thirty word stimuli. The tests were taken from Japanese students over a three-month period of time. The results proved that vocabulary acquisition is a gradual process. Asgari et al. (2013) investigated the lexical sense relations using WATs with 3000 words and the responses were collected from 300 students. The study concluded with a notion that "lexical storage is inevitably supported by the sense relations", though these relations tend to change with the growing conceptual knowledge of the learner (p. 383). Another prominent study, on the investigation of semantic relation and mental lexicon using WATs was conducted by Roux (2013). In his study, a group of Japanese L2 learners and a group of native speakers were used as participants to collect responses. The results of the responses were also compared revealing general trend of differentiation. A study conducted by khazaeenezhad & Alibabaee (2013) aimed to explore the L2 proficiency level of low level and high-level Iranian EFL learners. The results revealed that students with high level proficiency provided responses in terms of paradigmatic relations and beginners' responses were more related to syntagmatic association, specifically collocations.

Zhang and Liu (2014) deviating from conventional classification model, used spreading activation model. With the methodological tool of WAT, the research aimed to explore the semantic organization in the mental lexicon. The results on comparison revealed that semantic relations in responses by L2 learners were less than L1 learners, that is, paradigmatic structures were dominant in the L2 responses and lastly, clang responses or null responses were more prevalent in L2 responses than L1 responses. Likewise, a study conducted by Ly & Jung (2013) compared L2 and L1 responses to explore

lexico-semantic relations. By employing WAT's high proficiency, L2 learners produce syntagmatic responses. While, in comparison with the native speakers, both low and high proficiency Korean EFL learners exhibited greater syntagmatic responses.

Apart from using the Conventional Classification Model, Passand and Ghaemi (2015) employed Fitzpatrick's Framework to compare the results of WATs of Iranian intermediate and upper-intermediate learners. The results indicated the responses in both syntagmatic and paradigmatic relations. Another study by Seguin (2017), Fitzpatrick, and Thwaites (2020) compared the results of WATs of American L1 and Croatian L2 speakers. The results showed that the experience tends to influence the responses in both sets, creating implication for teachers to connect vocabulary acquisition with real life examples. Lastly, Harrison (2015) explored the mental lexicon of 51 Korean EFL learners through using WAT. The study aimed to investigate the connections that learners create between English words. Additionally, this gender difference was also taken into account. The findings revealed that Korean students tend to store vocabulary in syntagmatic threads rather than 'hyponymical' (hierarchical) classification.

The studies discussed above represent that WATs are employed to investigate the mental lexicon of English language learners and there is hardly any that caters development or organization of semantic/phonological relation of any other language. The learning and acquisition of other languages gauge equal weightage in the language learning process. The current study aimed to go beyond the past studies and inclined to explore the mental lexicon of L2 Urdu language learners. Furthermore, it compared the results with that of native speakers. The study on acquisition of Urdu as a second language is rare and requires eminent research in the area. The current study contributed to the promotion of Urdu language and adding up a somewhat different facet to the study of WATs. Moreover, it aimed to compare the results of Afghan L2 Urdu learners with that of Pakistani L1 Urdu learners.

Methodology

The current section provides insight into the methodological framework employed in this study. It provides details of the participants involved, list of words used for the test, and theoretical framework used for the study.

Lastly, the section also gives detailed account of the analysis of the WA responses.

Participants

The participants of the study comprised 20 Afghan and Pakistani students, each belonging to the program of Bachelors in Business Administration (BBA). The Afghan students were incorporated into the university on the basis of scholarships granted by Higher Education Commission (HEC), Pakistan. The Afghan students were already provided initial teaching of Urdu and English language. Despite the fact that English is the medium of instruction and learning at university, these students require Urdu language learning to harmonize peer communication along with carrying out off campus social activities.

Theoretical Underpinning

The current study used the conventional classification of WA responses to further classify and represent the lexical responses of both Afghan and Pakistani learners more evidently. Conventionally, (Passand, 2015) categorized the word related retorts into classes, such as syntagmatic, paradigmatic, rhyming or clang words, and encyclopedic associations. These word categories were further divided into sub types, that is, syntagmatic relations, which highlight word combinations, such as 'collocations' and 'compound words'. On the other hand, paradigmatic relations highlight word classes, such as "hyponymy" and "hypernym" (p. 96). Wharton (2010) further described syntagmatic relations to be words that are identified as the ones providing sequential connection with the impetus lexical item, which is, presenting grammatical relations with one another and belonging to dissimilar word classes. On the contrary, paradigmatic relations are represented in such a way where the impetus word and the response word are a part of the same grammatical category. A third class of words is dedicated to clang Words. They are categorized as the responses against the stimulus that do not express significant connection, however, provide phonological or orthographical congruence. Finally, it prompts to the stimulus words in relation to the knowledge of world and are classified as "encyclopedic" ones (Ly & Jung, 2013, p. 9; Xiang & Nam, 2022) (see Figure 1). The details of these classifications and sub-categories is provided below.

Syntagmatic Responses: Multi-word and collocations

Syntagmatic relations refer to the sequential occurring of words. In this perspective; multiword, collocations, multi-word units, and metonymy are used to define syntagmatic associations. Collocations are concerned with the frequency of words occurring together (Ly &Jung; 2013). These refer to the notion that lexical collocations define the frequency of lexical items to co-occur.

Multi-word units as defined by Moon (1997) as words that combine to create a single meaningful unit (Ly & Jung, 2013; Xiang & Nam, 2022). Idiomatic phrases and phrasal verbs come under the category of multi-word units.

Finally, metonymy refers to defining semantic relation through conceptual knowledge. It requires linking of two distinctive lexical units, belonging to different word classes, through common implicit conceptual meaning.

Paradigmatic Responses: Synonyms, Antonyms, Hyponyms, and Meronyms

As stated above, paradigmatic associations refer to the words that have semantic associations with each other. In this perspective, synonymy, antonymy, hyponymy, and meronymy constitute the paradigmatic relations in the mental lexicon of a language learner. Synonymy, corresponds to the "sameness" of semantic relation between the stimulus and the responded word (Ly & Jung, 2013, p. 9). However, association of words in terms of meaning sometimes appear to be contextual rather than just relational; thus coined by Fitzpatrick (2007) as "specific synonyms"(p. 9).

Antonymy on the other hand, overtly provides opposite meanings between the stimulus word and the response word. Ly and Jung (2013) pointed out four types of antonyms, such as "complementarity" (representing where presence of one lexical unit discounts the other), "gradable" (express differing of meaning through the use of comparative adverbs), "converseness" (provides logical switch), and "compatibility" (expresses relational oppositeness that cannot co-exist) (Ly & Jung, 2013, p. 9; Xiang & Nam, 2022).

Hyponymy as a paradigmatic association provides the categorized semantic relation between the words, that is, the meaning of a general lexical item is inclusive to the meaning of the specific.

Clang Responses

Words that are connected based on phonological links in the mental lexicon are called as clang words (Ly & Jung, 2013; Xiang & Nam, 2022). Thus, sound pattern or general shape of the word is significant for storage and retrieval of words in the mind.

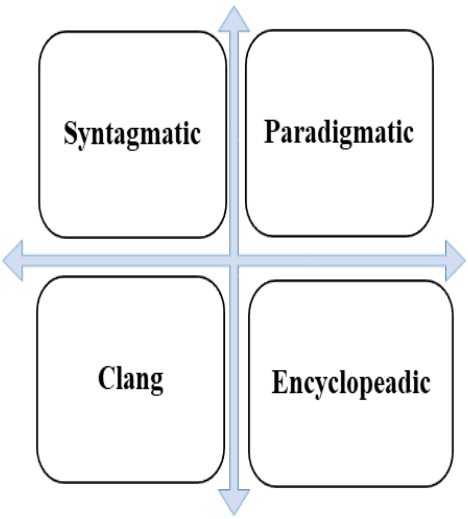
Encyclopedic Responses

Learner's knowledge about the world is significant to create connections and conceptual understanding of the words in the mental lexicon. McCarthy (1990) stated such responses as encyclopedic ones due to the fact these responses reflect the contextual historical events of the learner.

The current study inducing the classification model of W A responses of Urdu L1 and L2 learners significantly administers WATs to the investigation of mental lexicon of languages other than just English (Keeping in view the amount of literature presented on the investigation of mental lexicon of L2 learners of English Language).

Figure 1

Conventional Classification of Word Association Responses



Instrument

The main instrument used in the current study to collect responses based on the list of stimulus words presented as WAT. Since, choosing the words as stimulus and impetus is a significant task, therefore through proper scrutiny certain words were picked that are also a part of Persian (Diri) language, so that the Afghan students may have an initial understanding of the vocabulary. For this purpose, a pilot study was conducted in which Afghan participants were asked to pen down 15 Urdu words each. Through scrutiny of the lists provided by them, the words for WAT were selected. The test conducted consisted of 8 frequently occurring and emotionally neutral Urdu words. The word list, classification of words, and motivation for the choice of words is described in the table below:

Table 1

Word list, Classification, and Rationale for the Selection of Words

Stimulus Word	Word class	Rationale
سبز	Adjective/noun/verb	A polysemy that is part of both cultures
کتاب	Noun	A word in everyday use of the participants
کھانا	Noun/verb	A functionally common word used in both cultures
موبایل	Noun	Though a borrowed word; yet used frequently by the Participants
تیز	Adjective/Verb	A common polysemy used by both set of students.
د رخت	Noun	Common word
آزادی	Verb/ Noun	Perhaps a less frequently used word, slightly more difficult to conceptualize, yet a part of both cultures
پڑھنا	Verb	A function word occurring frequently for a variety of uses

Research Design

Depending on the nature of the study, a sequential exploratory design of mixed method approach was chosen, that is, qualitative collection tools were employed to attain the associative responses. The data was further quantified and qualitatively interpreted keeping in view the Classification theory of Word Associations. However, the quantitative analysis is entrenched in the qualitative design. In other words, collection and analysis of the data qualitatively supported to interpret and illustrate the data quantitative results in the form of graphs.

Data Coding

The WAT conducted in the year 2017, generated 120 responses each from both sets of participants. The data was coded keeping in view the tenets of classification of W A responses, that is, syntagmatic, paradigmatic, clang, and encyclopedic responses. These classifications were further sub-categorized into multiword, collocation, and metonymy for syntagmatic relations and synonyms, antonyms, hyponyms along with meronyms for paradigmatic relations. The responses were thematically sorted, analyzed, and quantitatively represented in the form of graphs.

Analysis of WA Responses

The current section provides the quantitative data analysis of the results of various responses presented by both L1 and L2 Urdu language learners. The analysis as mentioned in the methodology is thematically classified into four conventional the classification of Word Association Tests (WAT). Moreover, this section provides the comparison of the responses provided by the native and Afghan learners of Urdu language.

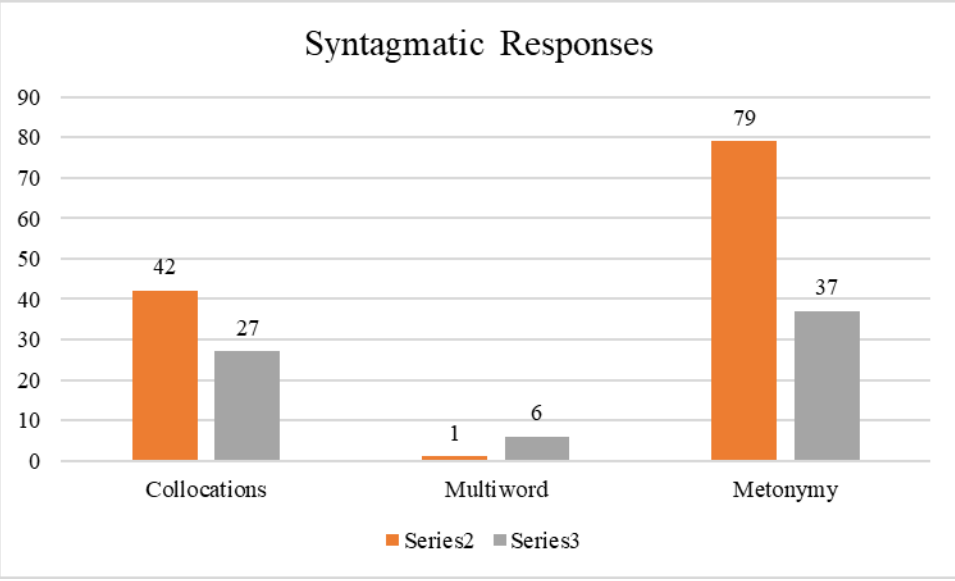
Syntagmatic Responses

This subsection provides with the discussion of how various syntagmatic relations are presented in the form of responses by the two set of learners. Moreover, the graphic representation of the data sets provides insight into the statistical account of the most and least responded syntagmatic relations by the two set of learners.

It is evident from the graphic representation of the syntagmatic responses that both the set of learners employed features, such as collocations, multiword, and metonymy. However, the responses given to the stimulus words varied in both the data sets. Collocations, as responses,

given by the Afghan learners (27 out of 120 responses) expressed common response words, such as درخت (Tree), سبز (green) for stimulus words سبز and درخت respectively. Apart from this, due to lack of orthographic knowledge, many of the Afghan students used responses in English language, such as *tea, mountains, and herbals* for the above-mentioned stimulus words. On the contrary, due to being the native learners of Urdu language, provided varied collocational responses, (42 out of 20 responses) such as *jhanda* (flag), گھاس (grass), *cheetah, Poetry,* گاڑی (car), and *Guava* for the above mentioned stimulus words.

Figure 2.
Graphic Representation of Syntagmatic Responses of L1 and L2 Urdu Learners



On the other hand, use of multiword responses (6 out of 120 responses) by l2 learners of Urdu was employed six times more than the native learners. The Afghan students used phrases, such as *easy way of communication, talking on phone, a grown up tree* for stimulus words, mobile, and درخت (tree) respectively. Urdu learners used multiword syntagmatic relation only once for the stimulus word درخت as in *tree is in front of my house.*

In a similar fashion, both the data sets exposed the employment of metonymy to the most as word responses to many of the stimulus words, such as *kitaab* (book), *Khanna* (food), *tez* (fast), *darakht*(tree), *azadi*

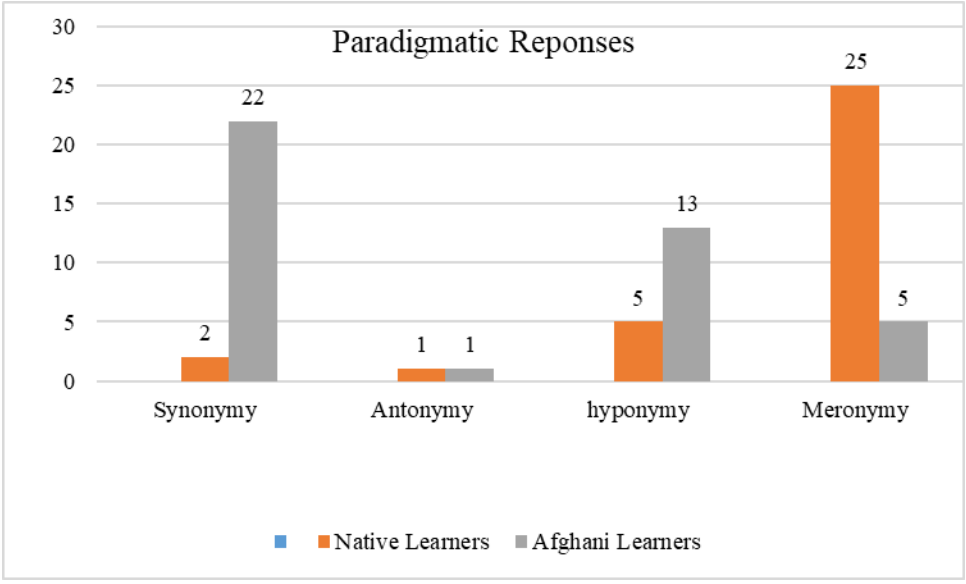
(freedom), and *parhna* (study). The Afghan students constituted 37 out of 160 responses, while on the contrary, the native learner, that is, Pakistani students gave most responses as metonymy and constituted 79 out of 160 responses. As discussed earlier (see Methodology), metonymy depicts the conceptual link with the stimulus word. Thus, the number of responses as metonymy by the native learners, being greater as compared to Afghan learners, depict a greater conceptual knowledge of Urdu language by the former.

Paradigmatic Relations

The current subsection provides insight into the paradigmatic responses provided by both set of learners. Apart from this, the data is represented graphically to provide with the most/least employed paradigmatic feature in the responses.

Figure 3

Graphic Representation of Paradigmatic Responses of L1 and L2 Urdu Learners



Among the features of paradigmatic associations, meronymy is the most common link between the stimulus and response words. It is evident from the graphic illustration above that the depiction of part-whole relation between stimulus and response word is given more by the native learners in

comparison with the Afghan learners. The native speakers provided meronyms as responses to the words, such as *kitaab* (book), *Darakt* (Tree), and *tez* (fast). The responses were *safa*(page) and *lakri* (wood). On the other hand, Afghan learners provided responses to words, such as *kitaab* (tree), *Darakt* (Tree), and *khana* (food). The provision of responses in the form of meronyms proves the learners' mental lexicon to be generating part/whole relation with the words.

Apart from meronymy, synonymy was also seen as the second most occurring paradigmatic feature. It is obvious from the graph that Afghan learners (22 out of 160 Responses) mostly responded to stimulus words with synonyms, thus providing meaning and sameness to the words. While on the contrary, it was overwhelming to see that synonym as a response was only presented twice by the Pakistani students. This less depiction of synonymy as responses by the native learners seem to highlight that their mental lexicons are developed to provide complex paradigmatic relations other than just providing sameness of words.

The paradigmatic features of antonymy and hyponymy were also associated as retorts with the impetus words. The Afghan learners responded with hyponymy 13 times out of 160 responses. Among the responses, words, such as *rice*, *kabab, and rice with beef* were linked with stimulus word *khana* (food), whereas *red* and *black* were provided as co-hyponyms to the word *sabs* (green). The native speakers provided 5 out of 160 responses in terms of hyponymy and gave response words, such as *oranges, apples, and mangoes* to the impetus word *darakt* (tree) and *iPhone 6* to the word *mobile.* Lastly, the paradigmatic feature of antonymy was also observed as a response word given by both sets of learners. However, the feature was only employed once as a response in both data sets. Both L1 and L2 learners of Urdu language gave antonym *susth* (slow) for the stimulus word *tez* (fast).

Clang Relations

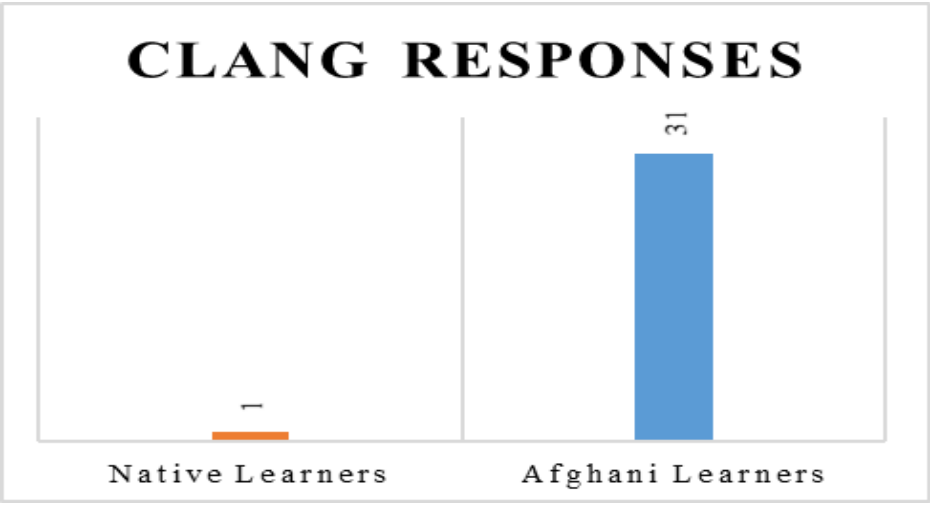
Clang responses were also a feature which was observed and obvious in the data sets. The current subsection provides with the insight of clang responses given by both set of learners.

As evident from the graphic illustration, native learners depicted 1 out of 160 clang responses by providing word, such as *likhna* (writing) for the stimulus word *parhna* (study), thus providing phonological association with

word. On the contrary, the Afghan learners used clang words as responses for 31 times. The stimulus words, such as *sabse* (green), *kitaab* (book), *tez* (fast), *darakt* (tree), and *azadi* (freedom) that were provided clang responses, such as *hara* (green), *kutab* (books), and *tezi* (fast).

Figure 4

Graphic Representation of Clang Responses of L1 and L2 Urdu Learners



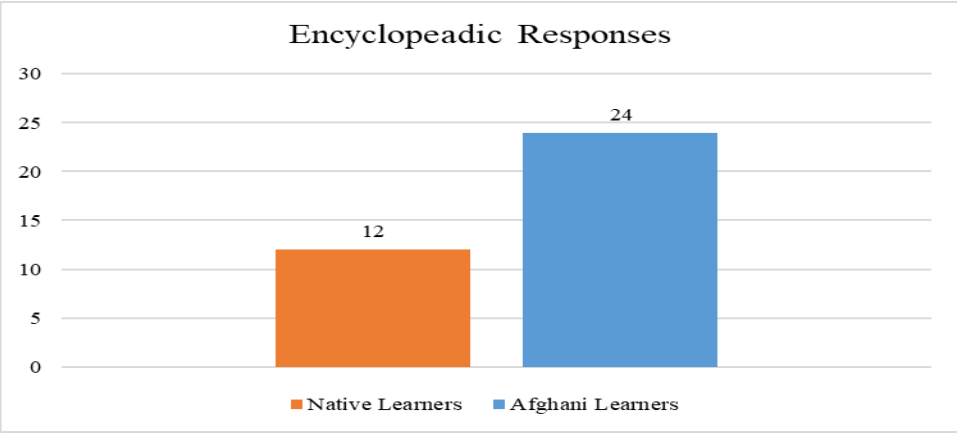
Encyclopedic Relations

The graphic representation of the encyclopedic responses depicted that the Afghan learners used world knowledge to respond to the stimulus words more as compared to the native learners. The Afghan learners responded to the stimulus word *azadi* (freedom) by providing knowledge about the freedom of their country. Similarly, Pakistani learners also responded to stimulus word *azadi* (freedom) with words, such as *subcontinent, Pakistan day, and 14th August*.

The pervasiveness of syntagmatic, paradigmatic clang, and encyclopedic features as responses to stimulus words depict that both the set of learners mentally arrange words in terms of "categories rather than taxonomies" (Harrison, 2015, p. 25). Therefore, it refers to the notion that words are arranged either in terms of their meanings (sameness/oppositeness) or in terms of their hierarchical relationship (hyponymy/meronymy) to one another.

Figure 5

Graphic Representation of Encyclopedic Responses of L1 and L2 Urdu Learners

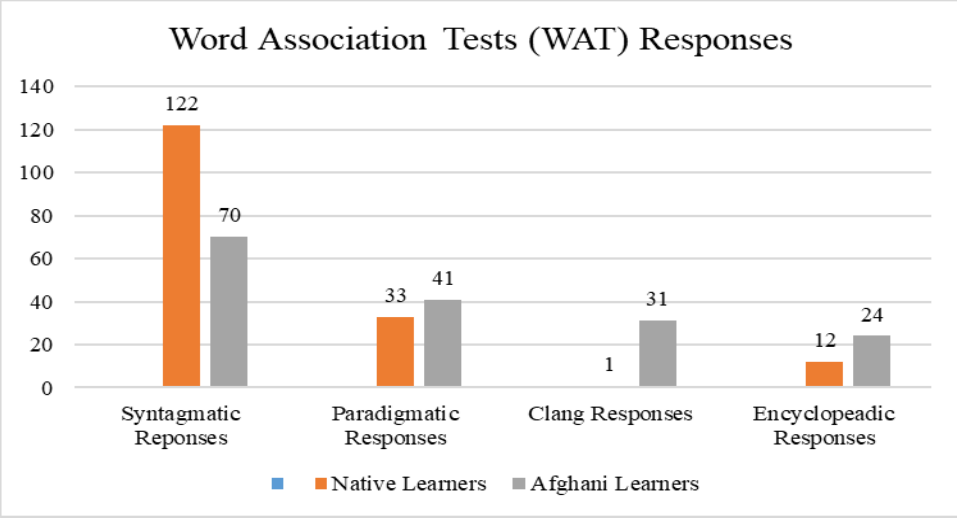


Results and Discussion

The results of the study revealed that use of word associations was evident in both the data sets. Nonetheless, the results revealed differences in the graphic illustration below.

Figure 6

Graphic Representation of Word Association Responses



It is evident from the graphic illustration that the Afghan L2 learners of Urdu language responses' mostly revealed paradigmatic relations. This

shows that there is linkage of lexical knowledge with the mental lexicon in categories rather than sequentially. This reveals the reason of less usage of syntagmatic associative responses. On the contrary, the Pakistani L1 learners reveal frequent syntagmatic responses, exposing that the higher the frequency of the proficiency of language, the higher the knowledge of grammatical sequencing would be. Apart from syntagmatic and paradigmatic relations, the use of clang words as responses by L2 learners also showed high frequency. This again expresses the lack of conceptual knowledge of the stimulus words. On the contrary, the L2 learners depicted high frequency of encyclopedic responses, thus trying to co-relate the world knowledge with the semantic relation of the stimulus words.

Conclusion

The current paper investigated the mental lexicon of Urdu L2 learners. Breaking the norms of scrutinizing English language vocabulary acquisition and process in the mental lexicon, the current research attempted to analyze the semantic associative responses provided for Urdu stimulus words. Although, the complicated and intrinsic nature of mental lexicon may provide relatively abstract features. Nonetheless, WATs provide insight into aspects of information of L2 mental lexicon (Wendari & Zaim, 2021; Xiang & Nam, 2022). Firstly, it has been revealed that L2 learners produce both syntagmatic and paradigmatic responses at higher frequency than the clang words. Henceforth, the storage of vocabulary indicates that the role of meaning is significant. Secondly, as discussed earlier, in comparison with the native speakers, L2 learners depict weak semantic association with stimulus words and response words, thus justifying the frequent occurrence of clang words in their W A responses. Finally, unfamiliarity to some of conceptually demanding impetus words, L2 learners produce more clang and encyclopedic words/responses. Apart from the substantial findings, the current study also has certain drawbacks. The major limitation of this study is that it lacks proficiency measure of L2 learners over time, thus it fails to illustrate the development of the mental lexicon. Despite this limitation, the study implies future research in the area where Urdu must be prioritized as the learning language. With the introduction of business reforms in Pakistan, such as CPEC, it is likely that Urdu would become the second language for most of the countries contributing to the business development of Pakistan. Therefore, the implications of this study for second language learners of Urdu remain significant.

References

Asgari, E., & Chappelier, J. C. (2013). *Linguistic resources and topic models for the analysis of persian poems* (Paper presentation). Proceedings of the workshop on computational linguistics for literature, Atlanta, Georgia, USA.

Çetikaya, F. Ç., Sönmez, M., & Topçam, A. B. (2020). A formative assessment example: Word association test. *International Education Studies*, *13*(8), 103-117.

Derman, A., & Eilks, I. (2016). Using a word association test for the assessment of high school students' cognitive structures on dissolution. *Chemistry Education Research and Practice*, *17*(4), 902-913. https://doi.org/10.1039/C6RP00084C

Fitzpatrick, M. C., Weltzin, J. F., Sanders, N. J., & Dunn, R. R. (2007). The biogeography of prediction error: Why does the introduced range of the fire ant over-predict its native range? *Global Ecology and Biogeography*, *16*(1), 24-33. https://doi.org/10.1111/j.1466-8238.2006.00258.x

Fitzpatrick, T., & Thwaites, P. (2020). Word association research and the L2 lexicon. *Language Teaching*, *53*(3), 237-274. https://doi.org/10.1017/S0261444820000105

Harrison, S. V. (2015). Word association: Exploring the L2 mental lexicon of Korean EFL learners. *The Asian EFL Journal Quarterly*, *461*, 8-37.

Jiang, N. (2000). Lexical representation and development in a second language. *Applied Linguistics*, *21*(1), 47-77. https://doi.org/10.1093/applin/21.1.47

Khazaeenezhad, B., & Alibabaee, A. (2013). Investigating the role of L2 language proficiency in word association behavior of L2 learners: A case of Iranian EFL learners. *Theory and Practice in Language Studies*, *3*(1), 108-115. https://doi.oeg/10.4304/tpls.3.1.108-115

Lu, X., & Lim, J. (2019). Korean EFL learners' L2 mental lexicon: Vocabulary size and word association types. *English Teaching*, *7*(4), 131-151.

Ly, T. H., & Jung, C. K. (2013). An exploration of the mental lexicon of Korean EFL learners., *6*(2), 3-28.

Marzban, A., Bagheri, M. S., Sadighi, F., & Rassaei, E. (2019). Probing into native and nonnative students' mental lexicon: A case of word association comparison. *Psycholinguistics*, *25*(2), 197-213. https://doi.org/10.31470/2309-1797-2019-25-2-197-213

McCarthy, M. (1990). *Vocabulary*. Oxford University Press.

Meara, P. (2009). *Connected words: Word associations and second language vocabulary acquisition* (Vol. 24). John Benjamins Publishing.

Moon, R. (1997). Vocabulary connections: Multi-word items in English. *Vocabulary: Description, acquisition and pedagogy*, 40-63.

Nekah, S. M. A., Akhlaghi, E., & Ebrahimi, S. (2013). An assessment of lexical sense relations based on word association test. *European Scientific Journal*, *9*(11), 383-399.

Passand, F. G. S. H. (2015). The study of Iranian EFL learners' mental lexicon through word association tests. *Journal of Educational, Health and Community Psychology*, *4*(2), 105-118.

Pranoto, B. E., & Afrilita, L. K. (2019). The organization of words in mental lexicon: Evidence from word association test. *Teknosastik*, *16*(1), 26-33.

Prihatini, A. (2020). Word association and its function at the constituent understanding on the language learning. *KnE Social Sciences*, *4*(4), 18-25. https://doi.org/10.18502/kss.v4i4.646

Roux, P. W. (2013). Words in the mind: Exploring the relationship between word association and lexical development. *Polyglossia*, *24*(8), 80-91.

Seguin, M. (2017). Exploration of the relationship between word-association and learners' lexical development with a focus on American L1 and Croatian L2 speakers. *Explorations in English Language and Linguistics*, *3*(2), 80-101.

Wendari, T., & Zaim, M. (2021, September). *Classifying word association test (WAT) response in song study at students senior high school 1 Sungai Aur*. 8th International Conference on English Language and Teaching (ICOELT-8 2020) (pp. 68-71). Atlantis Press. https://doi.org/10.2991/assehr.k.210914.013

Wharton, C. P. (2010). *Changing associations: The effect of direct vocabulary instruction on the word associations of Japanese college students* [Master thesis, University of Birmingham].

Wilkins, D. A. (1972). *Linguistics in language teaching* (Vol. 111). Edward Arnold.

Xiang, L., & Nam, H. (2022). L1 mediation in Chinese English learners' mental lexicon: Evidence from word association tests. *Language Teaching Research*, *0*(0). https://doi.org/10.1177/13621688211066017

Zhang, X., & Nannan, L. I. U. (2014). Exploring the second language mental lexicon with word association tests. *Cross-Cultural Communication*, *10*(4), 143-148.