

Semantic Change And Drift In The Urdu Language: A Critical Analysis Of Ai Translation And Large Language Models

Syeda Maryam Fatima (Corresponding)¹, Syeda Mahnoor Fatima (Corresponding)², Kokub Khurshid Abbasi³, Shabana Azad⁴

Abstract:

The study delves into Semantic Drift and A Critical Analysis of AI Translation and Large Language Models. The change in the Urdu language with special attention to how the meanings of some common words have evolved and how Artificial Intelligence large language models like the most widely used translating engine, Google Translator, fail to translate culturally appropriate meanings. Ten words were taken for analysis in this research paper to show different significant changes in their semantics from their initial use in Urdu, comprising "لوٹا" (Lota), "خواب" (Khawab), "غیرت" (Ghairat), "شہرت" (Shohrat), "حسن" (Husn), "بیہ حس" (Behas), "جاہل" (Jahil), "آبرو" (Aabroo), "شعور" (Shaoor), and "عزت" (Izzat). The study demonstrates how Urdu changes across time concerning ¹its environment, i.e. society, culture and also new words coming in. From the semantic point of view, these changes demonstrate that language is not just subject to changing conventions; it also expresses wider cultural & social transformations, including issues related with politics on both a national and international level. In addition, this research evaluates the weaknesses inherent within artificial intelligence-oriented approaches towards cross-cultural meaning interpretation and translation thereof. By so doing, we can see that there is still much which is left unknown about the development of languages and there should be some improvements done in this area in Large Language Models by feeding cultural interpretations into their deep database, taking into account all the peculiarities of different cultures and languages.

Key Words: Semantic Drift, Artificial Intelligence, Translation, Urdu Language, Culture, Large Language Models.

Introduction: Language is not static but rather a changing system that is a reflection of the culture, history, and society. The evolution of language is very interesting, especially when we consider how new meanings can be given to words or how words shift in meaning over time, i.e., semantic change and drift (Tahmasebi, N., Borin, L., & Jatowt, A, 2018,p.1810). To understand how language develops and affects people, one must first identify all factors involved in this process, including but not limited to semantic evolution. In this study, we will

¹Lecturer Department of English, University of Kotli, Azad Kashmir. maryamgardezig@gmail.com

²Writing and Editing Professional/ Proof Reader/ Student, BS Honors in International Relations, Department of Social Sciences, National University of Modern Languages (NUML), Islamabad, Professional Writing and Editorial Specialist. Email: syedamahnoor134@gmail.com

³Lecturer Department of English, Women University of Azad Kashmir Bagh. Kokub.khurshid@gmail.com

⁴Lecturer Department of English, Mohi Ud Din Islamic University (MIU) Nerian Sharif. shabanaazad4349@gmail.com

explore how certain words have changed their meaning in Urdu while passing through different ages. Additionally, it questions whether artificial intelligence-based language models can adequately adapt to such subtle variations with specific reference to the complexities surrounding an accurate translation of important cultural terms from one language into another (Mohamed, Y. A., Khanan, A., Bashir, M., Mohamed, A. H. H., Adiel, M. A., & Elsadig, M. A., 2024, p.25553-25554,).

Background: The semantic evolution can be very well studied through Urdu, which is an interesting case due to its rich literary background and mixture of many cultures. This language was born out of a blend of Persian, Arabic, and indigenous languages spoken in South Asia at around 1000 AD (Ahmad, S. 2014, p.9). Today it serves as one of the major means of expression for people living in or originally coming from Pakistan, India, Bangladesh, and even non-South Asian countries like the UK, where a considerable number speak this language for diverse reasons. The course taken by Urdu in becoming what we now know as an instrument for communication, verbal art, and prosaic discourse among a wide population across most parts of South Asia was not uniform & progressive but rather complex, giving rise to many anomalies on its way there, including those related to meaning itself.

Scholars have been studying the change in the meaning of words for many years in the field of linguistics. There is a rich history in this area, starting from the contributions made by scholars like Ferdinand de Saussure & Otto Jespersen to recent thinking by Elizabeth Closs Traugott and Eve Sweetser, among others, on what lies behind changes in meaning. Words can change meaning over time in different ways, such as metaphor, metonymy, broadening, narrowing, & pejoration; all these factors work together to bring about subtle shifts in lexical semantics (Ulugbek, R.2021,p.133).

Although there has been an extensive study on how the meanings of words change in English, French, Chinese, etc., it is surprising that no attention was given to Urdu. It, therefore, seems appropriate for one to take advantage of this gap within the literature so as to investigate how the semantics of Urdu vocabulary have changed with specific reference towards different time spans (Qureshi, M., Jadoon, N. K., & Farooq, M, 2023,p.539). This is helpful to see by looking at some examples of semantic change and drift in the Urdu language and to understand how linguistic evolution is affected by culture, society, as well as politics among the speakers of the Urdu language.

At the same time, language translation and interpretation have been transformed by artificial intelligence (AI) and machine learning models, especially large language models such as GPT-4. Nevertheless, even though they are highly advanced, these models encounter difficulties in translating words or sayings that reflect different cultures; hence, misinterpretations occur (Kaur, P., Kashyap, G. S., Kumar, A., Nafis, M. T., Kumar, S., & Shokeen, V. 2024).

Research Questions

1. How does semantic drift broaden the meanings of Urdu cultural words over time?
2. How AI translation is different from cultural interpretation of the Urdu words?

Research Objective

1. To find out how does semantic drift broaden the meanings of Urdu cultural words over time.
2. To analyze how AI translation is different from cultural interpretation of the Urdu words.

The Aim of The Study

The aim of this study is to bridge the existing gap within academic literature regarding semantic drift and change across the Urdu lexicon over time. The study intends to reveal how the meanings of words have evolved by analyzing some historical documents and literature materials as well as current language usage (Ghafoor, A., Imran, A. S., Daudpota, S. M., Kastrati, Z., Batra, R., & Wani, M. A. 202,p.9). This is done through an examination of historical texts, literary works, & contemporary usage with the intention of bringing out any changes that may have taken place in the semantics of these languages. Understanding that languages are always in a state of flux, we can see how dynamic Urdu itself can be seen as being neither separate nor separable from its changing environment.

Also under examination are the challenges that come with trying to have artificial intelligence-enabled models keep pace with semantic variations that evolve in due course.

Literature Review

The issue of semantic evolution in linguistics has been looked at by scholars for many years. Research from different academic areas has tried to explain how the meaning of words changes with time and what causes these changes. The document analyses important theories, research, & methods that help us today to comprehend semantic development within individual languages.

Many researchers have studied how words shift in meaning within different languages like English, French, or Chinese but there are very few if any, on the subject of the Urdu language alone. Hence this paper reviews already available information concerning changes in the meaning of words to set a stage for further research on Urdu.

Traditional Theories of Semantic Change: The foundation for comprehending the development of languages with time was set by the conventional semantic evolution theories established by Ferdinand de Saussure & Otto Jespersen. According to Saussure's theory of diachronic linguistics, changes in language take place when there is a continuous accumulation of relatively small changes in word meanings over a long period of time (Guy, G. R. 1996. Post-Saussurean linguistics). On the other hand, Jespersen emphasized that semantic changes are caused by analogy, phonetic change as well as an analogy (Jespersen, O. 2020, Efficiency in linguistic change. Read Books Ltd). These theories are essential since they outline some of the key driving forces behind semantic changes.

Cognitive Linguistics and Semantic Change: Semantic change is viewed differently in cognitive linguistics, whereby it considers the influence that some cognitive processes like metaphor and metonymy have on the development of language (Lakoff, G. 1988). Cognitive semantics. According to some scholars like George Lakoff & Ronald Langacker, semantic change takes place when new meanings are created as a result of mapping conceptual domains upon linguistic expressions. The position underscores how human beings reshape words using their thinking capacity; it also reveals that these shifts are adaptable and dependent on various factors in the environment (Langacker, R. W,2016,p.22).

Pragmatic Approaches to Semantic Change: The pragmatic theories on semantic change underscore context, social norms, and communication needs as key drivers of linguistic change. According to Elizabeth Closs Traugott and Richard B. Dasher, semantic change occurs regularly. Their point underlies that the development of word meaning follows certain rules that take into account such pragmatic factors as politeness, inference, and implicature. Therefore, it is evident that these two approaches give importance to interaction within a given community & certain cultural practice followed by individuals which affect the development

and progress of languages. NARROG, H. (2006). A Renaissance for Historical Semantics (EC Traugott and RB Dasher,p.554-572).

Empirical Studies in Historical Linguistics: The patterns and processes of semantic change in various languages over time have greatly benefited from empirical research in historical linguistics. For instance, the work of Sali Tagliamonte, who employed corpus methods on diachronically oriented data tracing changing senses in English vocabulary, enabled us to understand how language changes occur with respect to certain variables. It has been revealed through such studies that one cannot separate language change from history and culture (Tagliamonte, S. A. 2011).

Cross-Linguistic Studies on Semantic Change: Comparative studies on semantic change in various languages show both similarities and differences with respect to how languages evolve. For instance, Johanna Nichols & William Pagliuca's work compared the development of meaning in Russian, Chinese, and Bantu languages, among other language families; it brought out that there are certain cultural and typological issues influencing these changes. Such research spanning several languages enriches our knowledge of language-specific responses towards evolving cultural dynamics (Agwuele, A., & Bodomo, A,2018,p. 464).

The development of artificial intelligence (AI)--based language models, especially in translation, has created more areas in linguistics for exploration. Nonetheless, it is still very difficult for AI to accurately translate such terms: making mistakes while trying to translate or interpret languages. Therefore, there is a great necessity for sophisticated AI models that can tackle human language complexity (Wang, L,2023,p. 02021).

Literature Gap

There is a wide range of literature on semantic change, with little attention being paid to Urdu. Although Urdu has the same linguistics as Persian or Arabic, it still differs, making it unique for analysis. As a result, one requires observational research studying how certain words have changed their meaning over time within the Urdu language in order to understand better what are the driving forces behind the evolution of such kind among a great diversity of languages that are spoken today.

The review covers all important theories, experiments, & ways that have helped us know about how words change meaning with time in different languages. To start off with our work, we require empirical data aimed at exploring changes taking place within the semantic content of individual words in Urdu, and such a need is outlined in this paper through this literature review.

Methodology

This study uses a historical approach to examine semantic shift and drift within the Urdu language. The research intends to reveal how words changed their meaning over time by following the changes in Urdu vocabulary in space through different stages or phases of history. To carry out this process, diverse sources such as historical documents, literature, and contemporary writing were used to gather and analyze data on changes in word meanings in Urdu.

Data Collection

To begin with, a corpus of words that are in Urdu and have changed their meaning with time is compiled. In this corpus, there are samples taken from the past, literature, & what is spoken today across various genres and eras. The choice of these words depended on their relevance

to the research question, particularly those with a wide range of meanings changing with time in different cultures.

Data Analysis

To find out semantic changes in the Urdu vocabulary, data was gathered for later analysis. It undertook the examination of lexical as well as grammatical variables, focusing on what has been referred to as semantic drift or change over the course of history within these languages. In this process, attention was also given to some keywords that are particularly associated with religion, politics, or culture because these areas are known for having very complex semantics. The research investigated how artificial intelligence language models understand such terms by comparing their translations to culturally relevant ones.

Among others, the analysis consisted:

Lexical shifts: These include the ways in which meanings of words have changed over time, e.g., widening, narrowing, metaphorical extension, pejoration, etc.

Contextual analysis: It refers to an examination that takes into account all surrounding circumstances so as to draw better conclusions concerning any given point under consideration; within this project, it specifically looked at how factors like language contact, cultural exchange & ideological issues can affect meaning shift.

Interpretation and Synthesis: The results of the data analysis were explained and combined to understand how much and in what way the semantics changed within the Urdu language. For this reason, it was necessary to draw links between language structures and their evolution depending on historical, cultural & social issues to clarify the reasons behind changing meanings.

In particular, the research assessed whether AI models could be used effectively for translating such terms as those which contain some elements of culture but not all of them; thus, it suggested reasons why these models fail to completely capture the meaning embedded in words across given cultural backgrounds.

Main points covered:

- Noting similarities and differences in semantic change patterns over time across various languages & within different language families.
- What does semantic change within the Urdu language imply about their way of life, talking patterns and number of languages spoken among themselves?
- What are some other possible interpretations that could be drawn from this study regarding how languages change over time?

Limitations and Considerations: Acknowledging potential limitations in the methodology is vital. To start with, the corpus of data may not be enough to show how the Urdu language is used among different people. As a result, this could introduce some bias into our analysis. The researcher's background could also make him or her have their own view on the changing trend of words, which may not actually be true, which creates room for further misinterpretation. Be that as it may, the methodology offers a structured means of carrying out historical analyses on semantic mutability & evolution within the context of AI-translated text.

Data Analysis

Here we are qualitatively analyzing some specific Urdu words that have experienced a considerable change in meaning over time & hence drifted. Firstly, these are high-frequency

words with blatant variations in their meanings from the past till now, showing that every language is subject to development. Also, we will see what difficulties can be encountered by artificial intelligence in the translation of such terms with great cultural load.

"لوٹا" (Lota): Originally, the term "لوٹا" denoted a circular and very tiny water container that was mostly used for ablution or pouring water in South Asia. Nevertheless, in contemporary political talk, the word "لوٹا" carries a derogatory connotation and different meanings when used in isolation. More often than not, it is employed to refer to someone who changes his/her political standpoints for personal interests, i.e., a political turncoat or opportunist. The change in meaning is attributed to how people view politicians changing sides like a "لوٹا" transferring liquid from one container to another. Translation of such texts by AI models may not fully reflect this contextual information thereby missing out on an important point of critique.

"خواب" (Khawab): In the past, when looking at Urdu poems and writings, one would think of something nice when they heard the word "خواب," which can be translated as a dream or vision. Nevertheless, nowadays if someone uses the word "dream" in Urdu text, it may mean some sort of non-practical wish due to social & political reasons leading to nothing but disappointment. The term now reflects a sense of disillusionment whereby "خواب" may also stand for daydreams or castle-building. There has been a significant transformation in the sense of this word, which is attributed to socio-political variables & evolving goals among those who speak Urdu. Concerning AI translations, many models still do not take into consideration such negative meanings assigned with "خواب" and therefore fail to understand these complex issues within their context.

"غیرت" (Ghairat): In the past, the term "غیرت" was connected to principles of honor, uprightness, & self-esteem, especially within one's family or larger social structure. Nevertheless, with time it has come to have a much deeper meaning; one that is also associated with men's honor and policing women. This transformation in semantics demonstrates changing gender roles as well as overall cultural evolution specific to the Urdu-speaking community. When translated by AI models, the word "غیرت" is usually rendered as "honor"; nevertheless, such translations fail to take into account the fact that there are certain gender-specific issues & cultural peculiarities that are currently deeply rooted in this concept.

"شہرت" (Shohrat): Originally, the term "شہرت" meant that someone was well-known or had a good name. Nevertheless, in modern Urdu, "شہرت" may carry both senses of fame as well as of notoriety, especially linked with scandalous conduct. The transformation is indicative of the evolving communal perspective on fame in addition to its relationship with some public figures created by media and popular culture. Most AI translators convert "شہرت" to "fame," failing to acknowledge the unfavorable meaning attached to it in present times by many people.

"حسن" (Husn): Historically, the term حسن was used to describe beauty, especially in relation to how things look. Nevertheless, in modern-day Urdu, حسن may carry with it a sense of metaphor, i.e., moral or spiritual beauty; this shows that people now take into account more than just one kind of beauty. The expansion of this meaning has been a result of the influence of literature & philosophy within Urdu-speaking communities. Most AI models translate "حسن" to mean "beauty," although this does not take into account some of its new symbolic meanings.

"بے حس" (Behas): Originally, the term "بے حس" meant that someone was "insensitive" or "unfeeling," which is a way of saying that they had no empathy or compassion. Nevertheless, it currently refers in Urdu to a wider sense, including emotional insensitivity and an even more significant lack of concern for important social matters. This transformation indicates an increased understanding of social justice and human rights among speakers of Urdu. When

translating “بے حس,” AI models tend to provide an output equivalent to “insensitive” while ignoring its extended modern connotations.

"جاہل" (Jahil): In the past, the term "جاہل" meant being unaware or not knowledgeable, especially in matters to do with religion or morals. Nevertheless, in contemporary Urdu, "جاہل" may refer to obstinacy as well as willful ignorance — a sign of the increased condemnation of those who are seen as uninformed. Education and intelligence progress among people who speak Urdu have greatly impacted this kind of change. Many translation devices render "جاہل" by the English word "ignorant," but this does not fully express the condemnatory sense now often carried by the term.

"آبرو" (Aabroo): In the past, honor, dignity as well as respect, were what made up someone’s “آبرو”. This is especially so within the family set-up or societal values whereby if one had honor then they would be considered worthy in society (Worthen, 2014). Be that as it may, with time this term now refers to reputation or social status, showing how matters of honor have continued to develop among Urdu-speaking communities. The change in meaning from a traditional one to the other has not escaped socio-cultural factors that are linked to changes in the way people view honor both within and outside their communities. Most AI translation models render the word “آبرو” as “honor”, but this does not completely express the wider implications of social status & reputation that are now included in its meaning among native speakers.

"شعور" (Shaoor): Originally, the term “شعور” denoted consciousness or awareness, particularly from a philosophical or intellectual viewpoint. Today in Urdu, “شعور” is used to represent social and political awareness, signifying an additional sense that was not there before on matters of community involvement and human rights, among other issues for speakers of this language. The change in meaning is seen as part of the greater responsibility on education and the influence of socio-political factors on the public mind. When translated by artificial intelligence models, the word “شعور” is commonly rendered as “consciousness”; however, this does not encompass its complete connotation of social and political awareness.

"عزت" (Izzat): In history, “عزت” is a term that talks about dignity, honor, and pride, especially within the societal & family setups. With time, however, this word has also gained a meaning of its own, which is generally referred to in English as “self-respect” or “personal integrity” among Urdu-speaking societies. The latter development or change closely relates to; whereby its emergence cuts across the board due to some factors like cultural and intellectual ones stressing on individual autonomy and self-worth. Most AI models translate “عزت” to mean “honor,” but this does not fully capture how the word now includes concepts like self-respect & personal integrity in many contexts.

Discussion

From the ten Urdu words examined, it is apparent that language is not stationary. How this language has been able to evolve to be responsive within its environment through incorporating new words or modifying the meaning of ones already present is seen. Societal changes, cultural evolution, and now and again new language inventions were accommodated by Urdu language adaptability to such factors. In other words, every word was affected by a shift in meaning due to certain historical, social, & cultural issues that interact with each other. This proves once again that we should take into account not only direct but also hidden sense while communicating with people from different societies.

It goes further to bring out how much these models fail when it comes down to understanding some given facts about culture, such as certain meanings in languages, but on the other hand

provide good translations themselves. Even though there have been significant improvements in GPT-4 & other similar AI models concerning their understanding of languages, they still miss out on the most important thing about culture when doing translations with such devices as this one. This becomes visible when trying to translate difficult words having long cultural backgrounds, for instance, “لوٹا”, “غیرت”, & “عزت” since artificial intelligence usually offers shallow interpretations, neglecting the underlying message carried out by these terms.

AI-driven models face a great challenge due to their inability to incorporate cultural knowledge & understand context in their operations. Although these models have been trained with enormous amounts of data, it is still important to note that they may have very limited information within the training corpus used about some cultural or historical aspects related to language evolution. This is because most AI modules do not understand the meaning of words but follow statistical patterns while giving translations, which may have some technical merit but not fit into the target culture.

In this research, it is argued that even though AI-driven models can be used effectively as language translators, they cannot entirely substitute human interpreters, especially in environments that require a high level of cultural & contextual analysis, such as high-profile political and international meetings. Therefore, there is a need for further research calling for improved artificial intelligence so that it may accommodate and process human language better, taking into account cultural as well as contextual factors therein.

Results

The study established that semantic change and drift are very common in the Urdu language, meaning that now and then one may fail to carry information from one language into another. It was seen that several well-known words which are still being used currently have undergone some changes in their meanings over time when each is translated from English to Urdu. The analysis of how the meaning of words has changed over time in the Urdu language shows that several well-known words still used today do not mean the same thing anymore as they did in the past. These semantic shifts do not only portray changing linguistic practices but also indicate wider transformations within society, such as cultural revolutions or political reformation, among others. From this, we understand that there is no set meaning for words; rather, these meanings change & develop depending on various factors within different environments, e.g., social setting, historical background, etc.

The change is a result of the evolving factors that determine the appropriateness and, conversely, what is acceptable within society. Also, at times words may change meaning or lose their meaning because speakers decide to do so for some reasons. Further investigation on this matter is necessary.

Artificial intelligence (AI) driven models face a great challenge in understanding words in their cultural context due to the dynamic nature of language. The research also shows how important it is to translate languages while being considerate about culture.

Although AI models can give accurate translations most of the time, they usually overlook some important nuanced factors that would help in understanding, such as cultural or contextual subtleties. This becomes apparent when trying to translate culturally rich words with complicated evolution. In such cases, artificial intelligence systems end up providing direct word-to-word translations that ignore underlying cultural significance.

Conclusion

The study focused on how the meanings of some words in Urdu have changed over the years, otherwise known as semantic drift and shift. It followed ten Urdu words across different historical periods to demonstrate that language changes continually; particularly when trying to understand deep cultural meanings, one may face certain difficulties with AI language models. In general terms, this work helps people see that languages do develop & change and also raises questions about the capabilities of artificial intelligence (AI) when it comes to understanding natural languages. As a result, there is a need for sophisticated translation systems that can take into account such issues in translations.

The research emphasizes the importance of carrying out more research on semantic change mechanisms & developing AI models that are capable of understanding intricate human languages better. These AI-driven models need to keep pace with changing aspects within society, such as culture, and history, among other factors that have an impact on language use because language continues evolving naturally. In doing so, they should be in a position to give translations that, apart from being correct, will also make sense at a deeper level across different cultures & societies.

In the future, it would be important for research to increase the study's scope by considering more Urdu words and different linguistic topics. Such research should be interdisciplinary & draw upon theoretical perspectives from cognitive science, artificial intelligence, and linguistics so that advanced models may be obtained for both translation and interpretation processes, including their evolution aspects in human languages. This will help us move around better when we have to deal with complex issues like cross-cultural communication and, at the same time, continue making progress in enhancing artificial intelligence technology.

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