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Possessive Constructions and Code-Switching among Speakers of Pakistani English

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Dedication

To my parents for their unconditional love and support.

Abstract

This study aims to investigate the preferred possessive agreement forms among Pakistani English speakers in code switched mode, examining whether preferences align with the Matrix Language (ML) or Embedded Language (EL) of the possessor or possessum. It also investigates the relationship between reaction time and agreement patterns in ML vs. EL contexts, alongside the influence of extralinguistic factors such as language proficiency and code-switching habits. Finally, it assesses the role of animacy, particularly with human possessors, in shaping agreement preferences.

This study examines possessive agreement preferences in code-switching among native Urdu speakers in Pakistan with English as an L2, aged 18-25. Using the Matrix Language Framework as its theoretical foundation, the study employs a language background questionnaire and a Forced Choice Task (FCT) to examine participants agreement patterns, reaction times, and influences of language proficiency and animacy.

The findings from the Forced Choice Task offered strong support for the prediction that participants overwhelmingly adhered to the Matrix Language (ML) agreement patterns when the possessive structure was expressed in the ML. Faster RTs were also observed when participants followed the agreement patterns of the ML compared to the Embedded Language (EL). The results also reveled that animacy strongly influences gender agreement patterns, with English as the ML showing object-based agreement for animates and Urdu showing stronger adherence to gender norms for animate nouns but variability for inanimates. Lastly, the study of agreement patterns with extra linguistic variables such as proficiency, frequency of language mixing and code switching habits revealed that while these variables plays a role in determining possessive agreement patterns, individual variability and factors such as cross-linguistic influence are also significant.

Keywords: Code-switching, Possessive Agreement, Matrix Language Framework, Matrix Langauge, Embedded Language, Forced Choice Task.

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Chapter 1 Introduction

Code-switching, which involves alternating between two or more languages in a conversation or within a sentence, is a common occurrence in bilingual and multilingual communities. The notion of code-switching was first introduced by Einar Haugen in 1950 and Uriel Weinreich in 1953. It is referred to by different names such as language switching, language mixing (Crystal, 1997), code mixing, language interlarding, or integration (Kebeya, 2013). This phenomenon takes place in environments where bilingual speakers interact (Cook, 2008). It can happen in various social contexts, including casual discussions, educational settings, and workplaces. Code-switching is not an indication of linguistic inadequacy or confusion; instead, it showcases the speaker's skill in maneuvering between languages and making use of the linguistic resources at their disposal. Studies have indicated that code-switching can be influenced by various factors, including changes in topic, the social environment, or the necessity to convey a message more effectively in one language compared to another (Muysken, 2000). In numerous bilingual communities, speakers might unconsciously switch languages due to pragmatic, cultural, or linguistic reasons, highlighting it as a valuable topic for linguistic research.

Pakistan offers a prime example of a bilingual society where code-switching is common. According to the constitution of Pakistan Urdu is the national language of the country (Article 251 of the 1973 Constitution of the Islamic Republic of Pakistan) along with English which was supposed to continue as the official language of Pakistan till such time that the national language(s) replaced it but until now no replacements have been made and English is continued to be used as the official language. Given the official status of English language, it is used as the primary language of instruction in the schools along with Urdu. Hence, with Urdu and English being the dominant languages of formal communication and various regional languages coexisting, Pakistanis frequently switch between languages in daily interactions. English which is the language of education, law, and governance is often mixed with Urdu and local languages in speech especially among educated urban speakers. This phenomenon is particularly prominent in Pakistani English, a unique variety shaped by language mixing. As a result, code-switching in Pakistan serves multiple communicative functions i.e. from representing social status and educational background to navigating the distinct cultural identities associated with each language (Mahboob, 2004; Rahman, 2010). The popularity of

code-switching highlights the complex interplay between language, identity, and society in Pakistan.

1.1 Area of Investigation

Possessive agreement which is the relation between possessive markers and the nouns they modify, is an important issue in multilingual populations. As individuals navigate multiple languages, the ways in which they manage possessive structures can reveal significant interactions and influences between these languages. This aspect of linguistic study is essential for understanding how different linguistic systems affect each other. With English as a language that exhibits agreement between the possessive pronoun and the possessor while Urdu shows a relationship between the possessive pronoun and the possessee, this study investigates the possessive agreement that exists as the participants code-switch.

The current study uses the Matrix Language Framework as its theoretical framework. The Matrix language framework was first introduced in Myers Scotton (1993) and has been refined over the years. The MLF model is based on three fundamental concepts: the distinction between the matrix language and the embedded language, the differentiation between system morphemes and content morphemes, and the core principles of the MLF model.

A group of 30 participants, residing in Pakistan were targeted for this study with age group ranging between 18 to 25 years of age. All participants were native speakers of Urdu with English as their second language.

1.2 Objectives of the Study

The main objective of this study is to identify the preferred forms of possessive agreement among speakers of Pakistani English and to determine whether this preference comes from the Matrix Language or the embedded language of the possessor or possessum. The current research also aims to explore the relation of reaction time and possessive agreement with the Matrix and the Embedded language. Additionally, the research examines various extralinguistic variables to assess whether preferences for specific agreement patterns were influenced by factors such as language proficiency and code-switching habits. Finally, the study also investigates the role of animacy in possessive pronoun agreement, considering whether the presence of a human possessor affects the agreement relationship.

This thesis is structured as follows: the next chapter i.e. chapter 2 introduces the theoretical background, including the Matrix Language Framework, and discusses possessive agreement in English and Urdu Language along with the research questions of the study and their predictions. In chapter 3, the design of the study and the data collection methodology has been outlined. In chapter 4, the results of this study are presented through graphs and charts. Lastly, Chapter 5 gives a detail discussion of the results and conclusions based on the research questions and the predictions.

Chapter 2 Background of the Study

This chapter will deal with a detailed background about possessive constructions in English and Urdu Languages followed by an account on Matrix Language Framework and its relevance with the current study. Lastly, this chapter will also hold a detailed description of the three research questions along with predictions for some possible outcomes.

2.1 Possessive constructions and their agreement in English and Urdu Languages.

Possessives can be defined as determiners that indicate property or affiliation (Faarlund et al., 1997). The primary function of possessive constructions is to express a relationship of ownership or association between entities. This relationship can be direct and therefore indicate physical ownership (e.g., "John's car"), or it can be abstract, indicating a relationship or association (e.g., "The child's victory"). Essentially, possessive constructions answer the question "Whose?" regarding an object, attribute, or entity (Lyons, 1999).

Grammatically speaking one can break down possessives into three basic constituents, the possessor, which is defined as an entity that owns something, the possessum or the possessed, the entity that is owned or had by the possessor (Fabricius-Hansen et al., 2017), and the possession marker, which indicates the relationship between the possessor and the possessed.

Languages vary in how they handle possessive constructions, especially in terms of whether the possessive marker or pronoun agrees with the possessor or the possessum. In English language possessive agreement exists between the possessive pronoun and the possessor. It determines person, number, and gender semantically. In Urdu, possessive agreement mainly depends on the possessum rather than the possessor. The possessive markers (کا, کی, کے – ka, ke , kay) change based on the gender and number of the possessum whereas the possessor remains constant. For example in;

1 (a). Ali-ka Qalam.

Ali's pen.

(b). Aisha-ki kitaab.

Aisha´s book.

In 1(a). *qalam* is masculine, and in 1(b). *book* is feminine and the possessive marker *ka* is used for a masculine noun such as in 1(a) and *ki* is used for fem noun such as in 1(b). In the English language on the other hand the possessive pronoun agrees with the possessor. The gender and number of the pronoun changes based on the gender and number of the possessor, not the object being possessed e.g.

2(a). He lost his keys.

(b). They found their keys.

The possessive pronoun *his* is used in 2(a) because the possessor is male. In 2(b), the number of the pronoun changes based on the number of the possessor, *their* is used because the possessor is plural. The study of such an agreement relationship i.e. between possessive pronouns during Urdu-English Code Switching is going to be the focus of this study.

2.1.1 Possessive agreement in English

The English language, like many other Germanic languages, uses several alternate ways of expressing possession; the most used structures, however, are the pre and post-nominal possessives (Börjars et al., 2013). Börjars further explains that the most contrasted possessives are the *s*-possessives and the *of*-possessives, also referred to as nominal possessives (Börjars et al., 2013) e.g.

3(a) . My friend'**s** bag.

(b). The bag **of** my friend.

Barker (1998) explains the *s*-possessive to be pre-nominally realised with the **s** marker as shown in (3a), while the *of*-possessive occurs post-nominally with **of**, combining with the possessum to form a nominal phrase as shown in (3b) (Börjars et al., 2013). In this thesis, the focus will be on the first type of possessive structure. Now let us look at possessive agreement with respect to person, number and gender.

Person	Number	Gender	Pronoun	Example
1st	Singular	-	My	This is my book.
	Plural	-	Our	This is our book.

2nd	Singular	-	Your	This is your book. These are your books.
	Plural	-		
3rd	Singular	Mas	His	His book is in the bag.
		Fem	Her	Her dress is pretty.
		Neuter	Its	The cat licked its paw.
	Plural		Their	Their cat is sitting on the couch.

Table 1 – English possessive pronouns with respect to person, number and gender.

The English language exhibits semantic agreement between the possessive pronoun and the possessor (Agirre & García Mayo, 2018). It encodes person, number, and gender semantically. Person indicates the relationship between the possessor and the speaker (first person), the addressee (second person), or others (third person). Number specifies if the possession is by one individual (singular) or by multiple individuals (plural). Lastly, English does not have grammatical gender, and there are no syntactic rules that explicitly refer to gender so instead gender is expressed semantically in English language. However, English does express biological gender—specifically, gender of a semantic nature (Solyom, 2023). In English, third-person singular possessive adjectives and pronouns distinguish between masculine (his), feminine (her), and non-human or neutral (its) characteristics based on the gender and animacy of the possessor. *His* is used for masculine possessors and *her* is used for for feminine possessors while *its* is used for non-human or inanimate entities. This system describes how English marks gender only in the third-person singular, reflecting the natural gender or animacy of the possessor (the subject) rather than the possessum (the object possessed), distinguishing between masculine, feminine, and non-human characteristics in third-person singular possessive adjectives and pronouns (Agirre & García Mayo, 2018). This distinction is illustrated in third-person singular pronouns, as shown in examples 4(a-b).

4 (a). He is talking to *his* mother.
(b). She is talking to *her* mother.

(Agirre & Garcia Mayo 2018: 207–208)

The features of possessive pronouns are summarized in Table 1. The features of possessive pronouns can be summarized by saying that in English language, the gender system is semantic, meaning it aligns with the natural gender of the possessor. The third-person singular possessive determiner (his or her) agrees with the natural gender of the possessor and this gender agreement specifically applies in the third-person singular form (Agirre & García Mayo, 2018).

These are the types of possessive structures and the types of pronouns that the current study will investigate in code-switching in contact with Urdu, which, as we will see in the next section, has a different type of agreement system in possessive structures.

2.1.2 Possessive agreement in Urdu

In Urdu, the relationship between the possessor and the possessee is mostly described by the use of possessive pronouns and the genitive marker. This relationship reflects the association between two entities, usually indicating who owns or is associated with what. Two very common possibilities of expressing possession in the Indo-Aryanian Language, Urdu is a) the use of genitive case marker and b) the *ezafe* construction (Börjars, Denison, & Scott, 2013) e.g.

5(a) Yasin-ki gari
YasinM.Sg-GEN.F.Sg car.F.Sg
'Yasin's car'. (Börjars, Denison, & Scott, 2013)

(b) Sahib-*e* takht
Owner.M.Sg-Ez throne.M.Sg
Owner of the throne.

Among the case markers in Urdu, the genitive is an exception in that it is the only one which inflects for number and gender (Bogel & Butt, 2013). The genitive case marker in Urdu is used for several different constructions (Platts, 1909), the two conditions relevant to this research include:

i. The use of genitive to express relations:
Nadya-ka beta
Nadya.F.Sg-Gen.M.Sg son.M.Sg
'Nadya's son'. (taken from Bogel & Butt, 2013)

ii. The use of genitive to express *possession* i.e. possessive genitive denoting a thing owned by possessor (Bogel & Butt, 2013):

Larki-ka ghar

Larki.F.Sg-G.M.Sg gharM.Sg

'Girl's house'.

In Urdu, the genitive case is employed to demonstrate possession or a relationship like the English possessive *'s* or *of*. This forms a structure where the possessor comes before the possessive particle, which is then followed by the possessed noun. This creates a structure where the possessor precedes the possessive particle, which in turn precedes the possessed noun. The key particles are "کا" (ka), "کی" (ki), and "کے" (ke). These key particles are possessive markers that indicate ownership or association. These particles help to show the relationship between the possessor and the noun they possess, with variations depending on the gender and number of the noun. Their usage depends on the gender and number of the noun they modify. The possessive marker "کا" (ka) is used with singular masculine nouns e.g: Ali-*ka* ghar (Ali's house), here ghar is a masculine noun. "کی" (ki) on the other hand is used with singular feminine nouns e.g. Maryam-*ki* kitaab (Maryam's book), here kitaab is a feminine noun. Lastly, the possessive marker "کے" (ke) is used with plural nouns (regardless of gender) e.g. in: Ali-ke dost (Ali's friends), dost is a plural noun. It is also used with honorific singular nouns (typically masculine) e.g. in: aap-*ke* walid (Your father).

The Urdu language uses possessive pronouns such as "mera" (my), "tumhara" (your), "uska" (his/her/its), and "hamara" (our), it also uses some other poseessive pronouns such as "apna," "apni," and "apne." The pronouns "mera" (my), "tumhara" (your), "uska" (his/her/its), and "hamara" are used when the subject of the sentence is also the possessor of the noun. They show that the possession is related to the subject of the sentence. These pronouns, for example meri (my) occur in sentences where possession is expressed without necessarily linking it back to the subject of the sentence, such as in 6(a) and 6(b):

6(a) Ye meri kitaab hai.

This my.Sg.Poss.F book.Sg.F is

This is my book.

6(b) Ye uska beta hai.

This his/her.3Sg.Poss childN.Sg.M is

This is his/her son.

6(c) Ye hamara ghar hai.

This our.Poss.1Pl houseN.Sg.M is

This is our house.

The pronouns "apna", "apni" and "apne" on the other hand relate possession to the subject in a sense that they indicate a close relation with the subject but agree with the object noun of the sentence reflecting its gender, number, and case. For example, in 6(d) and 6(e):

6(d) Admi-ne apna beta daikha.

Man own POSS.M.Sg son NOM.M.Sg saw 3Sg.M

The man saw his own son.

6(e) Maa-ne apni beti-ko chooma.

Mother own POSS.F.Sg daughter NOM.F.Sg kissed 3sg.M

The mother kissed her own daughter.

This study focuses particularly on the distinction of "apna" and "apni" pronouns which change based on the gender of the object noun. Now let us look at the possessive agreement of these pronouns in Urdu with respect to person, number and gender provided in Table 2, the table shows the third person forms only since that are the forms we are looking at in this research.

Gender Num	**3rdPerson Sg**	**3rdPerson Pl**
Masc Sg	Ye *uska apna* kamra hai. This is *his/her own* room.	Ye *unka apna* kamra hai. This is *their own* room.
Fem Sg	Ye *uski apni* kitab hai. This is *his/her own* book.	Ye *unki apni* kitab hai. This is *their own* book.
Masc Pl	Ye *uskay apne* dost hain. These are *his own* friends	Ye *unkay apne* dost hain. These are *their own* friends.
Fem Pl	Ye *uski apni* sahailiyan hain. These are *her own* friends.	Ye *unki apni* sahailiyan hain. These are *their own* friends.

Table 2 – Urdu possessive pronouns with respect to person, number and gender.

2.2 Possessive Agreement in Multilinguals

Possessive agreement as discussed earlier, is the relation between possessive markers and the nouns they modify, is a crucial issue in multilingual populations. As individuals navigate multiple languages, the ways in which they manage possessive structures can reveal significant interactions and influences between these languages. This aspect of linguistic study is essential for understanding how different linguistic systems affect each other. The current

study probes into this very aspect by looking at a multilingual population of Pakistani speakers with Urdu as their native language and English as their L2, investigating the possessive agreement that exists as the participants code-switch. This section will review some relevant literature that provides evidence and insights into how possessive agreement functions in multilingual contexts, highlighting its importance and implications.

Pozzan and Anton-Mendez (2017) conducted research titled "Similarities and Differences Between Young Monolingual English Learners and Adult Mandarin–English Second Language Learners," which explored how young monolingual English-speaking children and adult Mandarin-speaking individuals learning English manage gender agreement in possessive constructions. The findings revealed that both groups frequently exhibited deviations where the gender of the possessive pronoun (e.g., his or her) corresponded to the gender of a nearby noun (such as "sister") rather than the intended possessor (for instance, "Katie"), like for example, instead of saying:

7(a). Katie gave a present to her brother.

the participants said:

7(b) Katie gave a present to his brother.

By doing so the participants used "his" mistakenly matching it with the nearby noun "brother" rather than the intended possessor, Katie. Another example provided by Pozzan & Anton-Mendez (2017) in this study is for when the possessor Masculine like e.g. John. In this situation instead of saying

8(a) John gave a present to *his* sister.

(with "his" referring to John), the participants sometimes said:

8(b) John gave a present to *her* sister.

where the possessive "her" matched the gender of the nearby noun "sister" rather than John.

These deviations occurred more often when there was a mismatch between the gender of the possessor and that of the adjacent noun. Notably, although these deviations were prevalent in spoken language production, they were significantly less common in comprehension, particularly among adult learners. This observation implies that such

deviations may primarily stem from the difficulties associated with language production rather than a lack of understanding of grammatical rules.

Studies about gender agreement in possessives has also been studied diversely. Many bilingual studies, particularly involving languages with grammatical gender like Spanish, French, or Italian, indicate that speakers often struggle with possessive gender agreement when learning a language like English, which does not have gendered possessives. **Jesús-Ortiz and Calvo-Ferrer (2023)** conducted a study which examined how Spanish speakers learning English as a foreign language manage gender agreement in possessive determiners. The study particularly emphasized on the impact of their first language (L1). They created 120 short stories to find out the relationship between English proficiency and the application of possessive determiners (his/her),. They did so also to determine if gender agreement between the possessor and the possessum affects the frequency of errors. Among these stories, 80 were designed as a stimulus to trigger the use of possessives, evenly divided between animate (e.g., people) and inanimate (e.g., objects) nouns. Half of the stories had matching genders for the possessor and possessum and the other half presented mismatched genders. The remaining 40 stories were used as fillers. Participants were shown images of individuals or objects, and sentences were formulated to assess both gender agreement and mismatches. The findings of this study indicated that Spanish speakers make gender agreement errors frequently in English, particularly where the genders of the possessor and possessum do not align, irrespective of their level of English proficiency. So, for a question taken from the story like, *Who did Biran go to the mall with?*. The participants answered:

9. Brian went to the mall with *her* sister.

The expected answer was, *Brian went to the mall with <u>his</u> sister*. So, the participants made an error by using *her* instead of *his*. These deviations were recognized as due to the syntactic transfer from Spanish to English, as both languages have different rules for possessive agreement. The study also found that while advanced learners make fewer mistakes overall, proficiency does not significantly reduces the number of errors in sentences requiring feminine possessive determiners.

Lago et al. (2019), conducted a study on "Possessive Processing in Bilingual Comprehension" which investigated how second language (L2) learners process gender agreement in possessive pronouns, specifically in German language. They investigated the

differences between Spanish and English learners of German to find out the extent to which their first language (L1) affects their understanding of possessive constructions. The study focused was on whether these second language (L2) learners who speak Spanish and English, are able to predict the gender of nouns based on possessive pronouns and whether these predictions are made due their native language. In German, the possessive pronoun agrees with both the possessor and the possessee in terms of gender. The findings indicated that participants found it easier to process possessive pronouns in conditions where there was a match in gender compared to those with a mismatch. For example, in the match condition, where both the possessor and the possessee were masculine (e.g., "seinen" and "Knopf") in 10(a), learners were quicker to anticipate the subsequent noun. Conversely, in the mismatch condition, such as "ihren blauen Knopf" (with a feminine possessor and a masculine possessee) in 10(b), learners encountered delays and challenges.

10(a) Klicke auf *seinen* blauen Knopf.

Click on *his* blue button.

10(b) Klicke auf *ihren* blauen Knopf

Click on *her* blue button.

This study investigated whether Spanish speakers, who are accustomed to gender agreement in possessive forms, would be more inclined to guess the gender in German possessive structures than their English-speaking counterparts. Contrary to what was expected, the findings revealed no significant difference between the two groups. Spanish speakers typically experience gender agreement between the possessor and the possessed item. On the other hand, English speakers, do not required gender agreement in possessives, may encounter greater challenges in a language like German in which possessive pronouns do require gender agreement. The study pointed out that both Spanish and English speakers came across comparable difficulties in processing gender within German possessives, meaning that the issues related to gender agreement in possessive constructions may exist not solely from first language transfer but also from broader cognitive processing requirements.

The studies mentioned above, along with many others in the field indicate that possessive agreement in multilingual populations is a significant area of linguistic inquiry. They demonstrate how learners with distinct possessive agreement patterns in their native languages,

often transfer these rules when learning English which results in deviations. This direction of inquiry is particularly relevant for speakers of languages like Urdu, which also has gender agreement patterns that could influence English possessive constructions. As suggested by the above mentioned researches these patterns can lead to deviations when possessors and possessums in English do not align with the agreement patterns from the learner's native language. The current study aims to contribute to this area in multilingual research by focusing on the Pakistani population, specifically individuals whose native language is Urdu and whose second language is English. By examining how Urdu-English speakers handle possessive constructions, this study will provide insights into the effects of switching and deviations made by learners, which will further highlight the relevance of this linguistic phenomenon i.e. code-switching in multilingual populations.

2.3 Matrix Language Framework (MLF) & Code-switching

2.3.1 An overview of Matrix Language Framework w.r.t Urdu-English Code-switching

As mentioned in the previous chapter, the framework used for this research will be the Matrix Language Framework. The Matrix language framework was first introduced in Myers Scotton (1993) and has been refined over the years. The MLF model is based on three fundamental concepts: the distinction between the matrix language and the embedded language, the differentiation between system morphemes and content morphemes, and the core principles of the MLF model. Now let’s look at these three concepts one by one:

1. **The matrix and the embedded language:**

Myers Scotton (1993) is of the view that the languages involved in code switching do not participate equally. One of the languages establishes the grammatical frame for the structuring of the clause (word order), this frame-setting language is the Matrix Language, or the ML, while the other is the Embedded Language (EL), which is the language that is embedded within the ML (Ouahmiche, 2011). Mwandije (2004), while discussing this claim made by Myers Scotton, argues that the ML is the language that contributes more morphemes (both bound and free morphemes) and the one that marks the tense, aspect and agreement of the sentences in question. On the other hand, the term EL refers to the other languages that have elements inserted in code switched sentences. Let us take an example from Mwandije (2004) where he explains this claim:

7. **Delegates** wa-ambi-we wo-ende **home**.

(Let someone tell the delegates to go home) (Mwandije, 2004)

Mwandij (2004), expands on this example, explaining that English serves as the Embedded Language (EL) while Kiswahili functions as the Matrix Language (ML). This division is based on the fact that Kiswahili contributes five morphemes, whereas English only contributes two morphemes ("delegates" and "home"). Mwandij (2004) also notes that Kiswahili is responsible for marking tense and agreement in the sentence. For instance, "wa" in "waambiwe" agrees with the plural form of animate nouns like "delegates," as does "wa" in "waende."

2. Content and system morpheme distinction:

Another distinction made by Myers Scotton (1993) in her MLF framework which is crucial in identifying the ML is the content and the system morpheme distinction. The distinction between content and system morphemes is essential in identifying the matrix language (ML). Content morphemes are words that carry the core meaning of a sentence. These words include nouns, verbs, adjectives, and some prepositions. In contrast, system morphemes are grammatical elements that connect content morphemes and structure the sentence. They include function words (like conjunctions and determiners) and inflections (like verb endings and case markers). This distinction is further developed into what she terms the ‘4M model’, which is summarized in Figure 1.

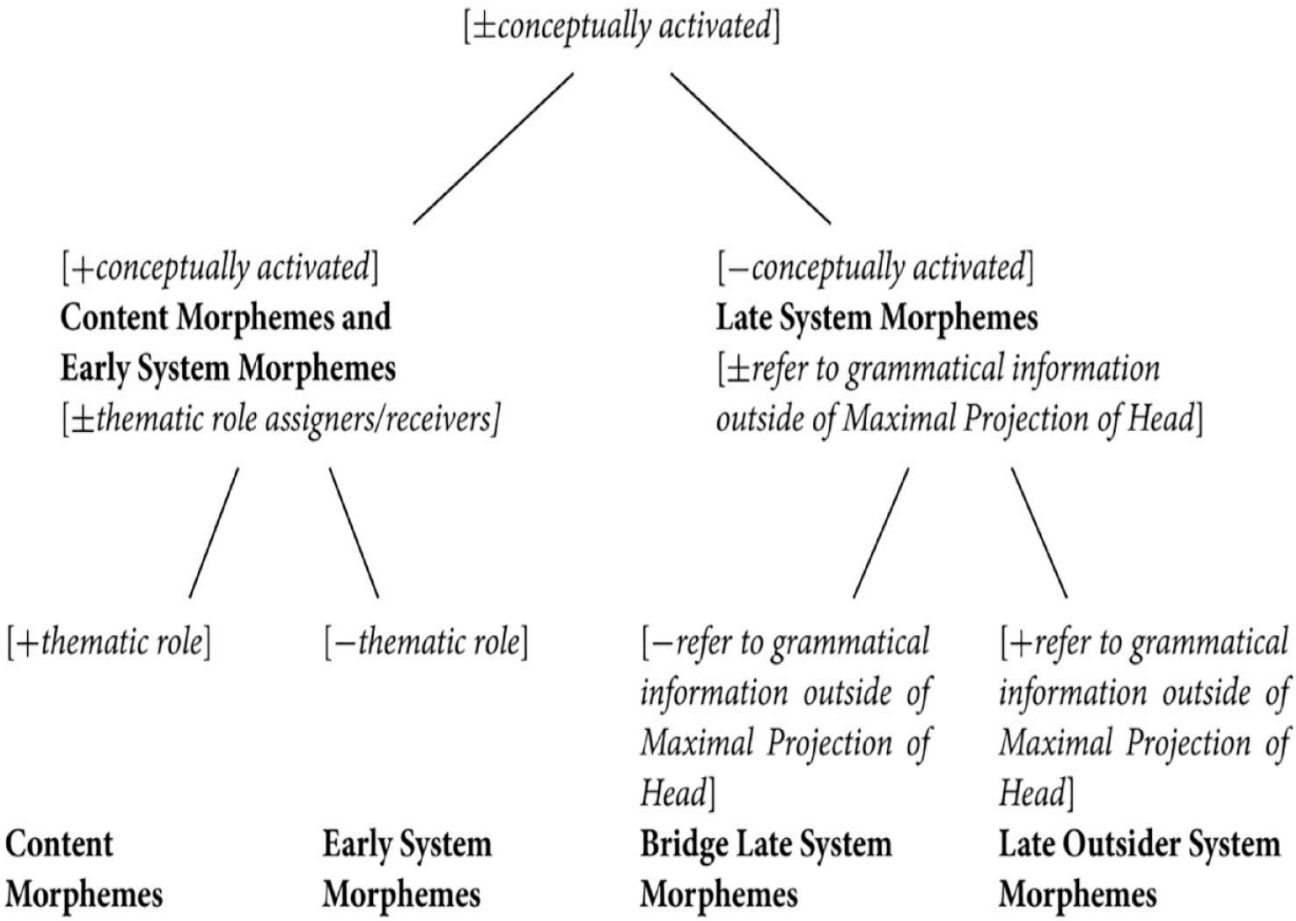

Figure 1. Different types of morphemes in the 4M model, (Myers-Scotton, 2002).

In this model, Early System Morphemes are activated by meaning and they indicate the speaker's intention, like determiners and plural markers in English (Myers-Scotton & Jake, 2000b). Late System Morphemes, on the other hand, don't need to be activated by meaning, such as verb agreement. Bridge Morphemes, like the possessive "of" and "'s" in English, help connect morphemes into larger phrases (Myers-Scotton & Jake, 2000a). However, the most important System Morphemes for identifying the Matrix Language (ML) are Late Outsider System Morphemes. According to Myers-Scotton and Jake (2000a), these morphemes rely on information outside their immediate structure, like subject-verb agreement and case affixes.

This discussion finally leads us to the two principles proposed by Myers Scotton (1993) to identify ML, the morpheme-order and the system-morpheme principle.

3. Morpheme-Order vs System-Morpheme Principle

Morpheme-Order Principle: In ML+EL constituents which consist of single EL lexemes insertions and any of ML morphemes, surface morpheme order will be that of the

ML (Myers Scotton, 1993). In other words, the grammatical structure and the sequence of words are dictated by the matrix language in this case.

System Morpheme Principle: In ML+EL constituents, all system morphemes which have grammatical relations external to their head constituent will come from the ML (Myers Scotton, 1993). While mentioning about grammatical relation external to their head constituents, Myers Scotton (1993) refers to the grammatical elements that are not part of the core lexical meaning of a word or phrase but are necessary for the sentence's overall grammatical structure. These elements govern how words interact within the sentence. So, the System Morpheme Principle dictates that system morphemes, which provide grammatical functions rather than lexical meaning, come from the matrix language. These include function words (like conjunctions and determiners) and inflections (like tense markers, plural forms, etc.).

Many researches have used the Matrix Language Framework as a theoretical basis for examining Code Switching in bilingual environments. Deuchar (2006) performed a study aimed at determining whether Welsh-English bilingual discourse follows the MLF model by analyzing informal dialogues. The findings pointed out that Welsh functioned as the predominant Matrix Language (ML), governing the morphosyntactic structure in the majority of bilingual clauses. A similar study that aligned with Deuchar's findings was conducted by Moradi (2021), focusing on Persian-English intra-sentential code-switching. Moradi (2021) concluded that Persian acted as the ML, establishing the grammatical framework, while English provided the content. This research further supported the MLF model, as Persian dictated the morphosyntactic structure such as word order and grammatical components like determiners. Abdulaziz (2014) investigated Tamazight-Arabic code-switching during a Berber news broadcast. This study identified Tamazight as the ML as it influenced the grammatical structure whereas Arabic served as the Embedded Language (EL) by supplying the content words.

Based on the information, research, and framework model presented in this chapter, the study focuses on the use of possessive constructions among the Pakistani English-speaking population in code-switched context.

2.4 Research Questions and Predictions

2.4.1 Research Questions

1(a) Which possessive agreement or form is preferred among the users when they code-switch? Does the preferred agreement come from the Matrix language or from the embedded language of the possessor or the possessum is in that language? When English is the ML, does the

presence of an Urdu possessum lead to a preference for the Urdu agreement pattern? Equivalently, when Urdu is the ML, does the presence of an English possessor lead to a preference of the English agreement pattern?

(b) How does alignment with the Matrix Language (ML) versus the Embedded Language (EL) affect reaction times and error rates in possessive agreement among bilingual Urdu-English speakers?

2. Is the preference for the agreement pattern determined by extra-linguistic variables such as proficiency and Code-Switching habits?

3. What role does animacy play regarding what the possessive pronoun agrees with? Does having a human possessee make any difference in the agreement relationship?

2.4.2 Predictions

1a. For the first research question. It can be predicted that the most used or preferred agreement structure will come from the Matrix language as suggested in the MLF. The matrix language usually decides the syntactic structure of the sentence, including agreement patterns. Thus, if Urdu is the matrix language, it is likely that agreement forms will follow Urdu's grammatical rules and vice versa for English language. To explain through an example let us take two sets of sentences for English and Urdu with different possessives.

1. Urdu as Matrix Language with English as EL

We can take the set of examples in (8a-b) to explain this prediction

8(a) Baap-nay *apni* daughter-ko chooma.
Father.N.M.Sg.Erg own3Sg.Poss.F daughter.N.F.Sg.Dat kissed.V.Sg
The father kissed his own daughter.

8(b) Baap-nay *apna* daughter-ko chooma.
Father-N-M-Sg.Erg own3Sg.Poss.M daughter.N.F.Sg.Dat kissed.V.Sg

The above-mentioned sentence can be translated as *The father kissed his own daughter*. The Matrix language is Urdu while the possessed noun comes from English. In this case, it is expected for the user of Pakistani English to prefer the first sentence (8a) i.e. Baap-nay *apni* daughter ko chooma. The possessive *apni* is in the feminine form in this sentence and agrees

with the object noun *daughter,* in accordance with Urdu grammar possessive rules which is also the Matrix language.

2. English as Matrix Language with Urdu as EL

It gets interesting when one tries to make a prediction where English is the ML and Urdu, the EL. This is illustrated by a comparison between (9a) and (9b).

9(a) The father kissed his own beti.
The father.N.M.Sg kissed.V his.3Sg.Poss.M own daughter.N.F.Sg.
The father kissed his own daughter.
9(b) The father kissed her own beti.
The father.N.M.Sg kissed.V her.3Sg.Poss.F own daughter.N.F.Sg.
The father kissed her own daughter.

Given the principles of the Matrix Language Frame (MLF), it would be expected that participants would follow the same rules when Urdu is the matrix language. Specifically, in English, the possessive pronoun typically relates to the possessor (often the subject) rather than agreeing with the object of the sentence. However, I predict that some participants might find this confusing and lean towards selecting the sentence "The father kissed her own beti," which is incorrect according to English language rules. A native Urdu speaker might instinctively apply Urdu rules, where the possessive pronoun agrees with the object noun. Therefore, participants might tend to choose sentence 9(b), where the possessive agrees with the object noun, rather than the subject, as required in English.

1b. For the second part of RQ1 which is about the Reaction Times it can be predicted that when the possessive agreement aligns with the Matrix Language (ML), reaction times will likely be faster than when the agreement aligns with the Embedded Language (EL) of the code-switched possessum. This prediction reflects the idea that participants will process agreement more quickly when it matches the structural rules of the ML, with slower reaction times when faced with potential conflicts due to the embedded, code-switched possessum in the EL.

2. As predicted previously, when Urdu is the matrix language in a sentence, possessive agreements typically follow Urdu grammatical rules i.e. the possessive pronoun agreeing with the object noun. Conversely, when English serves as the matrix language, possessive agreements adhere to the grammatical rules of English i.e. an agreement between the possessive pronoun and the subject of the sentence. To predict the preference of the above-mentioned

possessive agreement irrespective of the matrix language and proficiency is a tricky one though. In my opinion the results might show that the preferred agreement might vary w.r.t the proficiency of the users. Let us take the following considerations in view, a user with a higher proficiency in both Urdu and English may exhibit more seamless switching of the possessive forms e.g. between *his own* and *apni* depending on which language structure dominates the conversation as explained in the examples used in the previous prediction. However, users with lower proficiency in one of their languages may rely more on the possessive forms that match the possessive agreement pattern of the language they are more comfortable with. For instance, if a speaker is more proficient in English, they might apply English possessive agreement rules—even when Urdu is the matrix language (ML). This could result in using possessive pronouns that agree with the subject of the sentence, as in English, rather than with the object, as in Urdu. The claim that proficiency can have an impact on code switching is supported by previous research demonstrating the importance of proficiency in code-switching. For instance, Poplack (1980) found that bilinguals with high proficiency in both languages were more adept at maintaining the grammatical rules of each language while switching, including the accurate use of possessive forms based on the matrix language. Similarly, Myers-Scotton's (1993) Matrix Language Frame (MLF) model highlights that during code-switching, the grammatical structure of the matrix language determines the form of the embedded language. It also suggests that proficient bilinguals are better at adhering to the grammatical norms of the matrix language, including possessive pronouns.

The current research also looks at other extra linguistic factors that can possibly have an effect on the preferences of participants when they make a choice for the preferred possessive agreement, these factors include code switching habits i.e. how frequently the participants think they code switch in a conversation and a general attitude of participants towards code switching, meaning do they consider it to be something that is natural and cannot be avoided, or is it something that should not be done at all. It can be predict that participants who frequently code-switch between Urdu and English, and those with a positive attitude towards code-switching, will more easily follow the Matrix Language (ML) in a given situation. Specifically, they are more likely to apply possessive pronoun–subject agreement when the ML is English and possessive pronoun–object agreement when the ML is Urdu. Myers Scotton (2006) examined in her study how the matrix language affects the overall structure of code-switched sentences. She examined how frequent or habitual code-switchers navigate these structures and maintain grammatical consistency despite switching.

3. The third research question deals with the animacy of the object noun and the question of whether the preference for agreement relationship is affected if the possessee is human or inanimate. It may be that possessive agreement patterns change based on the Matrix language in the sentence and the nature of the noun being possessed, especially when considering animacy. Let's break down the predicted patterns for animate and inanimate nouns based on some examples.

1. Urdu as Matrix language and English as EL

Let us consider the following set of examples 10(a) and (b) for animate object nouns:

10(a) Admi-nay apna daughter-ko chooma.
Man.N.M.Sg.Erg own3Sg.Poss.M daughter.N.F.Sg.Dat kissed.V.Sg
The man kissed his own daughter.

10(b) Admi-nay apni daughter-ko chooma.
Man.N.M.Sg.Erg own3Sg.Poss.F daughter.N.F.Sg.Dat kissed.V.Sg
The man kissed her own daughter.

In this case a prediction can be made that participants are less likely to make gender agreement errors with animate object nouns compared to inanimate nouns. Since animate nouns (e.g., *daughter, friend, man*) have clear natural gender (female or male), participants are more likely to correctly apply Urdu's gender agreement system, even in code-switched constructions. So it is more likely that given the sentences 10(a-b), the participants are more likely to choose the sentence 10(b), where the natural gender of the noun *daughter* (feminine) corresponds to its grammatical gender in Urdu, so participants are less likely to make deviations in possessive agreement. Animate nouns with clear natural gender (male or female) tend to trigger the correct possessive form in Urdu (*apni* for feminine, *apna* for masculine).

Now let us make a prediction for inanimate object nouns by considering the following set of examples 11 (a) and (b):

11(a) Admi-nay apni car-ko dhoya.
Man.N.M.Sg.Erg own3Sg.Poss.F car.N.F washed.V.Sg
The man washed her own car.

11(b) Admi-nay apna car-ko dhoya.
Man.N.M.Sg.Erg own3Sg.Poss.M car.N.F washed.V.Sg
The man washed his own car.

Gender assignment to inanimate objects in Urdu is arbitrary and learned through exposure, which could lead to less stability in gender agreement with such nouns, particularly in code-switching contexts where English lacks such gender distinctions. Learners might show more deviations in agreement with inanimate nouns, while remaining more consistent with animate nouns. Hence it can be predicted that there will be higher variability in possessive agreement when the possessed noun is inanimate, compared to when it is animate. Participants may more uncertain when applying gender agreement rules to inanimate nouns, leading to fluctuating use of *apna* and *apni* pronouns.

Now let us move on to possessive agreement patterns when:

2. English is the matrix language and Urdu EL

In sentences with English as the matrix language with animate object noun a prediction can be made that the possessive pronouns his/her will follow English possessive agreement, and Urdu's gender rules will not interfere. So, the subject will agree with the possessive pronoun. For example, consider example (12).

12(a) The man kissed his own beti.
(b) The man kissed her own beti.

Between the two sentences mentioned above, the participants will follow the agreement in 12(a). The presence of Urdu word *beti* (daughter) should not affect the possessive pronoun agreement i.e. the possessive pronoun will agree with the subject so the animacy of object noun in this situation will not matter. However, the possibility that some of the participants might also deviate from following the English possessive pattern and prefer to choose the sentence 12(b) can also not be ignored given the transfer effect that might exist in the context of code switching. So, some participants might choose the sentence 12(a) instead due to the influence of their native language Urdu.

Now let us make a prediction for inanimate object nouns keeping in view the following examples:

13(a) The man washed his own gaari.
(b) The man washed her own gaari (car).

Here it can be predicted again that English, possessive pronouns like his own or her own refer to the possessor's gender and are independent of the gender of the noun being possessed

(whether it's animate or inanimate). In this case, *the man* is the possessor, and since he is masculine, we use "his own". The object noun *gaari* (car) used here is a feminine noun in Urdu, so when a switch is made between English and Urdu, the gender of the Urdu noun does not affect the English possessive pronoun agreement. In other words, the fact that *gaari* is feminine in Urdu does not influence the choice of the possessive pronoun *his own* in English. English possessive pronouns are based on the possessor's gender, not the object's gender.

Now let us look at the last part of this research question i.e. does the presence of human possessee make any difference in the agreement relationship in these two contexts of code switching. As explained in the examples above, the presence of an animate or inanimate possessee significantly influences the consistency and correctness of agreement in both matrix languages (Urdu and English) during code-switching. When the possessee is human, such as *daughter* (beti), it is predicted that the participants are more likely to correctly apply the relevant possessive forms. This is due to the clear gender associated with animate nouns; for instance, in the Urdu examples 10(a-b), *daughter* is a human possessee and is feminine, which leads to a stronger alignment with the corresponding possessive pronoun *apni* when the subject is feminine and conversely *apna* when it is masculine. This clarity allows participants to more reliably follow Urdu's gender agreement system, resulting in a higher chance of selecting the correct possessive form, as shown in 10(a) and 10(b). Conversely, when the possessee is inanimate, as in the examples involving *car* in 11 (a-b), the unclear gender assignment can create ambiguity. This lack of clarity may cause participants to fluctuate between using *apna* and *apni* pronouns, which can reflect less stability in their agreement patterns due to the lack of clear natural gender distinctions hence showing deviations. Hence, it can be said that the presence of a human possessee can make difference when the Matrix Language is Urdu. On the other hand, when we look at English being the Matrix Language possessive pronouns like *his* and *her* (such as in examples 12 and 13 (a-b)) are based solely on the gender of the possessor so they remain unaffected by the fact that whether the possessee is human or non human. So in this case we can say that the presence of human possessee does not make a big difference when it comes to Codeswitching from English to Urdu.

2.5 Chapter Summary

This chapter provides a comprehensive background on possessive constructions and code-switching, focusing on the differences between English and Urdu. The chapter begins by explaining how possessive agreement functions in both languages: in English, possessive

pronouns agree with the possessor in terms of gender and number whereas in Urdu, possessive markers change according to the gender and number of the possessed item (possessum) rather than the possessor. The chapter also introduces the Matrix Language Framework (MLF), which is the theoretical model guiding the study. According to the MLF, in code-switching, the Matrix Language (ML) sets the grammatical structure, including word order and agreement patterns, while the Embedded Language (EL) contributes content. The chapter also reviews literature on possessive agreement in multilingual contexts revealing common deviations which include mismatches in gender agreement made by bilinguals who apply grammatical rules from their first language (L1) to their second language (L2). These deviations often occur when switching between languages like English which does not have a grammatical gender and Urdu which has a clear system of gender agreement. The chapter ends with the research questions and predictions. It is predicted that when Urdu is the Matrix Language the possessive agreement will follow Urdu's grammatical rules. Similarly, when English is the Matrix Language, the possessive pronouns will align with the rules required by English grammar. The same question is addressed from the prespective of Reaction Times as well predicting that when the possessive agreement aligns with the Matrix Language (ML), reaction times will likely be faster than when the agreement aligns with the Embedded Language (EL) of the code-switched possessum. Another prediction is that speakers with higher proficiency in both languages will navigate possessive agreement more easily i.e. they will be able to switch between the two systems with fewer deviations from ML. However, less proficient speakers may rely on the agreement patterns of their stronger language, even when that language is not the Matrix Language in the sentence. Lastly, the study also hypothesized that participants will make fewer deviations from ML when the possessed noun is animate, particularly human, as they have a clear natural gender which makes agreement easier. In contrast, when the possessed noun is inanimate, which has an uncler gender assignment in Urdu. Hence, the participants are expected to show more variability and inconsistency in applying possessive agreement rules. Therefore, it is anticipated that the nature of the possessed noun (animate or inanimate) and the language proficiency of the speaker will play an important role in determining possessive agreement during code-switching.

Chapter 3 Methodology and Data Collection

This chapter will provide an overview of the research methodology and the data collection process. It also deals with the tasks that composed the study. This study has been approved by The Norwegian Centre of Research Data (NSD).

3.1 Methodology

Considering the research questions and the predictions outlined in the previous chapter, it was important to design a methodology that would answers the questions holistically while keeping the research framework in mind. It is also important to explain the choice of participants and the different conditions that were being tested. The target group in this study were people residing in Pakistan with Urdu as their Native language and English as their second language. Therefore, to narrow down the selection of the participants based on this language criterium and other criteria such as age, L1 and L2, a language background questionnaire was conducted followed by a Forced Choice Task. Both will also be explained in this chapter.

3.1.1 Participants

Early childhood education in Pakistan begins from 3 years of age (Ahmad, 2011) i.e. this is the time when children start going to school in Pakistan. At this age both Urdu and English languages are taught to the children at the very basic level followed by regular examinations after 6 years of age at the end of each academic year. Pakistan is a country with at least six major languages and 58 minor ones (Rahman, 2004). According to the constitution of Pakistan Urdu is the national language of the country (Article 251 of the 1973 Constitution of the Islamic Republic of Pakistan). The national language, Urdu, has over 11 million mother-tongue speakers while those who use it as a second language could well be more than 105 million (Grimes, 2000).According to the 1973 constitution of the country, English was supposed to continue as the official language of Pakistan till such time that the national language (s) replaced it but until now no replacements have been made and English is continued to be used as the official language. Given the official status of English language, it is used as the primary language of instruction in the schools along with Urdu. A total of 30 participants took part in this study. A group of university students residing in Pakistan were targeted with age group ranging between 18 to 25 years of age. All participants were native speakers of Urdu

with English as their second language. I contacted a group of university students in the given age group, both male and female, with Urdu as their native language and English as their L2.

3.1.2 Language Background Questionnaire

The questionnaire focused on two types of questions, one regarding the basic demographic information about the participants followed by some questions regarding their language background and their perceptions about code switching. The demographic information asked from the participants included questions about their age, native language, second language, level of education and their country of residence. This part of the questionnaire helped to separate participants based on the main requirements of the study i.e. Age, Native Language Urdu and L2 English. The participants unable to fulfill these requirements were excluded from the study before they could proceed to the actual task.

The second part of the questionnaire gathered information about language proficiency for both Urdu and English, preference of use of these languages in several social settings, preferences of language usage when codeswitching and their general perceptions about using more than one language at a given time. All the questions asked were mainly closed ended. The complete questionnaire is provided in Appendix 1.

3.1.3 Forced Choice Task

This study used Forced Choice Task (FCT) as a method for data collection. While many other methods also exist that have been used in the studies of Code Switching such as Acceptability Judgement tasks or Grammaticality Judgement Tasks, the selection of FCT was however found to be a better fit for this study for several reasons. This selection was made considering that every participant might have a varying definition of acceptability or grammaticality among themselves and with respect to the researchers understanding as well. Another reason for choosing FCT instead of acceptability judgement task was the context of code switching, for which it is more difficult to provide an acceptability judgement task as compared to FCT. In a Forced Choice Task, the participants are shown pairs of stimuli, and they must decide which of the two items is "better" based on a given criterion. This excludes the ambiguity that can be caused by other tasks by making the participants choose one code switched sentence over another one instead of comparing one sentence against an abstract grammatical ideal (Stadthagen-González, Parafita Couto, Párraga, & Damian, 2019). This

method has been used in many studies related to codeswitching such as, Stadthagen-González at a. (2019) investigated theoretical accounts of code-switching by using comparative judgments of adjective-noun order. Participants were presented with pairs of stimuli and asked to choose which of the two was better according to a given criterion. Beatty-Martínez, A. L., Navarro-Torres, C. A., & Dussias, P. E. (2020) investigated the role of language dominance and code-switching patterns using FCT to assess bilingual participants preferences for code-switched versus non-code-switched sentences. Valdés Kroff, J. R., Dussias, P. E., Gerfen, C., Perrotti, L., & Bajo, M. T. (2017) explored the comprehension of code-switching using eye-tracking and a Forced Choice Task to understand how bilinguals process mixed language input.

Test Sentences: For this study a task was designed keeping in mind the conditions that were to be tested namely possessive pronouns, gender and animacy. Firstly, for the test sentences we had a total of 8 conditions: 2 x CS direction (Urdu mixed into English and English-Urdu) by 2 x animacy by 2x gender. The design of the task was structured to see the use of these variables in sentences that featured code-switching in Urdu and English. The task involved sentences that conformed to a set of **eight** experimental conditions. These conditions were derived by combining three key variables: direction of code switching (Urdu mixed into English and English mixed into Urdu), Animacy (Animate and Inanimate) and Gender; Masculine or Feminine in mismatched conditions e.g. Masc subject – Fem object and Fem subject – Masc object etc. This was done to create a grammatical condition where the pronoun agreed with the noun e.g. in Urdu and an ungrammatical condition where it agreed with the subject, as it in English for each test sentence. The **eight** conditions were the result of crossing these three variables. The conditions included Urdu mixed into English / animate / masculine, Urdu mixed into English / animate / feminine, Urdu mixed into English / inanimate / masculine, Urdu mixed into English / inanimate / feminine, English mixed into Urdu / animate / masculine, English mixed into Urdu / animate / feminine, English mixed into Urdu / inanimate / masculine and lastly, English mixed into Urdu / inanimate / feminine. 4 sentences were made for each condition followed by 2 versions per sentences as per the FCT; version one of each trial had the possessive pronoun agree in gender with the subject and a version two where it agreed with the object of the sentence. Simple sentences were made using trasitive verbs like kiss, see, love, buy, throw, etc. For the subject's simple NP like "the man", "the woman", "the boy", "the girl" etc were used while for objects (both animate and inanimate) common objects were used e.g. animate objects: his/her son, daughter, mother, father, etc. Inanimate objects could be his/her

ball, house, car, etc. The task design for the test sentences looked like the following as shown in Table 1 and 2:

Urdu mixed into English – 16 test sentences		
Animate objects	Masculine subj – feminine object (4 sentences)	Version 1: MASC possessive
		Version 2: FEM possessive
	Feminine subj – masculine object (4 sentences)	Version 1: FEM possessive
		Version 2: MASC possessive
Inanimate objects	Masculine subj – feminine object (4 sentences)	Version 1: MASC possessive
		Version 2: FEM possessive
	Feminine subj – masculine object (4 sentences)	Version 1: FEM possessive
		Version 2: MASC possessive

Table 1: FCT design for test items Urdu-English

English mixed into Urdu – 16 test sentences		
Animate objects	Masculine subj – feminine object (4 sentences)	Version 1: MASC possessive
		Version 2: FEM possessive
	Feminine subj – masculine object (4 sentences)	Version 1: FEM possessive
		Version 2: MASC possessive
Inanimate objects	Masculine subj – feminine object (4 sentences)	Version 1: MASC possessive
		Version 2: FEM possessive
	Feminine subj – masculine object (4 sentences)	Version 1: FEM possessive
		Version 2: MASC possessive

Table 2: FCT design for test items English-Urdu

All sentences used in the trials have been attached in Appendix 2, but to show a few examples, the following type of sentences were made for Urdu-English and English-Urdu Codeswitching for the possessive pronoun condition:

- Urdu-English CS

1. *Admi-nay apna daughter-ko chooma* VS *Admi-nay apni daughter-ko chooma.*
   The man his daughter kissed — The man her daughter kissed.
   'The man kissed his daughter.' — 'The man kissed her daughter.'

- English-Urdu CS

2. *The man kissed her own beti*. VS *The man kissed his own beti.*
   daughter — daughter

The sentences primarily had the object noun codeswitched in the embedded language (English in example 1 and Urdu in example 2). Furthermore, the sentences showed variations in animacy and gender, as explained in the tables above and Appendix 2.

For the filler items, other differences between the two languages were investigated and two types of filler items were decided upon. We know that the positioning of heads in phrases differs across languages. In head-initial languages the head precedes its complements, and in head-final languages the head follows its complements (Cook & Newson, 1996). In English all heads (whether nouns, verbs, prepositions, or adjectives etc.) normally precede their complements (Radford, 2006) whereas in Urdu the complement preceds the head. This difference holds true for verbs and adpositions in both the languages. To compare the two, English has a Subject-Verb-Object structure while Urdu follows a Subject-Object-Verb order. The difference in the positioning of verb among the two languages was used to make the first set of filler items.

A total of 8 verb placement filler items were made for each Urdu-English and English - Urdu codeswitching context. The design for the filler sentences looked like as shown in Table 3 and 4:

English mixed into Urdu – 8 filler sentences		
Animate objects	L1 (2 sentences)	Version 1: SOV
	L2 (2 sentences)	Version 2 : SVO

Inanimate objects	L1 (2 sentences)	Version 1: SOV Version 2 : SVO
	L2 (2 sentences)	

Table 3: Filler sentences design for FCT, English – Urdu CS

Urdu mixed into English – 8 filler sentences		
Animate objects	L1 (2 sentences)	Version 1: SOV Version 2 : SVO
	L2 (2 sentences)	
Inanimate objects	L1 (2 sentences)	Version 1: SOV Version 2 : SVO
	L2 (2 sentences)	

Table 4: Filler sentences design for FCT, Urdu – English CS

Each item further had two versions for the participants to choose from, one version of each trial followed the SVO order while the other one followed SOV order. So, for example in the English-Urdu CS, animate condition the following type of sentence trials were made:

Version 1*: The girl* ***daikha*** *the boy in the room at midnight*.

The girl *saw* the boy in the room at midnight.

VS

Version 2: *The girl the boy in the room at midnight* ***daikha***.

The girl the boy in the room at midnight saw.

In the above-mentioned sentence, trial version 1 of the sentence followed the SVO word order while version 2 of the sentence followed the SOV word order. The order in which the versions appeared in front of the participants was randomized in the task to ensures that no single version was consistently chosen from appearing in a particular order. This was also done to ensure that the results were not skewed by order effects, improving the validity of the data collected. Similarly for Urdu-English CS, the following type of sentence trials were made following the same word order principles:

Version 1*: Larki-nay **saw** larkay-ko kamray-may aadhi raat-ko.*

The girl saw the boy room midnight

'The girl saw the boy in the room at midnight.'

VS

Version 2: *Larki-nay larkay-ko kamray-may aadhi raat-ko **saw**.*

The girl the boy room midnight saw

The girl the boy in the room at midnight saw

'The girl saw the boy in the room at midnight.'

This gave us a total of 16 filler items (both Urdu-English and English-Urdu conditions combined) in the verb placement category.

The second set of filler items were made using prepositions in English and postpositions in Urdu. The design for this set of fillers was straightforward, as explained below:

- Urdu-English CS (total 8 filler sentences all inanimate)
- English-Urdu CS (total 8 filler sentences all inanimate)

For each trial, one version of the sentence had a post position while the other version had a preposition codeswitched within the sentence. The following type of sentences were made for each trial and the participants had to choose between the two versions of each trial sentence:

- Urdu-English CS

Version 1: *Billi **under** kursi-kay hai.* VS Version 2: *Billi kursi-kay **under** hai.*

The cat under the chair — The cat the chair under

The cat is under the chair. — The cat is under the chair.

- English-Urdu CS

Version 1: *The cat is **neechay** the chair.* VS Version 2: *The cat is the chair **neechay**.*

The cat is under the chair — The cat is the chair under

This gave us a total of 16 filler items for the pre/postpositions category (attached in Appendix 2).

Overall, 64 sentences were used in the task, the division of which has been shown in the table below:

	Test Sentences: **32**	Fillers:**32**
Urdu-English	a. Animate objects: **16** MASC subj - FEM obj (8 sentences) FEM subj – MASC obj (8 sentences) b. Inanimate objects: MASC subj - FEM obj (8 sentences) FEM subj – MASC obj (8 sentences)	a. Verb Placement Fillers: **8** Animate x 2 items for L1 Animate x 2 items for L2 Inanimate x 2 items for L1 Inanimate x 2 items for L2 b. Pre/Postposition fillers:**8**
English-Urdu	a. Animate objects: **16** MASC subj - FEM obj (8 sentences) FEM subj – MASC obj (8 sentences) b. Inanimate objects: MASC subj - FEM obj (8 sentences) FEM subj – MASC obj (8 sentences)	a. Verb Placement Fillers: **8** Animate x 2 items for L1 Animate x 2 items for L2 Inanimate x 2 items for L1 Inanimate x 2 items for L2 b. Pre/Postposition fillers: **8**

Table 3: Total number of test and filler items for FCT

3.1.4 Procedure

All parts of the experiment were built and hosted by Gorilla Experiment Builder (www.gorilla.sc), which is a web-based platform that makes recruiting participants from different parts of the world relatively easy (Anwyl-Irvine et al., 2019). Conducting an online experiment on a platform such as gorilla was the easiest way to collect data efficiently and with convenience given the fact that all the participants were from Pakistan. The experiment took approximately 35-40 mins to complete.

The participants were provided with a link which they could follow to conduct the online task. The task started with an information sheet where the purpose of this study was shared with the participants followed by the two tasks which they were required to complete, the language Background Questionnaire and the Forced Choice Task. Keeping all the ethical considerations in mind, a consent form was also shared with the participants which was embedded within the task as a part of it. The participants could proceed after giving their consent to participate in an

online language task and a questionnaire, and after agreeing for the anonymised data to be stored and used after the end of the project for future research. After giving their consent, the participants could proceed to the language background questionnaire which consisted of 22 questions and took a total of 10-15 minutes for completion. Exclusion parameters were set and embedded within the task and participants unable to fulfil the requirements, which included the participants age (between 18-25 years), L1 Urdu and L2 English were excluded after the questionnaire ended.

The next part after filling the questionnaire was the Forced Choice Task. Instructions were given (both in English and Urdu) about the task after which the participants were made to do 5 practice trials to illustrate how the task worked, and to ensure that they all understood the instructions. It is important to mention here that the task was also designed in a way that it measured the reaction time between the trials. With the display of each trial, a time stamp was recorded in gorilla, and a second timestamp was recorded when the participant made a choice, and the difference between the two gave us the reaction time. The participants had to make their choice for each trial before they could move on to the next trial. All the trial sentences (test and filler sentences both) in the task were randomized. The participants were allowed to take three breaks which were offered after regular intervals to break the monotony and to make the participants focus on the sentences in a better way. It was up to the participants to decide how long each break should last; a continue button was added to the display which could be used once the participants wanted to continue with the experiment. If completed in one go without any breaks, the task took a total of 20-30 minutes on average to complete.

3.2 Chapter Summary

This chapter first presented the sample size of the experiment. A group of 30 participants were carefully selected keeping in mind the research questions and the conditions that were being testes. The experiment design was outlined in the next section explaining the language background questionnaire and the Forced Choice Task. A brief account on Forced Choice Task being the right choice for this study was also elaborated by the researcher. Lastly, the division of test and filler sentences based on the conditions being tested along with some example sentences were described followed by the procedure with which the experiment was finally conducted.

Chapter 4 Results

Chapter 4 presents the results of the tasks utilized in this study, namely the language background questionnaire and the Forced Choice Task (FCT). The data was retrieved from Gorilla and analyzed using various tools in Microsoft Excel, including pivot tables, filters, charts, and graphs. In the following sections, I will discuss the FCT results in relation to the test sentences on possessive agreement and code-switching across the different conditions outlined in the previous chapter. Additionally, I will explore the data collected from the language background questionnaire, focusing on how extra-linguistic variables influence participants possessive agreement patterns. Lastly, the findings regarding agreement patterns following the object noun in relation to animacy will be examined.

4.1 Results for The Forced Choice Task

4.1.1 Agreement of Possessive Pronouns while CS

As described in the previous chapter, the design of the task was structured to see the use of possessive pronouns in sentences that featured code-switching in Urdu and English. The task involved sentences that conformed to a set of eight experimental conditions. Let us firstly look at the results for possessive structures with Masculine Subject, Feminine Object with Animate Object noun and Masculine Subject, Feminine Object with Inanimate Object noun (shown on the right side of the graph) for both English and Urdu as ML. The sentences had the object noun codeswitched in the embedded language, so when English was the ML, the object noun came from Urdu and vice versa. The graph shown below displays the gender of the pronoun chosen by the participants for both when Urdu was the Matrix language and for when English was the matrix language.

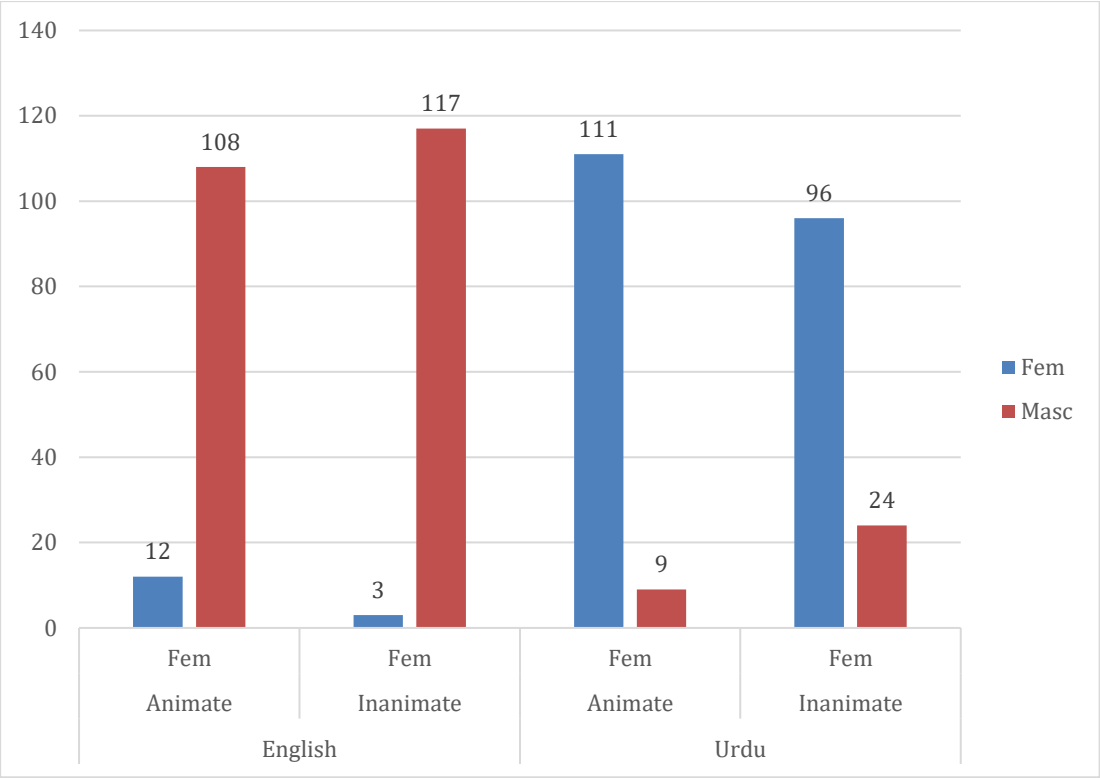

Figure1. Masculine Subj, Fem Obj, Animates/Inanimate – ML English & Urdu

Figure 1 shows us a bar graph comparing the distribution of animate and inanimate object nouns across two languages, English and Urdu, classified by gender object (feminine). The bars in the graph show that when English is the ML, and the subject noun was masculine and object noun was feminine, the participants choose masculine possessive 108 times, outnumbering feminine animate ones which were only chosen 12 times. On the other hand, when Urdu was the ML, participants used possessive pronouns for masculine animate nouns 9 times, whereas they used possessive pronouns for feminine animate nouns 111 times. However, for inanimate nouns when English was the ML, masculine inanimate possessives were preferred by the participants 117 times outnumbering feminine inanimate which were chosen 3 time only. Now let us look at the results when the Matrix Language was Urdu. With Urdu as the ML, feminine inanimate possessives (chosen 96 times) outnumber masculine inanimate ones which were chosen 24 times. Overall, the participant responses show a heavy skew toward masculine nouns for both animate and inanimate objects when English is the ML and the subject is masculine. The participant responses for when Urdu is the ML on the other hand has more feminine nouns, especially for inanimate objects, which might suggest a stronger gender distinction in Urdu for objects compared to English. The results show us that when English is the ML, the preferred possessive pronoun is masculine because possessives agree with the

subject in English, and when Urdu is the ML, feminine pronoun is preferred because in Urdu possessives agree with the possessum, that is, the object.

The other gender combinations for the possessive agreement that were a part of the test design included sentences with Feminine Subject, Masculine Object with Animate and inanimate Objects for both English and Urdu as Matrix Languages. These sentences had the object noun codeswitched in the EL, so when English was the ML, the object noun came from Urdu and vice versa. The graph shown below displays the preferences of the participants for both when Urdu was the Matrix language and for when English was the Matrix Language.

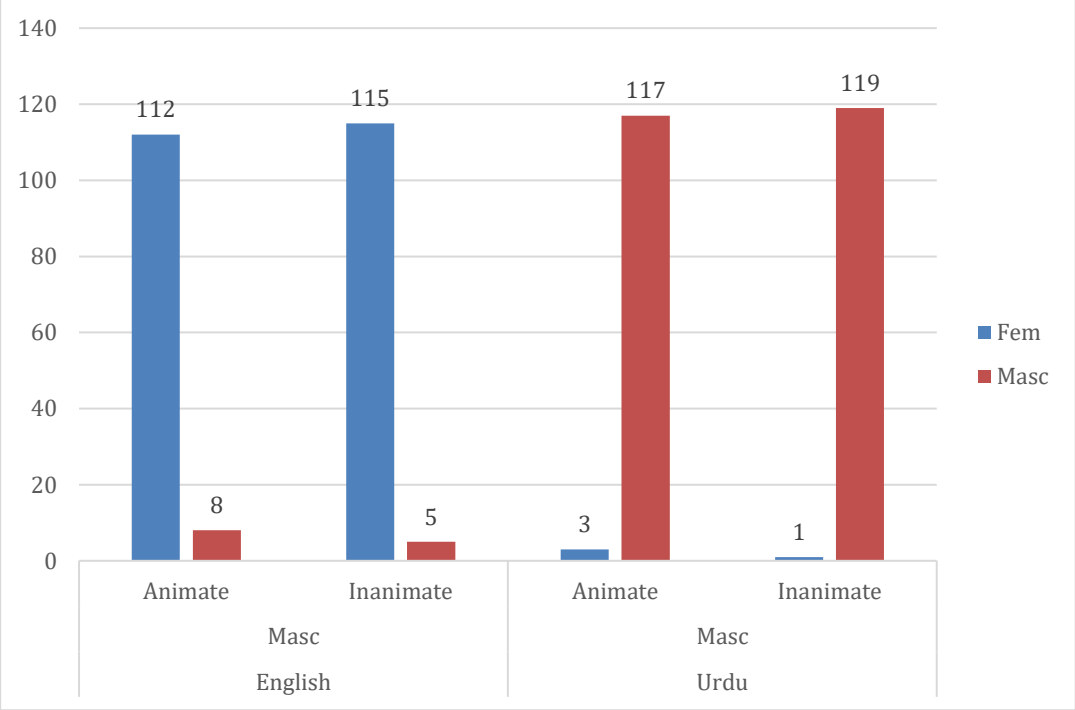

Figure 2. Feminine Subj, Masc Obj, Animates/Inanimate – ML English & Urdu

Figure 2 shows a bar graph which compares the distribution of animate and inanimate object nouns across English and Urdu, by gender. The graph is focused on Feminine subjects and Masculine objects. The bars show participant responses for their preferences on possessives. According to the graph when English is the matrix language (ML), feminine gender responses dominate in both animate and inanimate masculine categories, with 117 and 112 responses respectively. The graph also shows that when English is the ML, agreement with the subject is preferred. In contrast, when Urdu is the ML, masculine responses dominate in both animate and inanimate masculine categories, with 119 and 115 responses respectively. The preferred agreement pattern comes from the ML here as well. There are some minimal

instances of preference for the other gender (i.e., masculine responses in English, feminine responses in Urdu).

Overall, these results align with the MLF model by showing that the Matrix Language governs possessive pronoun agreement patterns. When English is the ML, possessive pronouns agree with the subject and when Urdu is the ML, possessive pronouns agree with the object. This reflects the different agreement systems of both the languages and how they influence code-switching.

4.1.2 Reaction Times

As mentioned in the previous chapter, the FCT also recorded the Reaction Times of the participants i.e. how long each participant too to respond to each sentence trial. First, let us look at the reaction times of the two Matrix Languages.

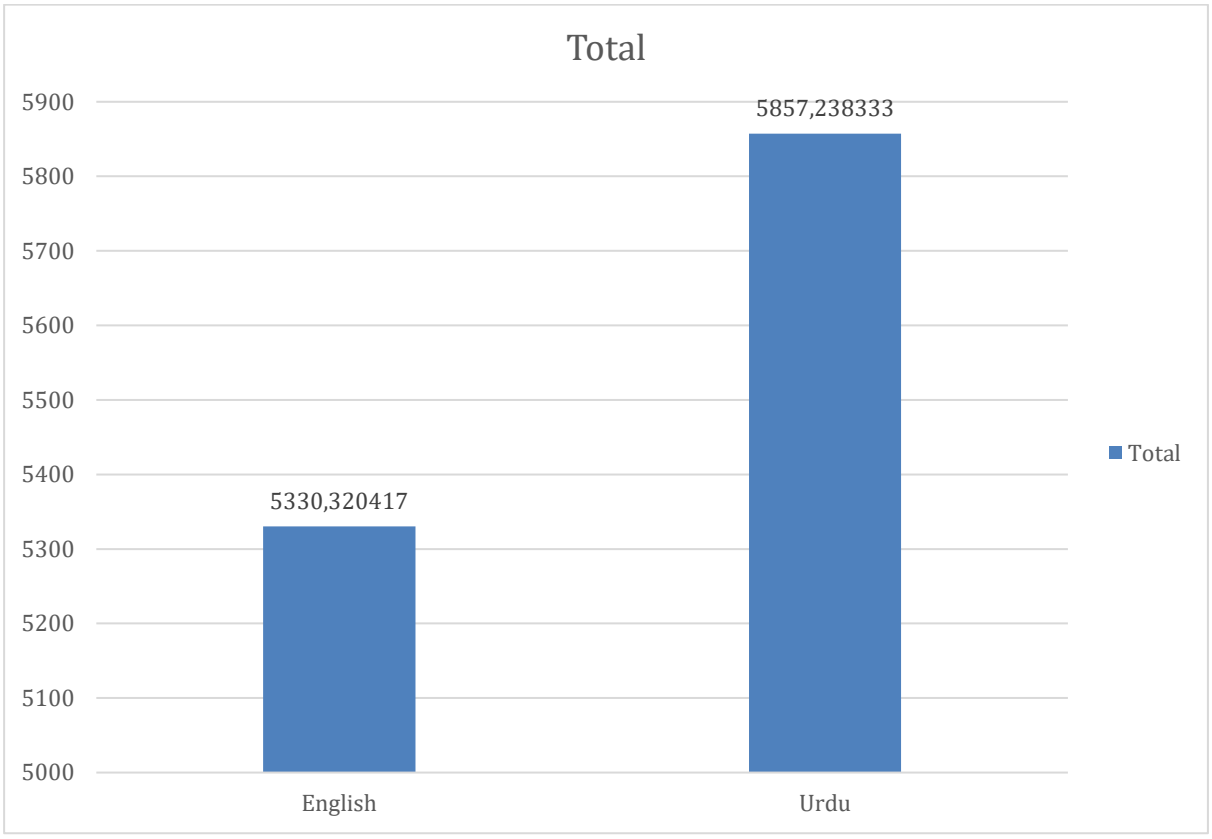

Figure 3. Reaction Times – ML English and Urdu

The graph shown in figure 3. compares the average reaction times between two matrix languages: English and Urdu. Urdu matrix language leads to a higher average reaction time compared to English suggesting that participants took longer to respond when the matrix

language was Urdu. The results also imply that the processing time is faster when English is the ML as compared to when Urdu was the ML.

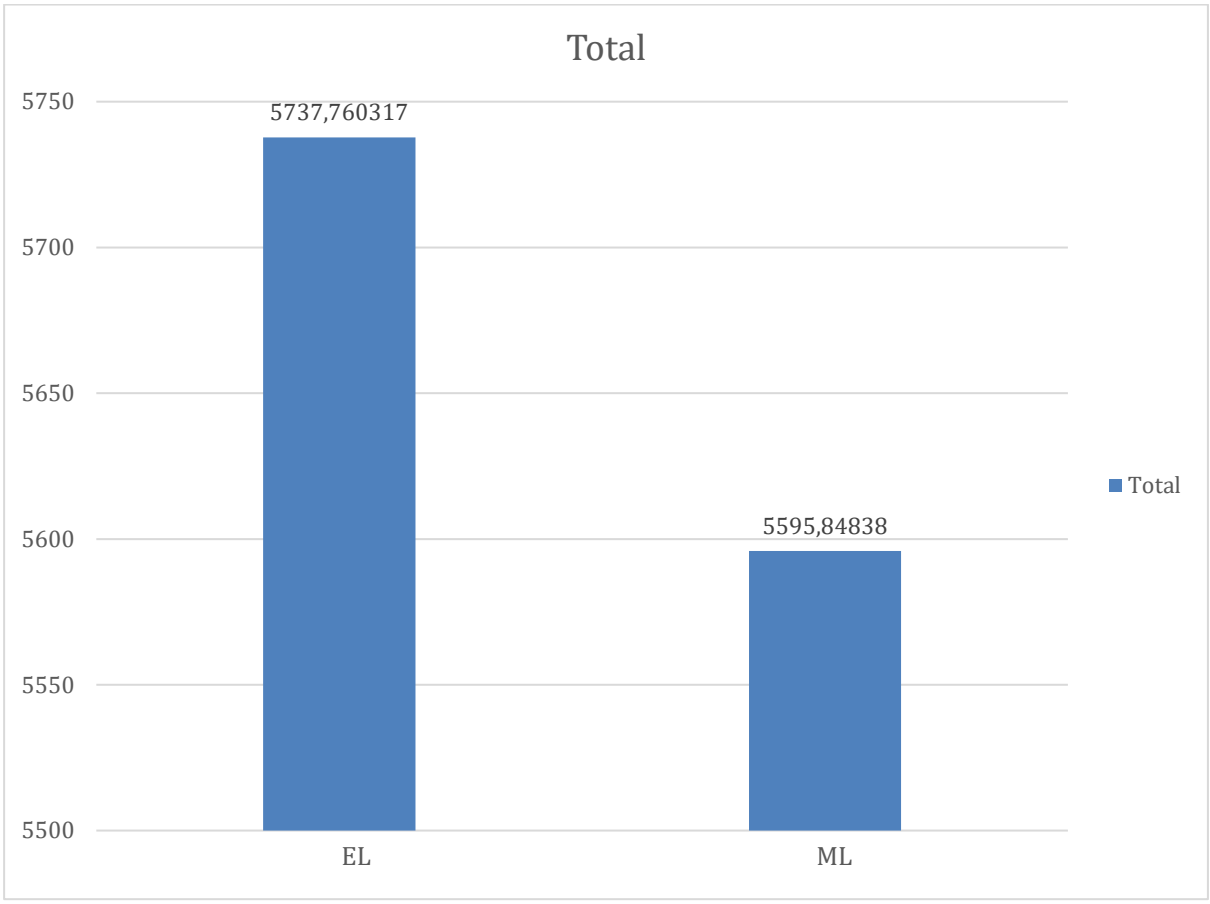

Figure 4. Difference between Reaction Times (ML vs EL)

Figure 4 shows the comparison of reaction times (RTs) between the Matrix Language and the Embedded Language. Reaction times for ML shows the average time the participants took when they chose the agreement pattern of the ML whereas the reaction times for EL shows the average RT of the participants when they chose the agreement pattern of the embedded or the code-switched language. On average, participants responded faster when they chose the agreement pattern of the ML than when they choose the agreement pattern of the EL. This suggests that participants may be more efficient or quicker in responding when they are following the agreement rules of the ML as compared to when they follow the rules of the EL i.e. using the agreement pattern of EL slow down the reactions.

4.1.3 Possessive Pronoun Agreement and Animacy

In English Language, animacy does not have a direct effect on possessive pronoun agreement since they are based on the gender (for third-person singular) and number of the possessor instead of animacy of the noun. For example, the possessive pronoun *his* is used for masculine nouns and *her* for feminine nouns. On the other hand, animacy does play a more noticable role in Urdu, particularly in gender agreement. In Urdu, animate nouns, both masculine and feminine, require gender agreement. For example, a possessive pronoun must agree with the gender of the object. However, with inanimate objects, Urdu language sometimes shows flexibility in gender assignment with certain inanimate nouns having a default gender that speakers may apply less consistently, despite them still formally carrying a gender. This contrast between the two languages becomes more visible in code-switching contexts, where English-Urdu bilinguals may show a stronger adherence to gendered agreement rules with animate nouns but may exhibit divergence with inanimate ones. The next research question of this study deals with animacy and possessive pronoun agreement, i.e. the role of animacy in determining what the possessive pronoun agrees with.

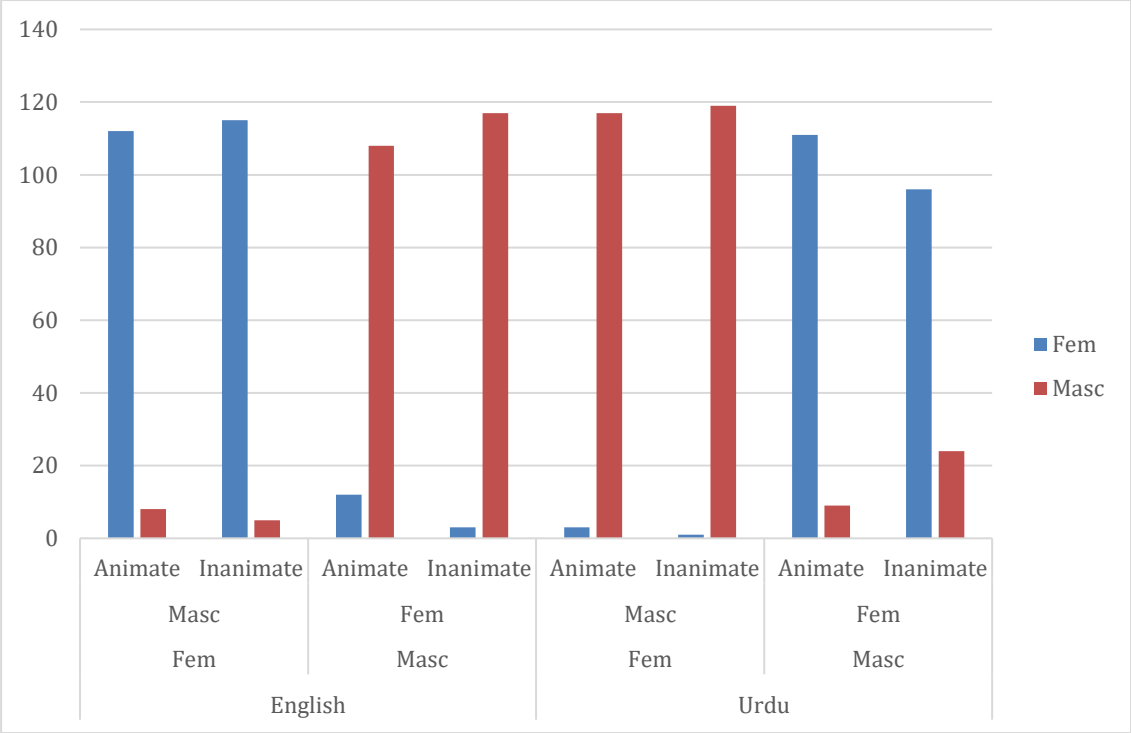

Figure 5. Possessive Agreement w.r.t Animacy of Object Nouns.

Figure 5 visually presents the conditions on which the test sentences were based, specifically looking at the animacy of the object nouns. On the Y-axis, we have the frequency

or count of responses, ranging from 0 to 140, while on the X-axis, we have Matrix Language, Gender Subject, Gender Object, and Animacy Object.

Looking at the responses for English as the matrix language (ML), we see that for animate masculine objects, feminine responses are more (over 100) as compared to the masculine responses which are very few. For inanimate masculine objects, the same pattern is seen, with dominant feminine responses. For animate feminine objects, masculine responses dominate (over 100), while feminine responses are minimal. Similarly, inanimate feminine objects show a dominant masculine response. The participants' responses when English is the ML show a preference for feminine possessives for masculine objects and masculine possessives for feminine objects, diverging from expected gender agreement.

When Urdu is the matrix language, participants show more predictable patterns in gender agreement especially for animate objects which suggests a stronger adherence to gender norms in Urdu compared to English. However, for inanimate feminine objects in Urdu, there is more divergence from the expected pattern in comparison to animate objects. In contrast, in English, divergence appears to be more frequent when the object is animate rather than inanimate. This divergence pattern reveals that animacy does plays a role: in ML English, participants are more likely to diverge when the object is animate, likely using the Urdu-like (local) agreement in these cases. Conversely, in ML Urdu, while participants generally follow Urdu's gender norms, they are more likely to diverge when the object is inanimate. This suggests that animate objects are more likely to receive the Urdu-like agreement pattern (= local agreement) across both matrix languages, while inanimate objects tend to trigger more divergence, especially when Urdu is the ML.

The results are over all aligned with the MLF which suggests that the Matrix Language has a significant impact on gender agreement preferences. While animacy influences agreement in both English and Urdu contexts, animate objects trigger local agreement more often than inanimate ones for both MLs.

4.1.4 Possessive Agreement Patterns and Extra Linguistics Variables

In addition to examining possessive pronoun agreement patterns in sentences involving code-switching between Urdu and English, this research also explored the relationship between these agreement patterns and extralinguistic factors such as participants proficiency, their code-switching habits, and their preferences towards code-switching. Data on the extralinguistic

variables were collected through a language background questionnaire, which was structured to focus on two main areas: participants basic demographic information and their language background, including their code-switching habits and preferences. Combined with the data from the Forced Choice Task (FCT), various patterns were examined linking possessive agreement in Urdu-English code-switching with the relevant extralinguistic factors.

As shown above, there were very few examples where the preferred agreement pattern did not follow the ML. To determine whether this was because most participants occasionally permitted agreement with the switched language or because a few participants did it often it was necessary to look at individual preferences. Firstly, the agreement patterns for the possessive pronouns were looked at for both the languages i.e. English and Urdu separately to find out the variation in the responses. Responses differing from the main pattern i.e. possessives agreeing with the gender of the subject in English and the gender of the object in Urdu were identified for every participant and the following results were obtained:

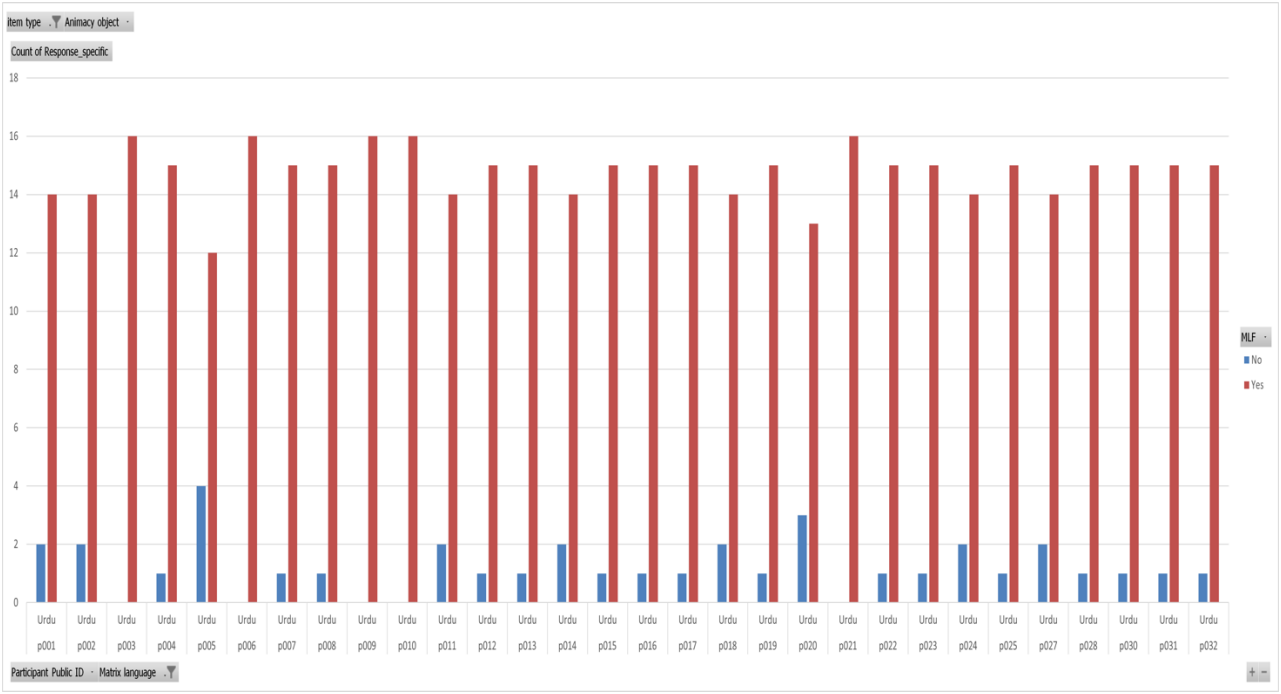

Figure 6. Possessive agreement patterns per participant – ML Urdu

Figure 6. displays a graph showing participants with Matrix language Urdu. The blue in the graph represents the non-ML responses where the participants did not follow the agreement pattern for Urdu and selected the possessive pronoun that agreed with the gender of the subject instead of the gender of the object. Similarly, Figure 5 shows another graph displaying the variation for every participant for when the ML was English. The blue in this

graph represents the non-ML responses where the participants did not follow the agreement pattern of English and selected the possessive that agreed with the gender of the object instead of the gender of the subject.

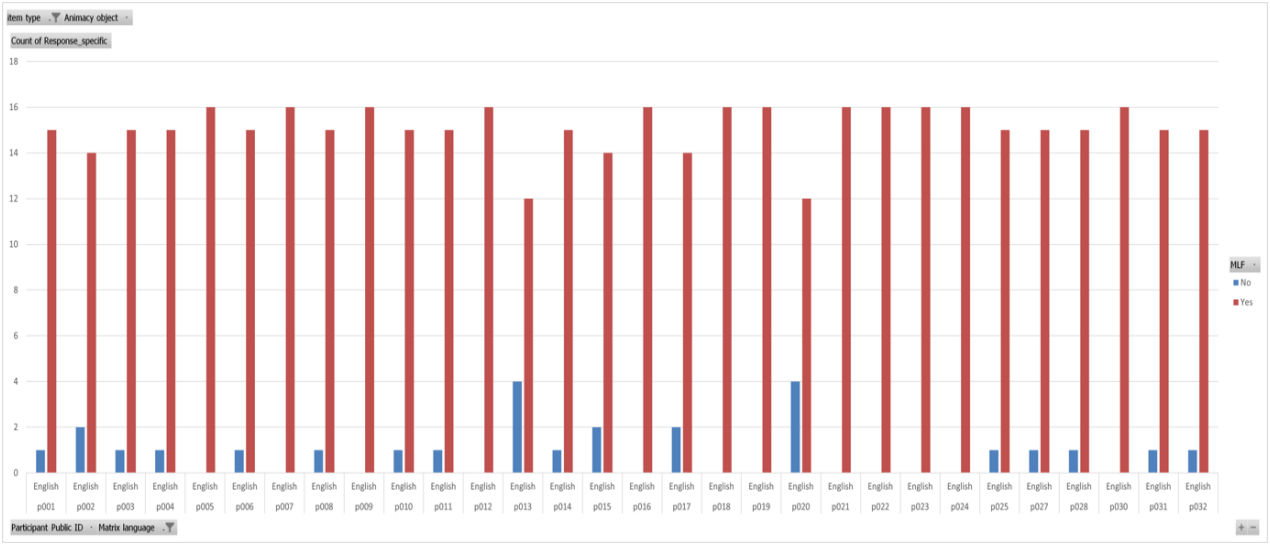

Figure 7. Possessive agreement patterns per participant – ML English

Looking at these results, the participants were divided into three groups i.e. the participants who showed more variation than the other, the ones who showed less variation and lastly, the ones who showed no variation at all. The groups were made based on the variationin their responses regarding matrix language frame (MLF) usage. Participants who showed a mix of responses with both "Yes" and "No" responses for MLF and had the blue bars more prominent were added in the “more variation” group. Participants who showed a small amount of variation, but most responses were "Yes" for MLF, and the red bars dominated with minimal blue bars were added in the “less variation” group. These participants showed some variability but not as much as the first group. Lastly, participants who showed no variation, and had all the responses as "Yes" for MLF with only red bars and no blue bars at all were added in the “no variation” group. These participants consistently used the matrix language without deviation. For ML Urdu, 2 participants showed more variation, 23 participants showed less variation while 5 of them showed no variation at all. On the other hand, for ML English, 2 participants showed more variation, 16 showed less variation, while 12 participants showed no variation at all from the given pattern. After separating participants based on the variations that were shown in the graph, further investigation was made to find out if there were any extra linguistic variables that could be related with the variation groups.

The extra linguistic variables that were studied in reference to the variations observed included proficiency of participants in Urdu and English, preferences of the participants in CS i.e. do they prefer mixing Urdu into English or English into Urdu and lastly, their general inclination towards CS i.e. do they always CS, do they prefer doing it frequently, sometimes, or is it a rare occurrence for them to CS.

a. Proficiency vs Degree of Divergence

To find out the preference of participants for the agreement pattern and its relationship with extralinguistic factors discussed earlier, a scatter plot was made to show trends or correlations between the two variables i.e. participant proficiency and the number of deviations from the pattern per ML. The scatter plot allowed us to see how the number of deviations changes as proficiency increases and vice versa along with other patterns such as a higher proficiency leading to fewer deviations.

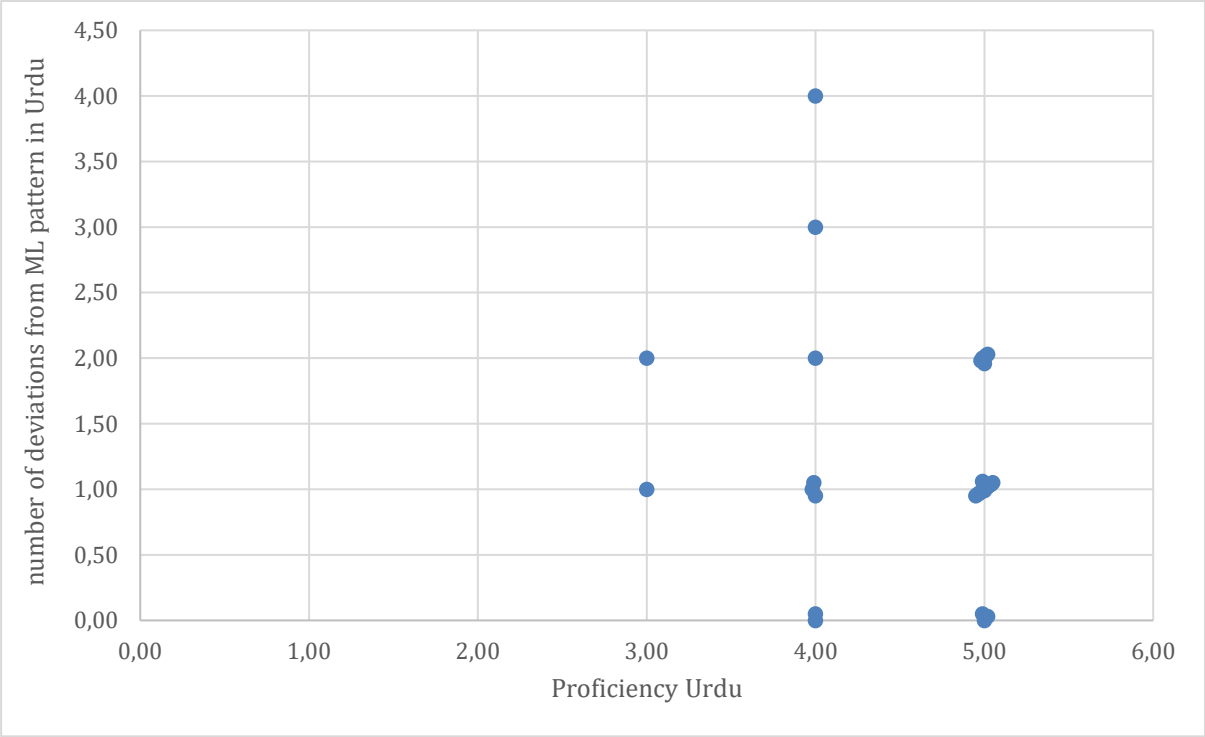

Figure 8. Number of Deviations from ML Pattern & Participant Proficiency – ML Urdu

The x-axis shows participant proficiencies in Urdu which range from 0 to 6 where higher values indicate greater proficiency in Urdu. The y-axis shows the number of deviations from the expected ML pattern in Urdu which range from 0 to 4. A higher value on the y-axis means the participants deviated more from the expected language pattern. From the graph in figure 6

we observe different patterns. There are relatively fewer participants with very low proficiency (below 3.0), and they show a low number of deviations, typically ranging from 0 to about 2 deviations. For participants with proficiency 4 there is a wider spread in the number of deviations. Some participants deviate more frequently i.e. up to 4 deviations, while others deviate very little almost close to 0 deviations. This suggests a high variation in how participants with medium proficiency handle the ML pattern. Participants with higher proficiency i.e. closer to 5 tend to cluster around lower numbers of deviations which are mostly between 0 and 2 deviations. The scatter plot shows that as proficiency in Urdu increases the number of deviations from the ML pattern generally decreases. However, there are notable variations at medium proficiency levels (around 4.0), where some participants still exhibit a high number of deviations, while others show minimal deviations.

A similar relationship to the one shown in figure 9 was studied but for ML English and the following results were seen:

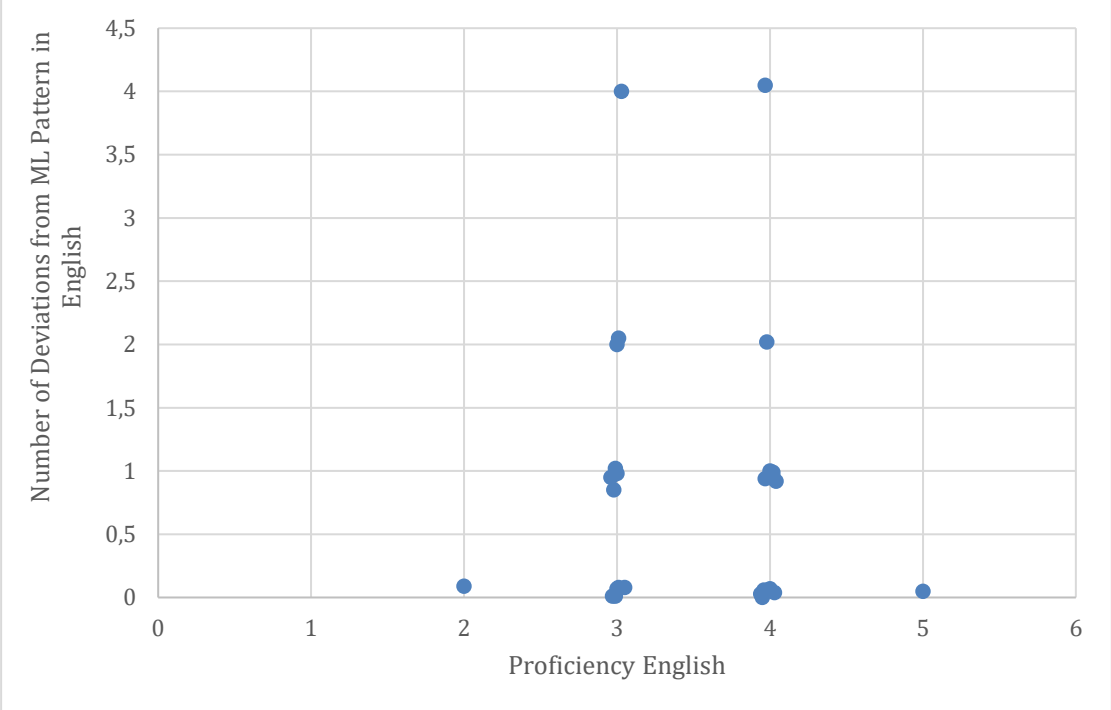

Figure 9. *Number of Deviations from ML Pattern and Participant Proficiency – English*

This scatter plot visualized the relationship between English proficiency which is on the x-axis and the number of deviations from the Matrix Language pattern in English on the y-axis. The scatterplot shows that participants with lower proficiency in English i.e. below 2.5 generally show fewer deviations i.e. mostly around 0-2. There is less data in this range,

suggesting fewer participants in this proficiency category. For participants with medium proficiency which is around 3 and 4, the number of deviations vary more widely. Some participants deviate quite a bit i.e. up to 4 deviations, while others deviate very less. This indicates a broader range of performance for participants with moderate English proficiency, like what was seen in the Urdu proficiency plot. Participants with higher English proficiency closer to 5 tend to cluster around lower deviations which are mostly between 0 and 1 deviations. This means that participants with greater proficiency in English are more accurate in maintaining the ML pattern, with fewer deviations from the expected syntactic structures. The scatter plot also showsthat higher proficiency in English results in fewer deviations from the ML pattern, but participants that fall in the mid-range of proficiency show the most variation in their adherence to the pattern.

To see if there were any effects of proficiency of languages on the agreement opposite to the ones explained above a comparison was drawn between proficiency of Urdu language with deviations from ML pattern in English and between proficiency of English Language with deviations from ML pattern in Urdu. The following results were obtained:

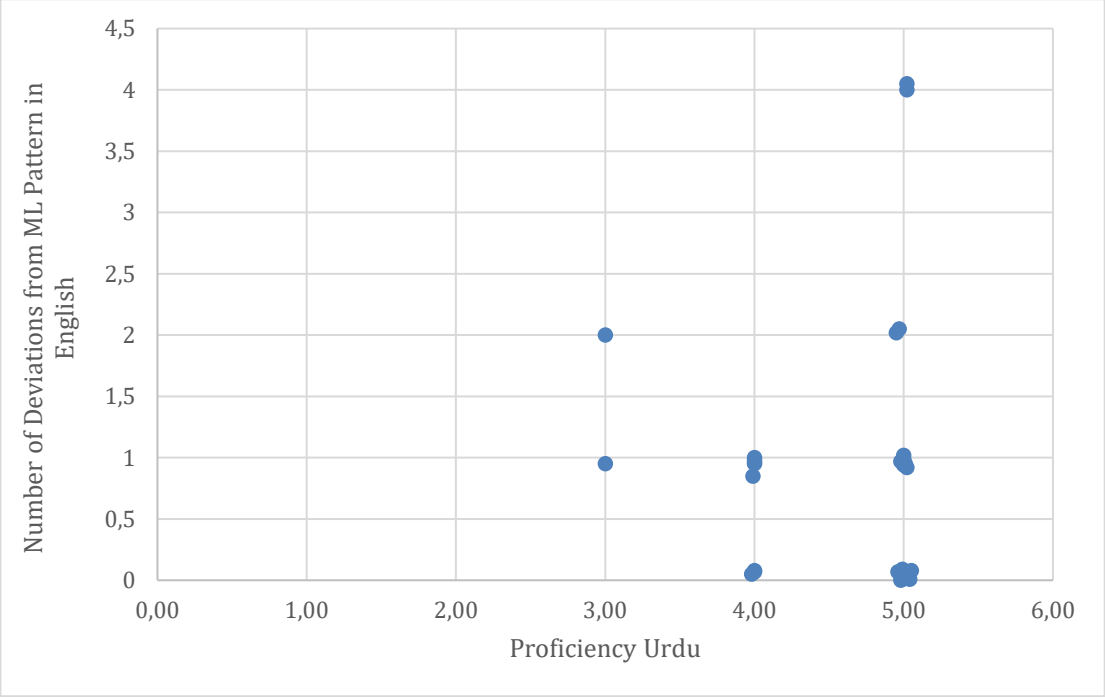

Figure 10. Number of deviations from ML Pattern in English and Proficiency in Urdu

Figure 10 shows Proficiency in Urdu, measured on a scale from 0 to 6 on the x axis and number of deviations from ML pattern in English, ranging from 0 to 4.5 on y axis. The points

are scattered, indicating no clear linear relationship between Urdu proficiency and the number of deviations from the ML pattern in English. Many data points are clustered around the 5.0 proficiency level in Urdu, with a range of deviations from 0 to 4 in English. There are fewer data points for Urdu proficiency below 3, but the deviations from the ML pattern in English are generally low, between 1 and 2. For Urdu the number of deviations from the ML pattern ranges from 0 to 4 with a higher number of deviations observed for proficiency levels around 4 and 5. The lack of a clear trend shows that deviations in ML pattern in English are not strictly dependent on Urdu proficiency but some influence might existt especially for higher proficiency levels.

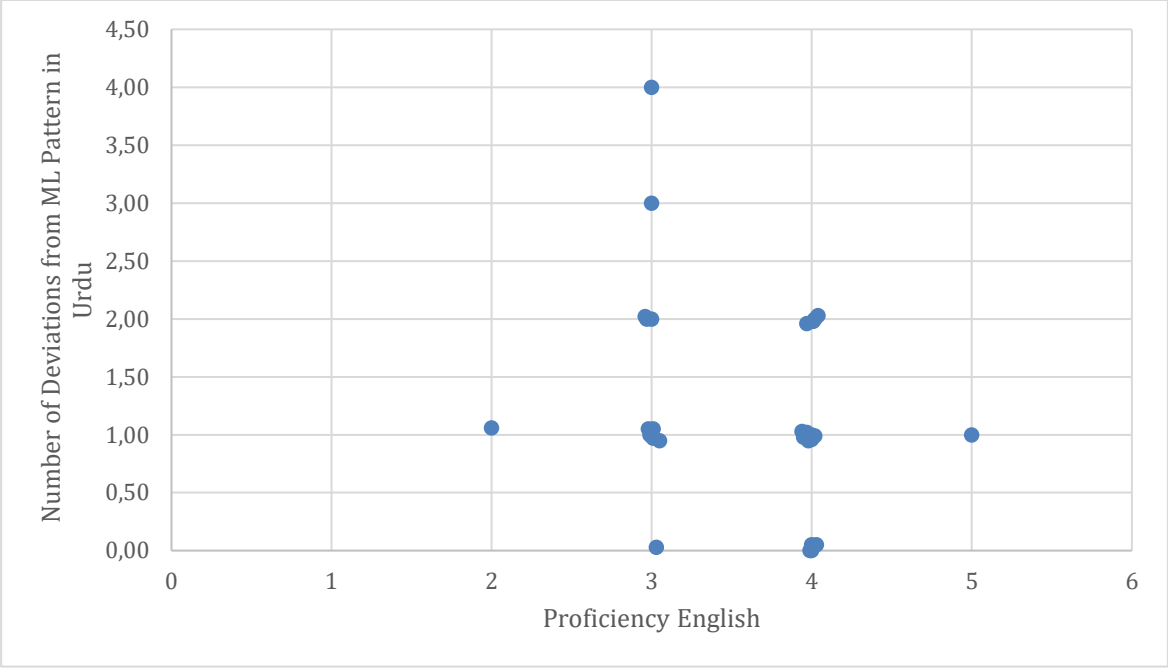

Figure 11. Number of deviations from ML Pattern in Urdu and Proficiency in English

The graph in figure 11 shows Proficiency in English, measured on a scale from 0 to 6 on x axis and Number of deviations from ML pattern in Urdu, ranging from 0 to 4.5. There are several points clustered around proficiency levels 3 and 4 in English, with a range of deviations from 0 to 4 in Urdu. There are fewer data points for English proficiency levels of 1, 2, and 5. The deviations from the ML pattern in Urdu range from 0 to 4.5, with most deviations clustered between 1.0 and 3.5 for people with English proficiency between 3 and 4. A few individuals with English proficiency levels of 4 or higher show deviations of around 4 in Urdu. A possible relationship that we see here is between the English proficiency levels below 3, where participants show fewer deviations in Urdu (around 1 or less). Another relationship can exist

between higher deviations from the ML pattern in Urdu with English proficiency around 3 or 4. Although this relationship is not entirely linear or direct but if we look at all the data points, the graph suggests that moderate proficiency in English (around 3-4) may lead to more deviations from expected Urdu pattern. On the other hand lower or higher proficiency in English might lead to fewer deviations which is what was expected.

b. Frequency of Language Mixing vs Degree of Deviation

Another prediction made in this study regarding the extra linguistic variables and agreement preference stated that participants who frequently code-switch between Urdu and English, and those with a positive attitude towards code-switching, will more easily follow the Matrix Language (ML) in each situation. Specifically, they are more likely to apply possessive pronoun–subject agreement when the ML is English and possessive pronoun–object agreement when the ML is Urdu. To see if this prediction was true, the relationship between frequency of language mixing and the number of deviations from the accepted pattern per ML was looked at and the following results were obtained:

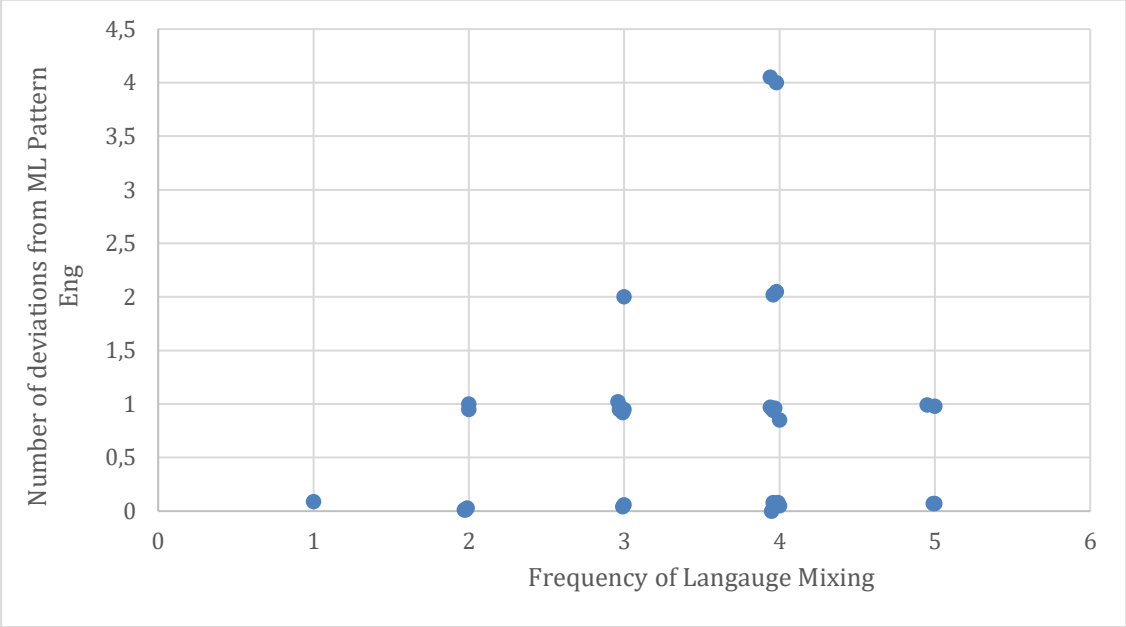

Figure 12. Frequency of Language Mixing and Deviations from ML Pattern in English

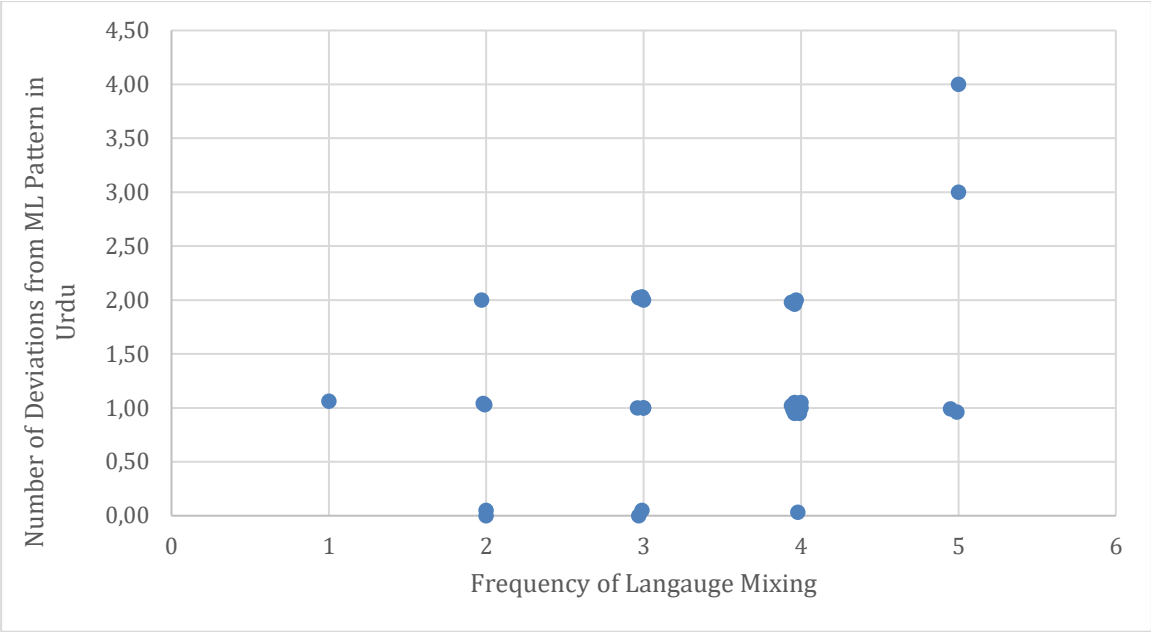

Figure 13. Frequency of Language Mixing and Deviations from ML Pattern in Urdu

The two graphs shown in Figure 12 and 13 present data comparing the number of deviations from the Matrix Language (ML) pattern in Urdu and English, plotted against the frequency of language mixing among participants. Figure 11 shows the frequency of Language Mixing on x axis and the number of deviations from ML pattern in Urdu on y axis. The scatter plot shows that as the frequency of language mixing increases, there are varied deviations from the Urdu matrix language pattern. Like forexample at lower frequencies of language mixing (e.g., 1), there is a lower number of deviations (around 1). As the frequency increases (e.g. as it goes up to 3 or 4), the deviations vary with some points having up to 4 deviations. This suggests higher variability in maintaining the Urdu ML pattern among participants who mix languages more often.

Figure 10 shows the frequency of Language Mixing on x axis and the number of deviations from ML pattern in English on y axis. The graph presents the number of deviations from the English matrix language pattern as language mixing frequency increases. At low language mixing frequencies (e.g., 1), there are fewer deviations (sometimes close to 0). As frequency increases (e.g., around 4), the number of deviations tends to increase but not consistently, with some participants showing up to 4 deviations and others fewer than 1.

If we compare the two graphs, we see that deviations from ML Urdu pattern seem to have more consistent spread and higher peaks of deviations as language mixing frequency increases.

On the other hand, English deviations also increase but with more variability across participants. In both graphs, increased frequency of language mixing correlates with a broader range of deviations from the ML patterns, with slightly more pronounced deviations in Urdu. This may suggest that the more participants mix languages, the harder it becomes to consistently adhere to either language's ML structure.

Chapter 5 Discussion and Conclusion

This study, as mentioned previously in Chapter 2, focused mainly on three research questions:

1(a). Which possessive agreement form is preferred among the users when the possessum/possessee is code-switched? Does the preferred agreement come from the Matrix language or from the code-switched possessum is in the embedded language? When English is the ML, does the presence of an Urdu possessum leads to a preference for the Urdu agreement pattern?

1(b) How does alignment with the Matrix Language (ML) versus the Embedded Language (EL) affect reaction times and error rates in possessive agreement among bilingual Urdu-English speakers?

2.Is the preference for the agreement pattern determined by extra-linguistic variables such as proficiency and Code-Switching habits?

3.What role does animacy play regarding what the possessive pronoun agrees with? Does having a human possessee make any difference in the agreement relationship? It is expected that the presence of a human possessee would not significantly impact agreement in English as the Matrix Language (ML) but would lead to fewer deviations in Urdu for animate human possessees compared to inanimate ones.

These questions will be answered in this chapter based on the results and findings presented in chapter 4 and the predictions drawn from the Matrix Language Framework and described in chapter 2.

5.1 Research Question 1

Based on the Matrix Language Framework it was predicted that the participants would prefer the agreement structure among the test sentences that comes from the Matrix Language. In case when Urdu is the Matrix Language and the possessed noun from English (Embedded Language), it was predicted that the users of Pakistani English will be more inclined towards following the rules of Urdu grammar i.e. agreement between the possessive and the object noun. On the other hand, it was predicted that when English was the Matrix Language and Urdu was

the Embedded Language, participants might find it confusing and lean towards following the incorrect agreement pattern as per the MLF, making the possessive pronoun agree with the object noun instead of the subject.

The data for ML Urdu (111 examples of feminine agreement with animate nouns vs. 9 for masculine) confirmed the prediction, as indicated by the findings obtained from the Forced Choice Task (detailed in chap 4). The possessive pronoun matched the object noun's feminine gender, demonstrating that the participants were adhering to Urdu grammar rules. Participants also indicated a preference for Urdu grammatical rules for masculine animate nouns (117 masculine vs. 3 feminine). Aligning with what was ppredicted, the majority chose masculine possessive pronouns. The results usually supported the hypothesis for inanimate nouns, however when the object was feminine and the subject was masculine, the masculine possessive pronoun was still favored more frequently than expected (24 times). This aligns with the idea of a masculine default in gender agreement which seems to be stronger here in inanimate nouns, possibly because inanimate nouns tend to be less salient in terms of their gender marking. Hence, the masculine default may kick in more easily when speakers aren't paying as much attention to the grammatical gender of the object noun. A similar masculine default effect was also found by Luque et al. (2023) where it was observed that the masculine gender appeared to serve as an unmarked or default gender in Spanish, meaning it was used more frequently and was less prone to assignment errors, especially when the noun's morphology was not transparently gendered. For example, opaque nouns (lacking clear gender cues) tend to receive masculine assignment more frequently, while deviations with feminine nouns are more common.

For animate feminine objects, the data showed a higher frequency of correct feminine possessive pronouns (e.g., 111 feminine pronouns for animate objects in Urdu), which showed that the gender of animate nouns is more cognitively salient and may be more easily retrieved in agreement contexts.

The prediction posited for when English is the matrix language stated that the participants might get confused due to the competing grammatical rules of English and Urdu leading them to incorrectly follow the ML pattern, causing agreement deviations from the ML by matching the possessive pronoun with the object noun rather than the possessor noun. The participants did show some preferences in the unexpected direction e.g. 2 deviations in the feminine animate condition, 8 deviations in the masculine animate condition, 3 in the feminine inanimate and 5

in the masculine inanimate condition, but the correct agreement pattern was overall preferred by the participants as compared to the incorrect ones. So, the prediction held true in a sense that some deviations were observed as participants made opposite choices than what was expected. The results from the Forced Choice Task largely supported the prediction that was made. When Urdu was the Matrix Language, participants followed Urdu grammatical rules, especially with animate nouns, while a masculine default emerged for inanimate nouns. This suggests that gender agreement for animate nouns is more cognitively salient, whereas inanimate nouns may trigger default masculine agreement. When English was the Matrix Language, participants showed some deviations in possessive agreement as predicted, which reflected the influence of Urdu's structure. However, the overall number of correct responses suggests that participants mostly showed adherence to English possessive rules, highlighting the complexity of bilingual possessive agreement. The results, as discussed above were in line with the MLF by Myers Scotton (1993).

The findings from the FCT supported the prediction and the participants overall followed the Matrix Language (ML) agreement patterns when the possessive structure was expressed in the ML. The results in Chapter 4 indicate very little variation in participant choices, which indicates a clear preference for ML-determined agreement and little willingness of the participants to deviate from these grammatical rules. This dominance that we see in the results indicates that the ML sets the agreement form, especially when the possessive form is in the ML, confirming the Matrix Language Framework. Given the methodology that was used when designing the task, where the possessum was presented in the Embedded Language (EL) and the possessor in the ML—it is not surprising that participants defaulted to the ML rules for possessive agreement. Due to this strong adherence to ML agreement forms and lack of variation, statistical analysis could not be applied, and the discussion that will follow will analyze these tendencies where found, instead of statistically confirmed effects.

5.1.1 Reaction Times

As mentioned in Chap 2, this study also recorded the Reaction Times of the participants i.e. how long each participant took to respond to each sentence trial. For the reaction times it was predicted that when the possessive agreement will align with the Matrix Language (ML), reaction times will likely be faster than when the agreement will align with the Embedded Language (EL) of the code-switched possessum. This prediction reflected the idea that participants processed agreement more quickly when it matched the rules of the ML, with

slower reaction times when faced with potential conflicts due to the embedded, code-switched possessum in the EL. The results aligned with the prediction showing that the participants responded faster when they choose the agreement pattern of the ML than when they choose the agreement pattern of the EL (figure 4). There can be different explanations for the difference in RTs one being the familiarity to the ML rules and the complexity of codeswitching to the EL and also the general preference of the participants for the ML option. When the participants were following the agreement rules of the ML, they stayed within one consistent system of grammar. This allowed them to process information more quickly and efficiently without having to switch between the rules of two different languages. Hence, familiarity with the ML's grammar reduced the need for additional effort, leading to faster reaction times. On the other hand, participants responded slower when they had to choose the agreement pattern of the Embedded Language (EL), because when the participants had to shift from one set of grammatical rules (ML) to another (EL), this switch required them to inhibit one set of grammatical rules i.e. of ML while looking for the correct grammatical rules of the EL, which slowed them down hence leading to slower reaction times. Even though the data from this study shows that the participants are proficient in both languages, switching to the EL requires adjusting to a different set of grammatical rules (e.g., gender agreement in this case). This adjustment may cause a slight delay in response which we see in the RTs.

The reaction times for Urdu and English as the MLs were also studied and the results (in figure 3) indicated that participants responded more slowly when dealing with Urdu as compared to English as a Matrix Language which means that the RTs were longer when English was mixed into Urdu than when Urdu was mixed into English. The mean reaction time for ML Urdu (5857 ms) is higher than that for ML English (5330 ms). These results are inline with Han, Li, and Filippi (2022) who found that Chinese English bilingual participants showed longer reaction times in their First Language during mixed language tasks supporting the idea that bilinguals must suppress their dominant language more to help switching into the less dominant Second Language. These reaction times can be related to the results we observed for the possessive agreement patterns in figure 1 and 2. The participants were slower in Urdu than in English, suggesting they were processing more carefully or maybe struggling more with agreement patterns. With slower reaction times one expects less deviations but despite the slower reaction times, the over all deviation rate is higher when Urdu is the ML. Another explanation for slower reaction times could be the use of Latin alphabets for Urdu for the FCT along and the opposite direction of reading (for Urdu Language the script is written from right

to left but for the FCT in gorilla Latin script was used for Urdu sentences which is from left to right). These findings were opposite than the expectation that slower reaction times would lead to fewer deviations from ML, suggesting that the participants may have been overthinking or experiencing more difficulty in applying the gender agreement rules in Urdu, particularly with inanimate nouns where a masculine default interferes.

Urdu has a more complex system of grammatical gender as compared to English. This complexity might explain both the higher error rate and the slower reaction times. Participants might be more careful because they are aware of this complexity but they still deviate from the ML due to the difficulty they face of choosing the correct gender agreement, especially in code-switching contexts. On the other hand, participants responded more quickly in English. This could be an indicatication of participants dependance on default or simplified strategies in English as in English the same gender complexity does not exist which we see in Urdu. This would have speeded up their reaction time but also lead to more deviations. The results in figure 1 show that when dealing with inanimate nouns, some participants defaulted to masculine in Urdu. This could mean that the masculine gender is more easily accessible in their mental grammar hence leading to deviation. The slower reaction times can be a reflection of participants uncertainty about whether to use the default masculine form or apply the correct feminine agreement. We can also relate the Reaction Times with the participant proficiency and even though participants have higher proficiency in Urdu, the cognitive load might be more when they need to manage code-switching and adhere to the grammatical rules, resulting in more deviations despite slower processing. Another reason as mentioned above can be the use of Latin alphabets for Urdu for the FCT along and the opposite direction of reading. English, by contrast, might allow them to fall back on simpler rules, even if that results in deviations (such as incorrectly choosing masculine pronouns as shown in figure 1).

In conclusion, faster RTs were observed when participants followed the agreement patterns of the ML compared to the Embedded Language (EL), highlighting the difficulty involved in switching between languages. The reaction time (RT) data also revealed that participants responded more slowly and deviated more when Urdu was the Matrix Language (ML), probably due to its gender agreement system. On the other hand, participants were faster with English as the ML but also deviated more from the ML, suggesting they relied on simpler strategies. These findings show the impact of linguistic complexity on bilingual processing.

5.2 Research Question 2

Now let us look at the second research question and the prediction that was made regarding it followed by a discussion on the results. The second research question dealt with the animacy of the object noun and the question about whether the preference for agreement relationship is affected if the possessee is human or inanimate.

It was hypothesized that when Urdu is the ML, the participants will make fewer gender agreement deviations with animate object nouns, following the Urdu agreement pattern. Whereas, for inanimate nouns some variability in agreement was expected. For English as the ML, it was expected that possessive pronouns (his/her) would follow English possessive agreement rules without any input from Urdu, for both the animate and inanimate nouns. Additionally, it was also hypothesized that the presence of a human possessee will not significantly affect agreement when English was the ML. For Urdu on the other hand, it was expected that participants will deviate less from the ML with animate human possessors as compared to inanimate ones.

The results for English as the ML revealed a pattern of gender agreement that was in line with the predictions. For animate masculine objects, participants predominantly chose feminine possessives and agreed with the subject possessor, with over 100 feminine responses compared to only a few masculine responses. Similarly, for inanimate masculine objects, there was a preference for feminine possessive pronouns which may reflect influence from Urdu's object-based agreement system. In contrast, for animate feminine objects, masculine possessives were chosen more, while feminine possessives were less, indicating further divergence from typical English possessive agreement rules.

These findings suggest that when English is the ML the participants are not strictly following the subject-based agreement pattern but rather showing a preference for Urdu-like local agreement in some cases. The animacy of the object seems to play a role in this divergence where the animate objects trigger more variation from the expected English possessive pronoun rules. This could be due to the stronger gender distinctions in Urdu. Participants may have unconsciously applied these rules even when the ML was English which led to the dominance of feminine pronouns for masculine objects and vice versa.

When Urdu was the ML, the results showed more gender agreement patterns that aligned with the MLF for animate objects. Participants followed Urdu's gender agreement system for animate objects, with less variability, as hypothesized. Masculine responses dominated for both

animate and inanimate masculine objects, as was expected, reflecting Urdu's possessum-based agreement system, where possessive pronouns must match the gender of the object. However, as predicted before, more variability for inanimate objects were seen. For feminine objects the participants showed a higher divergence from the expected feminine possessive pronouns by frequently using masculine possessives instead. This pattern suggests a reliance on default masculine pronouns in contexts where the object is inanimate which supports the idea that inanimacy reduces the salience of gender agreement in Urdu. The participants choice of "masculine default" for inanimate objects is consistent with the idea that gender marking for inanimates is less strict in Urdu compared to animate nouns. Thus, while participants generally followed the gender norms for animate nouns, they were more likely to diverge from the ML pattern when the object was inanimate, reflecting Urdu's less rigid approach towards inanimates.

5.2.1 Animacy and Divergence:

The results highlight the role of animacy in gender agreement divergence for both the matrix languages. For ML English the participants were more likely to diverge from the subject-based agreement pattern of English when the object was animate by using Urdu-like local agreement for these nouns. In contrast, for Urdu as the ML, divergence was more common for inanimate nouns, with participants defaulting to masculine pronouns. This suggests that animate objects are more likely to trigger local agreement patterns (i.e., agreement based on the object's gender) across both languages, while inanimate objects tend to cause more variability and divergence, especially when Urdu is the ML. These results align with Olsen and Juffs (2020) study where they found the learners to be more accurate with animate objects compared to inanimate ones. The study says that this is particularly noticeable with direct object pronouns like *lo* and *la* in Spanish. For instance, learners often defaulted to using *s* (the dative form) for human referents which shows the influence of animacy in early stages of acquisition. However, as learners progress the use of object pronouns for both animate and inanimate nouns becames more similar with native-like grammar.

The findings are also in line with the Matrix Language Framework (MLF). In English as the ML, participants show a tendency to apply local (object-based) agreement more often for animate objects hence diverging from the expected subject-based English possessive pronoun rules. In contrast for Urdu as the ML, the opposite pattern is observed i.e. greater reliance on the gender norms for animate objects but more variability for inanimate nouns, where

participants sometimes rely on a masculine default. Overall, the results show the complexity of possessive pronoun agreement in bilingual contexts where animacy serves as an important factor in determining the probability of agreement divergence across matrix languages.

5.2.2 Impact of Human Possessee on Agreement Pattern

The final part of the research question predicted that the presence of a human possessee will not significantly effect agreement in English as the Matrix Language (ML) but it will lead to fewer deviations in Urdu for animate human possessees compared to inanimate ones. The results revealed minimal variation for inanimate possessors in English, but on the other hand more deviations were observed for animate human possessors (particularly with feminine animate possessors). This variation challenges the initial prediction. Ït was expected that ML English will not show a considerable difference for human possessees because in English, possessive pronouns agree with the gender of the possessor regardless of whether the possessee is human or non-human. The results however revealed a higher rate of masculine possessive pronoun (his) being used in place of the expected feminine pronoun (her) when the possessee was animate and feminine.

This result may be because of cross-linguistic influence from Urdu because in Urdu the possessive agreement is based on the gender of the possessee instead of the possessor. Participants might have unconsciously applied Urdu's agreement rules while speaking English, which would have led to deviations in possessive pronouns. The difficulty of navigating between two languages with different gender agreement systems in a code-switched context may have also caused participants to struggle with processing which might have resulted in more gender agreement errors than what was predicted. This aligns with the idea that participants may have been influenced by Urdu’s possessum-based agreement system when they code-switched.

For Urdu as the Matrix Language it was hypothesized that participants would deviates less with animate (human) possessees, as gender agreement is clearly marked in Urdu for animates, especially humans. More deviations were predicted for inanimate possessees on the other hand due to the looser gender marking for inanimates in Urdu. The results largely supported these predictions. Fewer deviations were seen for animate possessors in Urdu, which indicated that participants were able to corectly follow Urdu’s gender agreement rules when the possessee was animate.

However, when the possessee was inanimate we saw higher deviation especially with an overuse of masculine possessive pronouns for feminine inanimate nouns. This tendency of the participants to default to masculine forms most probably originates from the fact that in animate nouns, speakers can rely on both grammatical and natural gender, whereas for inanimate nouns, they only have grammatical gender to rely on. This could have led the participants to depend on the masculine default strategy when they were unsure of the correct agreement. The results show that Urdu's straightforward gender marking system for animates and especially for human nouns ensures greater accuracy in possessive pronoun agreement. Whereas for inanimate objects, which are marked less strictly caused more variability in possessive agreement patterns.

In conclusion, the prediction largely held true for Urdu as the ML, where fewer deviations were observed for animate (human) possessees compared to inanimate ones. This supports the idea that participants are more fimiliar with gender agreement rules when the possessee is animate in Urdu. The results for English as the ML however showed more variability than what was expected for animate possessors with cross-linguistic interference from Urdu contributing to the gender agreement errors. The complexity of the gender agreement system in English, combined with the influence of Urdu, led to divergence from the expected patterns, especially for animate human possessors.

5.3 Research Question 3

The last research question was regarding the possessive agreement and various other factors, such as the proficiency of the participants, attitude to code-switching, frequency of code-switching, as reported by the speakers themselves. The prediction made for this RQ stated that: The preferred agreement might vary w.r.t the proficiency of the users. To do so a relationship between proficiency in Urdu and Urdu code-switching into English and vice versa were looked at along with how other factors relate to the degree to which they prefer the non-ML agreement option.

5.3.1 Number of Deviations vs Language Proficiency

As discussed earlier in the context of code-switching, the Matrix Language (ML) is the language that provides the grammatical structure during code-swirched context. For Urdu-English bilinguals, if Urdu is the Matrix Language it is expected that the possessive agreement will follow Urdu grammatical rules, particularly when it comes to gender. Given the results

(figure 8) for this prediction it was observed that for participants with high Urdu proficiency (scores near 5.0), we saw a spread of deviations from the ML agreement pattern. Some participants showed zero deviations, which aligned with the prediction that higher proficiency would result in better adherence to the ML (Urdu) possessive agreement. However, other participants which had the same high proficiency still showed 1-2 deviations which suggests that even proficient Urdu speakers sometimes deviate from the ML pattern. These deviations could be due to code-switching complexity or interference from English possessive structures. Participants with lower proficiency in Urdu, around 3 did not show a higher preference for the English type of agreement as compared to the rest within the same category. In fact, some low-proficiency speakers showed only one deviation or even no deviation at all. This contradicts the prediction that less proficient speakers would struggle more with adhering to the ML pattern. It can also be that the speakers who report a low proficiency in Urdu have another languages as their L1, presumably Punjabi or Pashto (these are the two widely spoken regional languages in Pakistan).

One possible explanation for these findings can be language dominance. Even though some participants are highly proficient in Urdu, their dominance may have shifted to English due to environmental factors such as frequent exposure to English in different contexts such as academic, social and professional. This dominance shift might cause them to choose English possessive forms when doing the task. Frequency of usage can also be another reason for the results we see. Proficient speakers who don't use Urdu as often as English might be rusty with the use of Urdu possessive constructions. The less frequency of usage of Urdu might lead to more deviations, even if their overall proficiency of the participants is high. In certain sociolinguistic environments such as Pakistani community, code-switching between Urdu and English is a common norm. Speakers might be accustomed to mixing English and Urdu to such an extent that deviations from the ML (Urdu) pattern are socially acceptable, leading to more frequent use of English possessive forms. This could explain the deviations among both high and low proficiency speakers. English is considered a high-prestige language, particularly in Pakistan. Even highly proficient Urdu speakers might intentionally switch to English possessive forms due to the prestige attached to English which can result in deviations from Urdu's possessive agreement rules.

For Matrix Language English (figure 9) it was observed that the participants with higher proficiency (around 4 or 5) showed some deviations. These participants did not show as many deviations as those with mid-range proficiency, possibly indicating a better understanding of or

adherence to the ML pattern. Participants with lower proficiency i.e. below 3 show very few deviations from the ML pattern. This can be because the participants with lower English proficiency tend to follow the ML (English) pattern more strictly. The low number of deviations among high-proficiency speakers could be due to their dominance in English which means they are more comfortable preferring English as the Matrix Language even in bilingual settings. Interestingly, the same was observed for low proficiency participants i.e. they made less deviations hence defying the prediction that was made. If we compare the two Matrix Languages, an interesting pattern emerges. In ML English, participants with high proficiency tend to exhibit fewer deviations from English possessive agreement forms, while in ML Urdu, participants with high proficiency showed more deviations in their possessive agreement. This could suggests that participants may feel more comfortable switching between languages when Urdu is the Matrix Language, potentially leading to more deviations, whereas when English is the Matrix Language, possessive patterns tend to be more rigidly maintained. This can also be proved from the data collected through questionnare according to which 27 out of the total 30 participants showed their preference to switch more when the ML was Urdu and only 3 said that they prefer to switch when the ML is English.

Although some participants support the hypothesis that higher proficiency leads to fewer deviations, the overall variability suggests that proficiency alone does not fully account for possessive agreement patterns. Results from both the languages show considerable individual variability in language behaviour, and generally a low preference for the code switched agreement form. Interestingly, some participants deviate in both languages, while others show deviations only in one language. Personal language habits might explain these deviations better than proficiency alone. Other factors such as education, workplace language usage, and individual comfort with each language could influence why some individuals deviate more often, even with similar levels of proficiency. Another explanation for these deviations could be Cross-Linguistic Influence (CLI). Learners who code-switch frequently can develop patterns where they unconsciously adopt possessive forms from one language, when the Matrix Language is the other. The more comfortable a bilingual is with rapid switching, the more likely they may be able to incorporate possessive forms from one language while using another.

Some of the patterns if not all showed deviations in agreement patterns and language proficiency which are in line with Poplack (1980) who said that bilinguals with high proficiency in both languages were more adept at maintaining the grammatical rules of each language while switching, including the accurate use of possessive forms based on the matrix language. While

we see that proficiency plays a role in determining possessive agreement patterns, individual variability and factors such as cross-linguistic influence are also of significance.

5.3.2 Frequency of Language Mixing vs Deviations from ML Pattern

The current research also looks at other extra linguistic factors that can possibly have an effect on the preferences of participants when they make a choice for the preferred possessive agreement, these factors include code switching habits i.e. how frequently the participants think they code switch in a conversation and a general attitude of participants towards code switching, meaning do they consider it to be something that is natural and cannot be avoided, or is it something that should not be done at all. It was predicted that participants have both their languages co-activated to a higher extent when code switching, which means they may have both structures (= both types of agreement) activated at the same time. Hence the English pattern would be more "available", or easily activated, while speaking Urdu as the ML, and vice versa. Specifically, they are more likely to apply possessive pronoun–subject agreement when the ML is English and possessive pronoun–object agreement when the ML is Urdu.

From the result taken from the two scatter plots shown in the previous chapter (figure 12 and 13) the following observations were made:

Figure 12 showed that at lower levels of language mixing, participants tend to show fewer deviations from the ML pattern in English, with some data points close to 0. On the other hand, when the frequency of language mixing increased, the variability also increased showing more deviations ranging from around 0.5 to 4, which contradicts the prediction that higher frequency of mixing would lead to more consistent adherence to the ML pattern i.e. less deviations. The deviations from ML in Urdu were also examined in comparison to the levels of language mixing and the results showed that participants with lower language mixing frequency generally exhibit fewer deviations, though some participants do show deviations around 1 to 2. As the mixing increased, deviations fluctuated more noteably, with deviations from the ML pattern reaching up to 4. This also deviates from the prediction that frequent code-switchers would follow the ML pattern more consistently.

The prediction was that participants who mix languages more frequently would show fewer deviations from the ML pattern because they would be better at adhering to the possessive pronoun agreement rules in each language (subject agreement in English and object agreement in Urdu). However, the scatterplots describe a more complex relationship. Contrary to the

prediction, participants who code-switch frequently seem to show a similar or even greater number of deviations compared to those who mix languages less often. This suggests that an increased exposure to language mixing may not necessarily lead to more consistent followinf of the Matrix Language pattern. Instead, frequent code-switching might introduce more variability in how participants handle possessive pronouns, due to interference between the two languages. The variations across participants are also of importance in explaining the results because they might indicate individual differences. Both graphs show a wide range of deviations at different levels of language mixing, indicating that individual differences might play a larger role than just frequency of mixing. Some frequent code-switchers still show low deviations, while others deviate more, suggesting a possible interaction between frequency of mixing and other factors. The complexity of possessive agreement can also be a reason for the varied results that we see. Possessive constructions in bilinguals during Code-switching are susceptible to deviations from ML because of the differences between the two languages. English and Urdu have distinct rules for possessive agreement (subject agreement in English versus object agreement in Urdu). While the prediction said that frequent mixers would become more consistent at following ML possessive rules, the results suggest otherwise. So, it can be assumed that the complex nature of these agreement patterns makes it difficult for the participants to achieve fewer deviations. Due to the complexity of balancing the two systems the participants despite knowing the rules might fail to consistently apply them.

In conclusion, the data we see in the scatterplots does not align with the initial prediction which was made following the previous study by Myers Scotton (2006) which examined how code-switchers who frequently switch between languages navigate these structures and remain grammatically consistent despite switching. Instead, the relationship seems more variable, with some participants adhering to the ML more consistently than others, regardless of how often they code-switch. This indicates that additional factors beyond frequency of mixing such as attitudes towards code-switching may be at interplay in this situation.

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APPENDICES

Appendix 1: Information Sheet

Welcome to the research project

"Language Mixing among speakers of Pakistani English"

Before we start, we would like to tell you a bit more about our study and we will ask you to give your consent to use your data.

Purpose of the project

Language Mixing among Speakers of Pakistani English is a Master's thesis conducted by Mariam Tariq, student of MA - English Acquisition and Multilingualism at UiT The Arctic University of Norway. Its main aim is to gain a better understanding of how native speakers of Urdu with English as second language mix languages (language mixing is the process of mixing one language with another in a conversation e.g mixing English while speaking Urdu "Mera name Ali hai." or mixing Urdu while speaking English " My naam is Ali.").

Who is responsible for the research project?

Mariam Tariq, student at UiT The Arctic University of Norway is responsible for the project.

Why are you being asked to participate?

You are being asked to participate in this study because you are an adult second language speaker of English living in Pakistan, and your mother tongue is Urdu.

What does participation involve for you?

If you choose to take part in this project, this will involve that you will participate in an online task.

***The online session/task* will consist of:**

- a survey containing questions about your language background (10 minutes)
- a forced choice task (participants will be presented with two sentences at a time and will be asked to choose one sentence that they consider to be most likely used or produced around them) (approx 15 minutes)

Important:

- The experiment can be done from your own home, on a PC or laptop, but not from a smartphone or tablet.
- The session has to be completed in one go.
- **Participation is voluntary**

  If you choose to participate, you can withdraw your consent at any time (even after the experiment is completed) without giving a reason, and with no negative consequences for you. All information about you will then be made anonymous.

- **Your personal privacy – how we will store and use your personal data**

  We will only use your personal data for the purpose(s) specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act). The student and supervisor and co-supervisor will have access to the personal data. Your data will be associated with a code. The list of names and respective codes will be stored separately from the rest of the collected data. The data will be stored on a research server and will be completely anonymised. Participants will not be recognizable in publications resulting from this study.

What will happen to your personal data at the end of the research project?

The experimental data will be completely anonymized and will be stored indefinitely for future research once the current study is completed.

Your rights

As long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and

- send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?

We will process your personal data based on your consent. Based on an agreement with UiT The Arctic University of Norway, NSD – The Norwegian Centre for Research Data AS has assessed that the processing of personal data in this study is in accordance with data protection legislation.

Appendix 2: Consent Form

Are you interested in taking part in the research project

"Possessive Constrctions and Urdu-English Code-switching among speakers of Pakistani English"?

Purpose of the project

Possessive Constructions and Urdu- English Code-Switching among Speakers of Pakistani English is a Master's thesis conducted by Mariam Tariq, student of MA - Multilingualism and Language Acquisition at UiT The Arctic University of Norway. Its main aim is to gain a better understanding of how native speakers of Urdu with L2 English process sentences in code-switched mode.

Who is responsible for the research project?

Mariam Tariq, student at UiT The Arctic University of Norway is responsible for the project.

Why are you being asked to participate?

You are being asked to participate in this study because you are an adult second language speaker of English, and your mother tongue is Urdu.

1 What does participation involve for you?

If you choose to take part in this project, this will involve that you will participate in an online task.

The online session/task will consist of:

1. a survey containing questions about your language background (10 minutes)
2. an acceptibility judgment task (approx 20 minutes)

Important:

- The experiment can be done from your own home, on a PC or laptop, but **not from a smartphone or tablet**.
- The session has to be completed **in one go**.

Participation is voluntary

If you choose to participate, you can withdraw your consent at any time (even after the experiment is completed) without giving a reason, and with no negative consequences for you. All information about you will then be made anonymous.

Your personal privacy – how we will store and use your personal data

We will only use your personal data for the purpose(s) specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act).

The student and supervisor and co-supervisor will have access to the personal data.

Your data will be associated with a code. The list of names and respective codes will be stored separately from the rest of the collected data. The data will be stored on a research server and will be completely anonymised. Participants will not be recognizable in publications resulting from this study.

What will happen to your personal data at the end of the research project?

The experimental data will be completely anonymised and will be stored indefinitely for future research once the current study is completed.

Your rights

So long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
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What gives us the right to process your personal data?

We will process your personal data based on your consent. Based on an agreement with UiT The Arctic University of Norway, NSD – The Norwegian Centre for Research Data AS has assessed that the processing of personal data in this study is in accordance with data protection legislation.

Where can I find out more?

If you have questions about the study or want to exercise your rights, contact:

Mariam Tariq – Masters student at mta044@uit.no
Our Data Protection Officer: Joakim Bakkevold, email: personvernombud@uit.no
NSD – The Norwegian Centre for Research Data AS, by email: (personverntjenester@nsd.no) or by telephone: +47 55 58 21 17.

Yours sincerely,

Mariam Tariq
MA- Multilingualism and Language Acquisition

UiT The Arctic University of Norway

Consent form

I have received and understood information about the project " *Possessive Constructions and Urdu- English Code-Switching among Speakers of Pakistani English* " and have been given the opportunity to ask questions. I give consent:

- to participate in an online language task
- to participate in an online survey
- for my anonymised data to be stored after the end of the project for future research
- for my personal data to be processed until the end date of the study.

Appendix 3: Language Background Questionnaire

In this questionnaire we ask questions about your language background and your perceptions about using more than one language at a given time, as well as some basic demographic information about you.

1. Sex:

2. Age:

3. What is your highest level of formal education?

4. Have you been diagnosed with dyslexia?

(Dyslexia is a learning disorder that involves difficulty reading due to problems identifying speech sounds and learning how they relate to letters and words)

5. Are you currently living in Pakistan?

6. Have you lived in any other country? If yes, then please specify the name of the country and your period of stay over there.

7. Is Urdu your native language (this is the language you were exposed to from birth)?

8. Do you have any other native languages? If yes, then please mention below.

10. Is English your Second Language (Your second language, or L2, is a language that is not your native language, but is acquired later on after acquiring a native language maybe after the age of 3)?

11. Do you have any other second languages? If yes, then please mention below.

12. At what age did you started acquiring English language?

13. How would you rate your proficiency in Urdu language? (1 = beginner, 5 = native speaker)

14. How would you rate your proficiency in English language? (1 = beginner, 5 = native speaker)

15. Which language do you mostly use in the following contexts?

	Urdu	Punjabi	Pushto	English	Other
at home	☐	☐	☐	☐	☐
at work	☐	☐	☐	☐	☐
with friends	☐	☐	☐	☐	☐
with family	☐	☐	☐	☐	☐
at your educational institution	☐	☐	☐	☐	☐

16. Where are you sitting right now as you do this task (at home, at work, at college/ university etc)?

17. Do you sometimes mix languages in a single conversation (i.e. while speaking in Urdu you may use sentences or words from English and vice versa)?

18. Answer this question only if you have selected option "rarely", "sometimes", "frequently" or "always" in the previous question i.e. question #17: When do you mix languages more?

19. Do you mix Urdu into your English more often (e.g My naam is Ali.), or do you mix English into Urdu more often (e.g. Mera name Ali hai.)?

20. Do you ever mix any other language in your conversations other than Urdu or English? If yes, then which language do you use?

21. How do you feel about mixing languages?

Choose one option from the scale given below where option 1 = Language mixing should not be done.
option 2= Language mixing should be used as a last resort only.
option 3 = I have no opinion about language mixing.
option 4 = Language mixing should be done often.
option 5 = Language mixing is natural and cannot be avoided.

22. Is there anything that was not asked in this questionnaire, but you think we should know about?

Appendix 4: Test Sentences FCT – Matrix Language Urdu

Sentence1	**Sentence 2**
Admi-nay apni daughter-ko chooma.	Admi-nay apna daughter-ko chooma.
Betay-nay apna mother-ko daikha.	Betay-nay apni mother-ko daikha.
Larkay-nay apna sister-ko maara.	Larkay-nay apni sister-ko maara.
Nana-nay apni granddaughter-ko pehchana.	Nana-nay apna granddaughter-ko pehchana.
Larki-nay apni brother-ko dhakka-diya.	Larki-nay apnay brother-ko dhakka-diya.
Beti-nay apnay father-ko daikha.	Beti-nay apni father-ko daikha.
Aurat-nay apni husband-ko chorra.	Aurat-nay apnay husband-ko chorra.
Behn-nay apnay brother-ko pakra.	Behn-nay apni brother-ko pakra.
Admi-nay apna ball kho-de.	Admi-nay apni ball kho-de.
Larkay-nay apni chair daikhi.	Larkay-nay apna chair daikhi.
Baap-nay apni table baich-de.	Baap-nay apna table baich-de.
Nana-nay apni book kholi.	Nana-nay apna book kholi.
Aurat-nay apni garden daikha.	Aurat-nay apna garden daikha.
Maa-nay apna apple khaaya.	Maa-nay apni apple khaay.
Larki-nay apna bag phainka.	Larki-nay apni bag phainka.
Daadi-nay apni pen uthaaya.	Daadi-nay apna pen uthaaya.

Appendix 5: Test Sentences FCT

Matrix Language English

Sentence 1	**Sentence 2**
The man kissed his own beti.	The man kissed her own beti.
The son saw her own maa.	The son saw his own maa.
The boy hit his own behn.	The boy hit her own behn.
The grandfather recognized his own nawaasi.	The grandfather recognized her own nawaasi.
The girl pushed her own bhai.	The girl pushed his own bhai.
The daughter saw his own baap.	The daughter saw her own baap.
The woman left her own shohar.	The woman left his own shohar.
The sister held her own bhai.	The sister held his own bhai.
The man lost her own gaind.	The man lost his own gaind.
The boy saw her own kursi.	The boy saw his own kursi.
The father sold his own maiz.	The father sold her own maiz.
The grandfather opened her own kitaab.	The grandfather opened his own kitaab.
The woman saw his own bagh.	The woman saw her own bagh.
The mother ate his own saib.	The mother ate her own saib.
The girl threw her own basta.	The girl threw his own basta.
The grandmother picked his own qalam.	The grandmother picked her own qalam.

Matrix Language Urdu

Sentence 1	**Sentence 2**
Admi-nay apni daughter-ko chooma.	Admi-nay apna daughter-ko chooma.
Betay-nay apna mother-ko daikha.	Betay-nay apni mother-ko daikha.
Larkay-nay apna sister-ko maara.	Larkay-nay apni sister-ko maara.
Nana-nay apni granddaughter-ko pehchana.	Nana-nay apna granddaughter-ko pehchana.
Larki-nay apni brother-ko dhakka-diya.	Larki-nay apnay brother-ko dhakka-diya.
Beti-nay apnay father-ko daikha.	Beti-nay apni father-ko daikha.
Aurat-nay apni husband-ko chorra.	Aurat-nay apnay husband-ko chorra.
Behn-nay apnay brother-ko pakra.	Behn-nay apni brother-ko pakra.
Admi-nay apna ball kho-de.	Admi-nay apni ball kho-de.
Larkay-nay apni chair daikhi.	Larkay-nay apna chair daikhi.
Baap-nay apni table baich-de.	Baap-nay apna table baich-de.
Nana-nay apni book kholi.	Nana-nay apna book kholi.
Aurat-nay apni garden daikha.	Aurat-nay apna garden daikha.
Maa-nay apna apple khaaya.	Maa-nay apni apple khaaya.
Larki-nay apna bag phainka.	Larki-nay apni bag phainka.
Daadi-nay apni pen uthaaya.	Daadi-nay apna pen uthaaya.

Appendix 6: Word Order-Verb Fillers

Matrix Language English

Sentence 1	**Sentence 2**
The girl the boy in the room at midnight daikha.	The girl daikha the boy in the room at midnight.
The grandmother uthaya the girl from the sofa in the morning.	The grandmother the girl from the sofa in the morning uthaay.
The boy maar-daala the man on the road last year.	The boy the man on the road last year maar-daala.
The woman the girl at the house yesterday dhakka-diya.	The woman dhakka-diya the girl at the house yesterday.
The man takar-maari the car on the road last night.	The man the car on the road last night takar-maari.
The boy the toy on the floor in the morning phainka.	The boy phainka the toy on the floor in the morning.
The wife the rug in her backyard last week dhoya.	The wife dhoya the rug in her backyard last week.
The girl torr-diya the pen in the classroom last week.	The girl the pen in the classroom last week torr-diya.

Matrix Language Urdu

Sentence 1	**Sentence 2**
Larki-nay saw larkay-ko kamray may aadhi raat ko.	Larki-nay larkay-ko kamray may aadhi raat ko saw.

Naani-nay larki-ko sofay say subha kay waqt picked.	Naani-nay picked larki-ko sofay say subha kay waqt.
Larkay-nay killed admi-ko sarak pay pichlay saal.	Larkay-nay admi-ko sarak pay pichlay saal killed.
Aurat-nay larki-ko ghar may kal pushed.	Aurat-nay pushed larki-ko ghar may kal.
Admi-nay gaari-ko road pay pichli raat hit.	Admi-nay hit gaari-ko road pay pichli raat.
Larkay-nay threw khilonay-ko zameen pay subha kay waqt.	Larkay-nay khilonay-ko zameen-pay subha kay waqt threw.
Bivi-nay washed qaleen-ko sehan may pichlay haftay.	Bivi-nay qaleen-ko sehan may pichlay haftay washed.
Larki-nay qalam-ko classroom may pichlay haftay broke.	Larki-nay broke qalam-ko classroom-may pichlay haftay.

Appendix 7: Word Order-Adposition Fillers

Matrix Language English

Sentence 1	**Sentence 2**
The cat is the chair neechay.	The cat is neechay the chair.
The paper was kept darmiyaan-may the books.	The paper was kept the books darmiyaan-may.
The girl slept andar the car.	The girl slept the car andar.
The mirrors hung the table ooper.	The mirrors hung ooper the table.
The boy walked the lake irrd-girrd.	The boy walked irrd-girrd the lake.
The woman stood paar the road.	The woman stood the road paar.
The bus went the bridge ooper.	The bus went ooper the bridge.
The kids sat saath the fence.	The kids sat the fence saath.

Matrix Language Urdu

Sentence 1	**Sentence 2**
Billi kursi-kay under hai.	Billi under kursi-kay hai.
Kaaghaz inbetween kitaabon-kay rakha-tha.	Kaaghaz kitaabon-kay inbetween rakha-tha.
Larki inside gaari-kay soie.	Larki gaari-kay inside soie.
Sheeshay maiz-kay above latkay-thay.	Sheeshay above maiz-kay latkay-thay.
Larka around jheel-kay chalta-raha.	Larka jheel-kay around chalta-raha.
Aurat sarrak-kay across kharri-rahi.	Aurat across sarrak-kay kharri-rahi.

Bus pul-kay over guzri.	Bus over guzri pul-kay.
Bachay along baithay baarh-kay.	Bachay baarh-kay along baithay.