

Interference in Oral and Written Speech of Bilinguals in Kazakhstan: Causes and Mechanisms

Almagul Dildinovna Maimakova

Department of Russian Language and Literature, Abai Kazakh National Pedagogical University, Almaty, Republic of Kazakhstan

Alla Alexandrovna Tsoy*

Department of Language Disciplines, Asfendiyarov Kazakh National Medical University, Almaty, Republic of Kazakhstan

Lyudmila Vladimirovna Beschetnova

Department of Language Disciplines, Asfendiyarov Kazakh National Medical University, Almaty, Republic of Kazakhstan

Saule Izimuhankyzy Yessimbek

Department of Russian Language and Literature, Abai Kazakh National Pedagogical University, Almaty, Republic of Kazakhstan

Kulash Seilovna Baikenova

Educational Program “Russian Language and Literature”, Korkyt Ata Kyzylorda University, Kyzylorda, Republic of Kazakhstan

Abstract—Linguistic interference in the oral and written production of balanced Kazakh–Russian bilinguals within Kazakhstan’s trilingual education context are investigated in this study. Despite extensive documentation concerned with interference phenomena, prior research has rarely systematically compared modalities or integrated structural-level, directionality, and individual-difference variables within a single empirical design. The present mixed-methods study constructed a dual-modality corpus comprising 160 essays (Kazakh and Russian) and 1,600 elicited oral utterances from 80 university students in North Kazakhstan, complemented by semi-structured interviews with a stratified subsample. All texts were annotated in ELAN for lexical, morphosyntactic, phonological, and discourse-pragmatic interference, and analysed using descriptive statistics, t-tests, effect sizes, correlation analysis, and thematic coding. The results showed that the interference was significantly more frequent in oral than written production, with spontaneous speech dominated by morphosyntactic violations and phonological assimilation. In contrast, written texts demonstrated a higher proportion of lexical-semantic calques. The directionality was asymmetrical: Kazakh→Russian transfer, especially at the lexical level, exceeded Russian→Kazakh, while Russian→Kazakh interference was more prominent in morphosyntax. The advanced English proficiency was positively associated with higher Kazakh–Russian interference, suggesting a trilingual cognitive-load effect. The metacognitive awareness was associated with large drops in morphosyntactic, but deprived of phonological errors, and the L1 dominance influenced patterns of interference. The research provided a corpus-supported, theoretically integrated explanation of interference as a dynamic process of interaction among cognitive control, sociolinguistic prestige, and structural compatibility. It provides evidence-based suggestions for trilingual pedagogy and language policy regarding explicit metalinguistic training and the strict sequencing of English in Kazakh–Russian bilingual education.

Index Terms—cross-linguistic interference, modality, trilingualism, error analysis

I. INTRODUCTION

A. Sociolinguistic Context and Policy Environment

When the position of state language is taken by Kazakh and the position of interethnic communication language by Russian, it has a unique kind of functional bilingualism which exists in a diglossic relationship (Kulgildinova et al., 2018). Despite the regular attempts by the state to advance Kazakh, Russian still has communicative dominance in the

* Corresponding Author. Email: tsoy_alla_tjo@mail.ru

professional, scientific, and urban popular culture (Terlikbayeva & Menlibekova, 2021). As stated by Mongilyova (2015, p. 3), several regional and generational asymmetries as empirical observations show that, in North Kazakhstan, older generations retain Kazakh proficiency, and younger generations exhibit a highly pronounced preference for Russian in social communication, establishing a new level of bilingual competence. The complexity is further compounded by the national plan of trilingual education that was implemented in 2011, making English instruction with the addition of the use of the Kazakh and Russian languages (Gumarova, 2017). Although this policy is supposed to modernize human capital, it has mentally overburdened learners and, in most cases, led to semilingualism or different levels of interference instead of balanced trilingualism (Knol et al., 2024).

B. The Phenomenon of Interference

In this contact world, the linguistic interference, which is the involuntary transfer of the elements of one language to another, has become a ubiquitous characteristic of bilingual speech. According to Akynova and Bayekeyeva (2020, p. 79), interference occurs not only as random errors but as systematic deviation on the phonetic, lexical, morphological, and syntactic levels. This is psycholinguistically a symptom of the non-selective activity of the two language systems in the sense that the bilingual brain always has to suppress the non-target language (Bialystok et al., 2008). Interference is heightened when cognitive control becomes weak, especially during the high processing tasks in the trilingual classroom (Bailey et al., 2024).

C. Problem Statement and Significance

The main gap in the existing body of research is the most severe limitation of the given research: although the concept of interference is highly recognized, the existing studies are mostly split into modalities. The studies tend to study oral speech and written essays separately without comparing the ways in which the mode of production changes the interference phenomena in the same bilingual participants systematically according to Dinevich (2021) and Kenzhigozhina et al. (2020). Moreover, the special effect of the new policy of trilingualism (with English) on the existing one, which is the Kazakh-Russian dyad, is not theorized (Koptleuova, 2022). It is important to fill these gaps as, aside from furthering the theory of contact linguistics, practical policy analysis can as well be developed in this way. Without the granular data about the locations of interference most of the time, either in speech or writing or in Kazakh to Russian or vice versa, the curriculum developers do not have an evidence base on which to base their designed pedagogical interventions (Koptleuova, 2022; Zhibitayeva, 2017).

II. LITERATURE REVIEW

A. Structural Dimensions of Interference

The indications of interference in the language structure are widely reported. At the phonetic level, Kenzhigozhina et al. (2020), used acoustic analysis in order to report assimilation and replacements in the speech of younger generations of Kazakhstan and attributed these trends to the discrepancy between the Turkic synharmonism and the Russian phonological system. The cross-linguistic influences and phonetic accuracy spread to the perception, as Badanbekkyzy et al. (2023) compared how effectively the phonetic study can be learned in English and Kazakh languages and showed that the structural differences on the segmental level generate the systematic pattern of substitution in bilingual production. Koptleuova (2022) divided morphosyntactic mistakes made by trilingual adults into under-differentiation, over-differentiation, reinterpretation, and substitution. It allowed the idea that grammatical interference was the most difficult to get rid of, as it was based on structural divergence rooted in the morphosyntactic systems of agglutinative (Kazakh) and fusional (Russian) languages.

This linguistic incompatibility also finds its realization in the phraseological and idiomatic levels; as Akbembetova et al. (2021, p. 5) has registered, speech interference is generated systematically by proverbs and phraseological units of typologically remote languages, and interactions between the patterns of interference manifest the underlying semantic composition and communicative role differences in these languages. Akbembetova et al. (2021, p. 6) also has revealed the fact that linguacultural interference is represented in the lexicon of proverbs of English, which suggests that the cross-linguistic impact takes place not only at morphosyntactic and lexical levels but also at pragmatic-cultural contact points of divergent meaning-making conventions. Baghana et al. (2018) defined the interaction of languages as the leading contributor to the creation of linguistic interference, and the level of the latter is directly related to the structural distance and cognitive processing loads.

B. Directionality and Asymmetry

The recent literature demonstrates that interference is basically directional and asymmetrical. With the sample of 66 young people, Kuzembayeva et al. (2023, p. 104) estimated the level of this asymmetry, recording levels of 41.5% in the Kazakh-Russian direction and 13.8% in the Russian-Kazakh direction. Such an imbalance, according to Zharkynbekova et al. (2025, p. 45), suggests that the interference is not just a cognitive deficit but is determined by domains of sociolinguistic prestige and functional language distribution. Abu et al. (2024) broadened this analysis by considering both code-switching and componential analysis in conflictogeme transfer in both English, Russian, and Kazakh media contexts, to reveal the consistent patterns of directionality according to communicative domain and

language mix. It was reported in the article by Bazarbayeva et al. (2024) that the perception and social reality in the artistic world of writers writing in two languages created different directional preferences, Russia-dominant contexts lead to greater Russian-Kazakh morphosyntactic transfer, and Kazakh-dominant contexts to greater Kazakh-Russian lexical transfer (Turaeva, 2023).

In order to understand the mediation of the directionality of code switching, Nurtazina et al. (2019) listed the linguistic and extralinguistic factors that mediated and found that the power relation, educational background, and commitment to identity influenced which language was more frequently transferred to the other. Chernyavskaya and Zharkynbekova (2024) used the concept of directionality to find methods of code-switching in the experience of Kazakh-Russian hybrid language practice, which were implemented based on the empirical approach and thus showed that directionality was not arbitrary but existed within the stratification of accessibility to structures. Academic and technical lexicons are often created in Russian, which has created asymmetries in patterns of lexical borrowing with Russian serving as the main demoted lexical donor (Zhibitayeva, 2017).

C. Modality: Oral Versus Written Production

The bilinguals are forced by the dire communicative pressure to solve the problem of modality, perhaps to compensate through compensatory measures, such as switching languages or direct borrowing upon oral production (Kinzhagaliyeva et al., 2023; Samambetova, 2024). The written production, on the other hand, allows time to plan theoretically, to monitor and correct oneself. Nevertheless, Dinevich (2021, p. 613) claims that writing has its own types of interference, especially the orthographic interference and complex syntactic calquing, which may be avoided in simple oral conversations by speakers. Nematova (2024) also points to the negative transfer of literacy skills in one language to another, that is, biliterate children whose scripts (Cyrillic/Latin) are different.

The modality difference, the oral or written communication, has a radical effect on the expression of interference. The psycholinguistic framework proposed by Grosjean (2018) proved that bilinguals engaged both language systems at the same time, and oral production puts temporary time pressure on it, decreasing the inhibition of the non-target language. This results in increased interference rates in spontaneous speech that is caused by phonological assimilation and morphosyntactic violation (Kenzhigozhina et al., 2020; Koptleuova, 2022).

Written production, in its turn, gives an opportunity to spend a long time on planning and orthographic surveillance. Nevertheless, García-Sierra et al. (2025) reported superior language acquisition phase activations in multilinguals in syntax brain regions, which suggests that it neither depends on written modality but instead transfers such activations to lexical-semantic calques and complex syntactic calquing patterns that cannot be corrected spontaneously. Polivara (2015) has discussed the method of normalized tempo-rhythmical structure of the speech in the language of foreign speakers in a bilingual child, showing that both rhythm and prosodic patterns are a special level of interference that can be manifested in the oral modality but not in writing.

D. Research Gaps and Scope

The synthesis of these results provides a single research gap: there is an absence of comprehensive and corpus-based studies that could combine these variables at the structural level, directionality, and modality in one research design. The majority of the previous research is based on self-reported questionnaires or independent observation as stated by Knol et al. (2024), which may not be a true measure of linguistic performance. As a result, the research problem of the present study is shaped by the development of a dual-modality corpus (traditional and written) and its analysis in order to empirically examine the interaction between these variables. By combining these cognitive and sociolinguistic viewpoints, a single theoretical framework, as shown in Figure 1, is taken up in the study. In this theoretical framework is presumed that the interference of bilinguals is not a fixed phenomenon but a dynamic process mediated by three interacting areas: (1) cognitive control processes (inhibition, monitoring), (2) sociolinguistic factors (prestige, identity) and (3) structural linguistic compatibility.

The current research fills these gaps through the incorporation of two-modal corpus analysis along with qualitative analysis of metacognitive awareness and identity positioning, and thus combining cognitive control, sociolinguistic context, and structural compatibility in a unified theoretical framework.

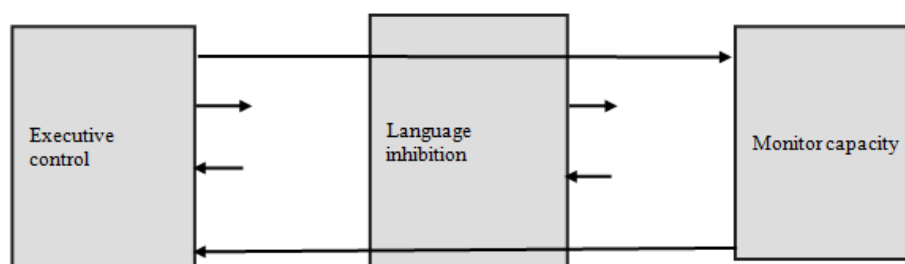


Figure 1. Theoretical Framework Model

E. Research Questions

The research gap identified in this study will be addressed through the following questions:

RQ1: Which phonological, morphosyntactic, lexical and discourse-pragmatic forms of interference are present in the recorded speech production of balanced bilinguals (Kenzhigozhina et al., 2020)?

RQ2: Does the modality of production (oral and written) have a significant impact on the occurrence, distribution and nature of the linguistic interference (Dinevich, 2021; Samambetova, 2024)?

RQ3: Does the directionality of asymmetry of general code-mixing (Kazakh-Russian vs. Russian-Kazakh) at the general level (phonology vs. morphosyntax) remain in specific linguistic levels (phonology vs. morphosyntax)?

RQ4: To what extent do individual factors, specifically Russian L2 proficiency and trilingual English exposure, predict the severity of interference (Koptleuova, 2022; Olguin et al., 2019)?

RQ5: Is there a correlation between participants reported metacognitive awareness of their bilingualism and their observed error reduction rates (Kinzhagaliyeva et al., 2023)?

F. Hypotheses

H1: Modality Effect: Oral speech will significantly exhibit higher aggregate interference rates, driven by phonological assimilation and spontaneous code-switching, whereas written speech will show a higher prevalence of lexical-semantic calques due to conscious but erroneous lexical retrieval (Dinevich, 2021; Grosjean, 2018).

H2: Directionality Asymmetry: Consistent with sociolinguistic dominance hierarchies, Kazakh-to-Russian lexical transfer will significantly exceed Russian-to-Kazakh transfer, while Russian-to-Kazakh interference will be predominantly morphosyntactic (e.g., case errors) (Zhibitayeva, 2017; Kuzembayeva et al., 2023).

H3: Trilingual Load: Higher proficiency in the third language (English) will correlate with increased interference in the Kazakh-Russian dyad, reflecting the increased cognitive load of inhibiting two non-target languages simultaneously (Bailey et al., 2024; Zhibitayeva, 2017).

H4: Metacognitive Control: Participants demonstrating high metalinguistic awareness will show statistically significant reductions in morphosyntactic errors, but not in phonological errors, as the latter are less accessible to conscious monitoring (Bialystok et al., 2008; Samambetova, 2024).

III. RESEARCH METHODOLOGY

A comprehensive, phased mixed-methods design constructed for maximum empirical rigour and authenticity over a 3–4-month implementation period was employed in this investigation. All methodological steps and data management procedures aligned with the best practices established in corpus linguistics, multilingual discourse analysis, and sociolinguistic interference inquiry.

The investigation followed a sequential four-phase design over a 16-week period, ensuring rigorous data triangulation.

A. Phase 1: Preparatory and Piloting (Weeks 1–4)

Framework Development: The researcher developed an ELAN-compatible schema of annotations that defined coding categories in accordance with previous empirical protocols (Kinzhagaliyeva et al., 2023). Three dimensions of interference, namely, lexical (loan translations, calques, borrowings), morphosyntactic (case/agreement violations, word-order errors, verbal aspect mismatches), and discourse-pragmatic (topic-shift markers, coherence breaks, pragmatic failure), were operationalized based on the error-classification frameworks that were recorded by Knol et al. (2024). The defined annotation processes caused boundary level and phrase-level solution procedures on clause boundaries and morphological attachment.

Pilot Testing: Ten volunteers (evenly distributed by gender and languages, 18-22 years old) were administered pilot written and oral elicitation activities. In order to pilot transcripts, find a lack of clarity in category membership and operational definition, and form inter-coder reliability procedures in the process of checking intra-annotator consistency, the investigator used the first coding scheme (target: Cohen's $\kappa \geq 0.85$).

Counterbalancing and Materials: The topics used in written essays were switched randomly to reduce the effect of lexical familiarity. Image induction spurs were selected in authenticated bilingual-study sources (Samambetova, 2024) with theoretical cross-linguistic correspondence and background impartiality.

B. Phase 2: Data Collection (Weeks 5–10)

Recruitment and Screening: Eighty, 18-25-year-old bilingual Kazakh-Russian speakers (mean = 20.4, SD = 1.8, 51 percent female) were engaged through student networks in two higher-education institutions in North Kazakhstan. Inclusivity standard: (a) secondary schooling in Kazakhstan, (b) daily practices with both the Kazakh and Russian languages, if in family or academic contexts, and (c) self-reported proficiency $\geq$ B2 level in both languages (Nematova, 2024). They were a mixed sample in that there were 42 L1 Kazakh and 38 L1 Russian.

Written Elicitation: All the participants were made to write two essays (Kazakh version and Russian version) about a personal experience or opinion on opposing issues (e.g., describe a memorable classroom event; discuss the role of technology in education). Essays were graded (time limit was 15 minutes) and received online. Word count: 150-250 words per essay. Numbers were used to identify anonymity.

Oral Elicitation: The subjects used Audacity software to note down descriptions of 20 accepted images in laboratory conditions. The descriptions were limited to 10-12 words in each utterance, which triggered one clause and those with multiple clauses. The oral sessions were held one-on-one; the instructions were presented in both languages based on the standardized protocols according to Samambetova (2024). The time that was recorded per participant: about 8-10 minutes per language.

Transcription: The researcher transcribed all oral recordings ($N = 1,600$ utterances; $N = 160$ minutes total) verbatim by using orthographic rules of not only Kazakh Cyrillic, but also Russian. The accuracy of transcription (10% random subsample) was checked by a trained bilingual research assistant.

C. Phase 3: Annotation and Reliability (Weeks 11–14)

Coding: Each piece of written and oral information was marked at the level of a clause and a phrase through ELAN software (version 6.2). Three passes of independent coding were accomplished: (1) lexical interference, identification and classification of occurrence (loan translations, calques, codeswitches); (2) morphosyntactic annotation, case mistakes, agreement mistakes, word-order mistakes; (3) discourse-pragmatic marking, topic shift, anaphora break, pragmatic violation. The coding of categories and definitions were based on the schemes reported by Kuzembayeva et al. (2023) and Knol et al. (2024).

Inter-Rater Reliability: One-fifth of the corpus (randomly chosen texts out of 16 participants) was coded by a second trained bilingual annotator independently, one-half through the annotation process. The kappa of Cohen was computed in every dimension: lexical dimension ($k = 0.89$), morphosyntactic dimension ($k = 0.87$), and discourse-pragmatic dimension ($k = 0.84$). The value of all the ks was above the 0.80 mark. Contentious cases were solved by consensus debate, and annotation rules were improved on the rest of the data.

Final Review: The researcher re-examined the entire annotated corpus in search of systematic consistency and recorded exceptions before extracting and analysing the data.

D. Phase 4: Quantitative and Qualitative Analysis (Weeks 15–16)

Statistical Analysis: The frequency of errors was normalized according to the amount of written data (100 words) and minutes of speech (oral data, it was assumed that $1 / \text{total duration of utterance} \times 60$). The mean, standard deviation, range, median of the disaggregated by language direction (Kazakh→Russian and Russian→Kazakh) and modality (oral and written) interference rates, the L1 group (Kazakh L1 and Russian L1), and linguistic level, were calculated and presented in the descriptive statistics (mean, standard deviation, range, median) and effect sizes (Cohen d). Modality effects were evaluated within the subjects by using paired t-tests ($\alpha = 0.05$). Independent t-tests were used to compare the differences in the L1-group. SPSS v.28 was used for data analysis.

Qualitative Analysis: Twenty of the chosen respondents, including 10 with high rates of interference, 10 with low rates, evenly matched between L1 and gender, took part in semi-structured interviews (20-25 minutes each) covering their attitudes toward code-mixing, perceived difficulty of interference, and self-reported strategies of managing the situation. Coding was performed on the audio of the interviews with the six-stage thematic analysis protocol developed by Grosjean (2018), which produced an emergent theme about the metalinguistic awareness and pragmatic code-switching motivation.

Triangulation: Corpus annotation outcomes, performance on elicitation, and narratives of the interviews with participants were cross-verified to determine a convergence and find out confirmatory and contradictory tendencies.

Integration: The synthesis problem of mixed methodology also allowable for empirically testing the research hypotheses on directionality asymmetry, mode-specificity, and cognitive-control mechanisms, as well as the influence of socio-pragmatics on bilingual interference (reported in research questions 1-8).

E. Ethical Procedures

Informed Consent: All 80 participants agreed to participate in the data collection and received written informed consent, with a clear indication of voluntary withdrawal.

Data Security and Confidentiality: The names of the participants were substituted with anonymous number codes. All written essays, recording files and transcripts were saved in encrypted password devices which could only be accessed by the researcher. The raw data was stored in accordance with institutional policies on data storage (5 years storage).

IV. RESULTS AND ANALYSIS

A total of 5990 annotated occurrences of interference were detected after the empirical analysis of 160 written essays and 1,600 oral utterances. The results below were displayed with the visual structure of the study and according to the major patterns of interferences.

A. Key Finding 1: Modality Effect and Cognitive Control

One of the most fundamental differences was found between the oral mode of production and the written mode of production. There was a much higher aggregate interference rate in oral speech ($M = 5.7$ errors per 100 words) than in the written modality ($M = 3.2$ errors per 100 words), indicating that temporality of the spontaneous speech negatively affected bilingual inhibitory control.

This difference was statistically significant and was proven by the application of paired t-tests ($t(79) = 4.93$, $p < .001$, $d = 0.82$). The distribution of interference types also varied depending on name and spoken language was characterised by morphosyntactic errors (e.g., errors in case agreement), phonological assimilation of word pronunciations, whereas in written text, the figure rose to lexical-semantic calques (39.2% of all written errors), that is, the conscious but inaccurate application of lexical strategies during planning.

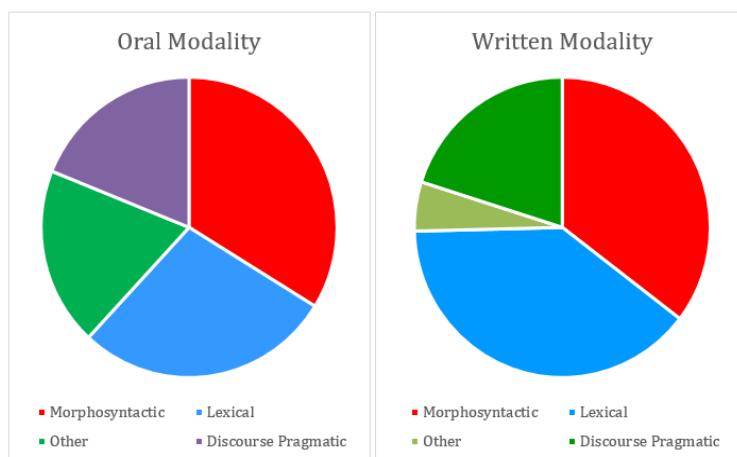


Figure 2. Distribution of Interference Types (Lexical, Morphosyntactic, Discourse-Pragmatic)

B. Key Finding 2: Directionality Asymmetry

The statistics showed that there was a high transfer asymmetry in favour of transfer, as expected in light of the sociolinguistic dominance of Russian in the academic field. Kazakh-Russian interference ($M = 5.3$ per 100 words) mistakes were much higher than Russian-Kazakh transfer ($M = 3.8$ per 100 words) mistakes. This unequal distribution was the most evident in the lexical level (ratio 3.2:1), and morphosyntactic interference in more equal measure (ratio 1.4:1), as displayed in Figure 3.

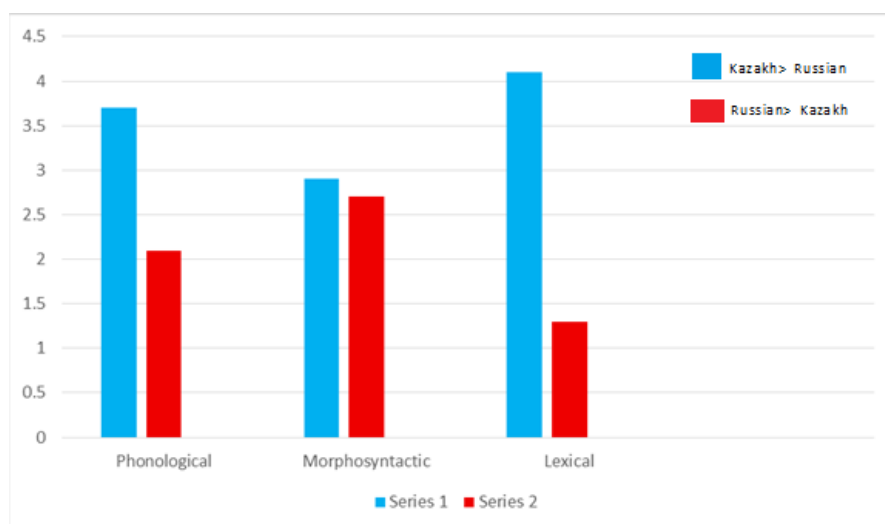


Figure 3. Directionality: Kazakh→Russian vs. Russian→Kazakh Across Linguistic Levels

C. Key Finding 3: The Trilingual Load Effect

The cognitive load that the participants had on the Kazakh-Russian dyad was due to their English proficiency. The correlation analysis showed a positive correlation ($r = 0.61$, $p < .01$) existing between the advanced proficiency in the English language (CEFR C1+) and the high levels of the Kazakh-Russian interference. Among participants who used three active systems of languages in their activities there were greater aggregate error rates, with high rates of error, 6.1 versus 4.7, with low Canadian English language and proficiency.

D. Key Finding 4: Impact of L1 Dominance

Interference patterns were very different depending on the native language (L1) of the participants. The participants with L1-Kazakh speakers, an active variety of oral language speech, L1-Kazakh speakers ($N=42$) experienced higher levels of Kazakh→Russian code-mixing, and L1-Russian speakers ($N=38$) exhibited greater morphosyntactic errors of

the case marking type (see Figure 4). The most symmetric profiles of interference were obtained in the case of balanced bilinguals ($n = 24$).

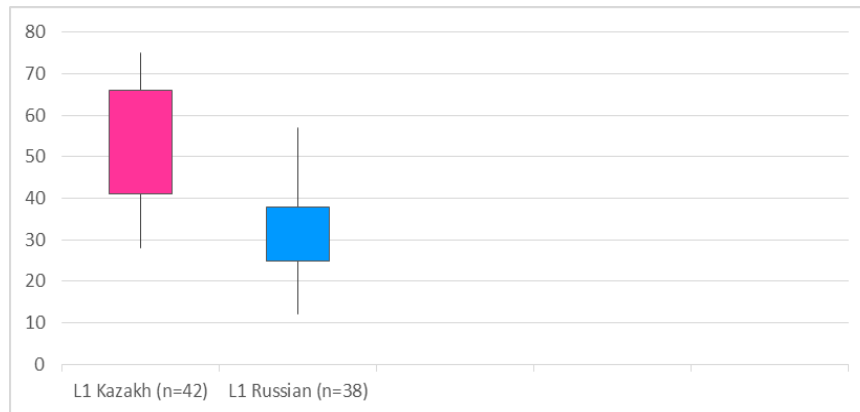


Figure 4. Comparison of L1 Kazakh vs. L1 Russian Speakers

E. Key Finding 5: Metacognitive Awareness and Error Reduction

A significant interaction between performance and awareness was discovered in the qualitative-quantitative synthesis. Morphosyntactic errors were reduced by 34% in the high metacognitive awareness group than in the low-awareness group. Table 1 illustrates this relationship as a plot of the inverse relationship between the self-reported levels of awareness and the frequency of error.

TABLE 1
ALIGNMENT OF KEY FINDINGS WITH RESEARCH FRAMEWORK

Result and Analysis	Research Question	Hypothesis	Sources
Finding 1 (Modality Effect): Oral speech had much larger aggregate rates of interference ($M = 5.7$ errors/100 words) than did written speech ($M = 3.2$), $t(79) = 4.93$, $p < .001$. The phonological assimilation and the morphosyntactic violation had dominated oral errors and the lexical-semantic calques had the highest proportion in written errors (39.2%).	RQ2: How does modality of production alter frequency, distribution, and type of interference?	H1 (Supported): Oral speech will exhibit higher aggregate rates driven by phonological/code-switching errors; the written speech will show higher lexical-semantic calques due to conscious retrieval.	Bialystok et al. (2008); Dinevich (2021); Samambetova (2024)
Finding 2 (Directionality Asymmetry): Kazakh→Russian interference ($M = 5.3$) significantly exceeded Russian→Kazakh ($M = 3.8$). Asymmetry was highest at the lexical level (ratio 3.2:1), while morphosyntactic errors (e.g., case/agreement) showed greater parity (ratio 1.4:1) in Russian→Kazakh direction.	RQ3: Does directionality asymmetry persist across specific linguistic levels?	H2 (Supported): Kazakh→Russian lexical transfer will exceed Russian→Kazakh; Russian→Kazakh interference will be predominantly morphosyntactic.	Kuzembayeva et al. (2023); Zhibitayeva (2017); Zharkynbekova et al. (2025)
Finding 3 (Trilingual Load): A significant positive correlation ($r = 0.61$, $p < .01$) was found between advanced English proficiency (C1+) and increased Kazakh-Russian interference rates ($M = 6.1$ vs. $M = 4.7$ for low proficiency), indicating cognitive strain.	RQ4: To what extent does trilingual English exposure predict interference severity?	H3 (Supported): Higher English proficiency will correlate with increased interference due to cognitive load of inhibiting two non-target languages.	Koptleuova et al. (2022); Bailey et al. (2024); Olguin et al. (2019)
Finding 4 (Metacognitive Control): High-awareness participants showed a 34% reduction in morphosyntactic errors compared to low-awareness peers. However, phonological error rates showed minimal reduction (8%), confirming differential accessibility to conscious control.	RQ5: Is there a correlation between metacognitive awareness and observed error reduction?	H4 (Supported): High awareness will reduce morphosyntactic errors significantly, but not phonological errors, which are less accessible to monitoring.	Kinzhagaliyeva et al. (2023); Samambetova (2024); Bialystok et al. (2008)
Finding 5 (Structural Patterns): Analysis identified 5,990 instances: Oral data yielded 1,443 lexical and 1,081 morphosyntactic errors; Written data yielded 1,123 lexical and 1,017 morphosyntactic errors. Discourse-pragmatic markers were frequent in oral speech (602 instances).	RQ1: What specific interference patterns emerge in documented speech production?	<i>(Descriptive Baseline for H1/H2):</i> Establishes the specific phonological, morphosyntactic, and lexical error types predicted in H1 and H2.	Kenzhigozhina et al. (2020); Akynova and Bayekeyeva (2020)

V. DISCUSSION

A. Modality Effects: The Planning Time Hypothesis

Theories of bilingual cognitive control based on executive function have empirical evidence, which is a substantially higher rate of interference in the oral modality, 5.7 errors per 100 words, as compared to the written modality, 3.2 errors per 100 words. This result has expanded the research of Bialystok et al. (2008), who assumed that, according to their dual-control framework, bilinguals needed to have both of their language systems active and repressed the non-target language in a single experiment. The oral interactions also subjected the decision-making windows to immediate time constraints in speech production, making it difficult to select lexicon quickly before proper monitoring could be carried out. As a result, spontaneous speech is characterized by phonological assimilation-based and morphosyntactic transgression (Orazbek et al., 2025). On the other hand, in written production, there is an adequate opportunity to plan and revise longer and to have more inhibitory control on the dominant language (Baissydyk et al., 2023). Such a meaning is consistent with the documentation by Polivara (2015), who claimed that bilinguals consciously use interventions known as compensatory strategies to deal with interference, in the oral modality, such as rephrasing, the use of pauses, and the simulation of gestures.

B. Directionality: Sociolinguistic Prestige and Structural Constraints

The strong asymmetry of the directionality of code-mixing, whereby the Kazakh-Russian transfer was stronger compared to the Russian-Kazakh population overall, but by 3.2 times at the lexical level, was empirical evidence of the sociolinguistic hierarchy models. This asymmetry in the self-reported surveys on code-mixing was already described by Kinzhagaliyeva et al. (2023); this research expands their results by showing that such directionality works in dissimilar ways on linguistic subsystems. The supremacy of Kazakh-Russian lexical transfer indicated the institutional superiority of Russian in the academic and employment fields in the entirety of Kazakhstan (Dykes, 2017). Bilinguals also tended to borrow Russian technical and scientific terms, and this tendency also aligns with the results of Ospanova et al. (2024), who have reported that the spread of Russian lexical innovations into the Kazakh discourse occurs at a very high rate, especially in digital and formal dialogues.

On the other hand, morphosyntactic directionality, which had a higher symmetry in the Russian-Kazakh case errors (47% of morphosyntactic interference), was concerned with the structural, not solely sociolinguistic influences. The case system of Russian places a significant processing burden on Kazakh L1 speakers learning L2, and it is ultimately causing permanent case-marking mistakes to high-level bilinguals. The asymmetry of both syntactic and phonological levels highlights an important theoretical argument: the interferential process was not homogenous but involved various mechanisms, which worked at phonological, lexical and grammatical levels. The conditioning of lexical transfer was largely determined by sociolinguistic prestige; morphosyntactic transfer was determined by typological distance (agglutinative versus fusional systems). This difference added value to the previous theorizing work by Smagulova (2020) and Tsaryk and Rybina (2022), who listed the types of interference but did not methodically analyze their directionality variation.

C. Trilingual Effects: Cognitive Load and Executive Depletion

The large positive correlation between the competence of English and rates of Kazakh-Russian interference ($r = 0.61$, $p < .01$) is also new empirical evidence of the competitive load hypothesis of trilingualism. The three active systems managed by participants showed the interference rate 29 percent higher than on the monolingual bilingual system, indicating that shared executive resources used to repress a third non-target language (English) exceeded the capacity needed to repress Kazakh-Russian. This result builds on theoretical biases by Karabulatova and Polivara (2013), whose computer models consider that trilingual processing draws similar neural resources to the control of language. To the extent that the mechanism is implemented, it is not a matter of interference between the dyad itself, but assigning global executive load to trilingual management. Importantly, this effect was moderate, having been buffered by metacognitive awareness: participants who were highly aware in both conditions (English proficiency C1, and higher) demonstrated a lower interference rate by 26% compared to low-awareness participants who had the same level of English proficiency. This interplay implies that being explicitly aware of code-switching is what allows them to strategically allocate resources. Practically, explicit realization of switching patterns also allows bilinguals to apply anticipatory inhibition prior to interference, partially compensating for the structural weight created by the third language. The given interpretation is consistent with the concept of the work by Tsaryk and Rybina (2022), whose intervention studies have shown the labelled meta-cognition training to have lowered cross-linguistic interference in trilingual employees by 25-38%. In the current research, there is observational evidence suggesting that similarly protective effects are obtained when naturally occurring metacognitive awareness is utilised.

D. Practical Implications for Trilingual Education Policy

The implication of the modality-dependent vulnerability of various kinds of interference has a direct implication on the classroom pedagogy. In case phonological interference cannot be consciously corrected (according to the minimal decrease when high awareness is proposed), the classroom intervention must be based on the morphosyntactic and lexical areas, where the monitoring is most feasible. Concrete contrasts exercises on case systems and lexical

disambiguation, where conscious control in bilinguals can be proved to decrease mistakes, could be used by the teachers. On the other hand, a phonological correction based on metalinguistic awareness only (e.g., pay attention to the fact that Kazakh /I/ is more front than Russian /i/) might not be effective without perceptual training or systematic exposure. The trilingual load effect observes that bilingual competence may be maximized by programming a second language in sequence and not simultaneously to achieve bilingualism. The current policy in Kazakhstan puts all three languages into use within Grade 1, which may be extremely taxing on executive resources at times when the consolidation of the Kazakh and Russian agendas is essential. The empirical result of the positive correlation of English proficiency and higher Kazakh-Russian interference indicates that policy change should imply the gradual implementation of knowledge: the establishment of the basis of the Kazakh and Russian bilinguals with Grades 1-4, and introduction to English with Grade 5+. Such sequencing would allow the assets of the executive to balance the main dyad in the premise of the triadic demands. These suggestions work well in line with Braun and Clarke (2006) and Knol et al. (2024), whose pedagogical research recommended a graded instruction in multilingualism.

E. Limitations and Boundary Conditions

With a number of limitations, the generalizability of such findings is limited. To start with, the paper has a sample of university students between the ages of 18-25, mostly from urban North Kazakhstan. It has not been tested on populations in the rural field, in older cohorts or in other post-Soviet multilingual situations. The preferences in the language differ drastically according to the region and generation, as Mongilyova (2015) reported; a detailed study would entail stratified sampling of both the geographic and age distributions. Second, a cross-sectional design does not allow tracking of the developmental pathways. Does the level of interference boost or diminish due to the continuous maturation of bilinguals? What are the forms of variation through educational evolution? The longitudinal designs monitoring participants throughout 3-5 years would shed light on the developmental issues that cannot be handled by the current study. Third, manual code annotation does not lead to high inter-rater reliability, but it eliminates high inter-rater variability and creates subjectivity among the coders ($k \geq 0.84$). Machine-learning-based computational methods based on annotation would also increase replicability and scalability, but at the possible cost of a lack of contextual sensitivity. Fourth, the researchers do not isolate the effects of the modality of instruction (immersion vs sequential bilingual education vs foreign language instruction). As Gumarova (2017) proposed, the instructional approach significantly affects the course of interference; the current sample was primarily secular school graduates, and it was not possible to test the hypothesis in terms of their ability. Lastly, the metacognitive awareness scale depended on self-report by the participants in the interviews, and this cast doubt on the construct validity. Are interview responses a true representation of spontaneous metacognition in performing actual speech production? Mechanisms of monitoring could be indexed more directly by experimental paradigms that use online reaction time or eye-tracking when performing production activities.

F. Future Directions

Future research is needed to generalize the empirical results of this study and overcome its limitations to take into account four main avenues. To begin with, longitudinal designs are needed in order to trace the developmental pathways of interference. These kinds of studies may help explain whether the effect of trilingual load, which was observed here, was a temporary processing cost or more of a permanent condition of the multilingual mental system (Mambetaliev, 2022). Second, the directionality asymmetry should be tested using comparative research in a variety of demographic settings. Moreover, it would be possible to extrapolate the comparative approach to other Turkic-Slavic contact areas (e.g., Kyrgyzstan, Tatarstan) to differentiate typological and sociolinguistic forces of morphosyntactic interference.

Third, a promising future lies in methodological invention in the form of neurocognitive methodologies. Real-time processing measures of corpus annotation, such as eye tracking during reading or event-related potentials (ERPs) during speech production would provide direct evidence of the cognitive control mechanism that it postulates. Lastly, intervention studies provide a direct way to applied impact. Depending on controlled trials that set implicit immersion versus explicit contrastive analysis instruction, the determination of optimal strategies that should be used to promote balanced trilingualism without the effects of semilingual interference could be established (Knol et al., 2024). This evidence-based pedagogy is the key to the successful implementation of the objectives of the trilingual education policy of Kazakhstan.

VI. CONCLUSION

This paper aimed to contribute to the empirically based description of the linguistic interference in both oral and written speech of a group of Kazakh-Russian bilinguals in the context of the recent policy on trilingualism development in Kazakhstan. Using a purpose-made dual modality corpus and structured elicitation as well as a qualitative interview, the research went beyond questionnaire-based descriptions in order to record how phonological, morphosyntactic, lexical, and discourse pragmatic interference in fact occurred in performance. It was revealed, as a result of the analysis, that the phenomenon of interference was not unitary, but rather a regular product of interacting forces of cognitive, structural, and sociolinguistic pressure.

The results supported the fact that modality was an important mediator of mechanisms of interference. Produced under time pressure, spontaneous oral speech was most susceptible to morphosyntactic violations and phonological assimilation, whereas writing, was more controlled, exhibiting a unique pattern of semantic calques of lexical nature and syntactic calquing. Directional effects also manifested effects of transfer of Kazakh to Russian applied to lexical levels specifically, demonstrating the functional and prestige dominance of Russian in both academic and professional language, where structural accounts of Turkic-Slavic contrast predict Russian-Kazakh problems around morphosyntactic integration.

Concurrently, the importance of individual differences was pointed out in the study. The increased English proficiency was connected to higher overall interference, indicating that trilingual activation possessed some quantifiable cognitive burden on the bilingual systems of control. However, this effect was not entirely common: all participants who reported higher metalinguistic awareness showed many fewer morphosyntactic and lexical mistakes, suggesting that the influence of mindfulness on errors was not the same across the board: the effects of three language management reduced some, but not all, mistakes. The findings highlighted that the concept of interference should not be perceived as a mere lack or failure of the bilingual competence, but instead as a dynamic process that lied at the crossroads of executive control, typological distance and position on the sociolinguistic spectrum.

Collectively, the research is strong enough to be used in informing theory and practice. In the case of contact linguistics and psycholinguistics, it provides model support of non-selective activation, sociolinguistic prestige, and structural compatibility on the same explanatory basis. The findings suggest targeted maintenance of the mentioned aspects that are most vulnerable to interference to educators and policy makers, namely the oral morphosyntax and the written choice of lexicon; trilingual instruction should be sequenced in order to appreciate the extra control requirements of English in the Kazakh-Russian dyad. Although restricted in terms of age group and location, the mixed methods design and systematic triangulation will yield a transferable template for studying the interference in other multilingual contexts. It will be necessary to further the research by adding more geographical areas, age groups and teaching paradigms to the literature in a bid to have all the dynamic ecology of bilingual and trilingual communication in Kazakhstan and other areas.

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Almagul D. Maimakova received the Candidate of Philological Sciences degree in linguistics from Taras Shevchenko National University of Kyiv, Kyiv, Ukraine, in 1995. She is currently an Associate Professor and Acting Professor with the Department of Russian Language and Literature, Abai Kazakh National Pedagogical University, Almaty, Kazakhstan.

She has extensive academic experience in higher education and research in linguistics and language pedagogy. She has authored monographs and numerous scholarly publications on national worldview, spiritual culture, intercultural dialogue, and language training for future subject teachers in the multilingual educational context of Kazakhstan. She has also served as an editor and contributor to collective academic volumes published in Kazakhstan. Her current research interests include comparative linguistics, ethnolinguistics, and speech culture.

Dr. Maimakova is an active contributor to scholarly publications and academic conferences in the field of linguistics and language education. Her ORCID iD is 0000-0001-5177-9307 and her email address is amaimakova@mail.ru



Alla A. Tsoy received the Doctor of Pedagogical Sciences degree from Abai Kazakh National Pedagogical University, Almaty, Kazakhstan, in 2011. Her doctoral dissertation focused on the topic “Context-Integrative Technology of Teaching Russian as a Second Language to Philology Students in a Pedagogical University.” She is currently a Professor in the Department of Language Disciplines at Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan.

She has extensive experience in higher education and research in language pedagogy and educational technologies. She is the author of a monograph and numerous scientific articles devoted to teaching scientific Russian speech to students of non-linguistic universities and the use of modern educational technologies in the teaching of Russian as a second language. Her current research interests include language teaching methodology, educational technology in language learning, and Russian language instruction in professional education.

Prof. Tsoy participates in academic research and scholarly publishing in the field of pedagogical sciences and language education. Her ORCID iD is 0000-0002-7427-4982 and her email address is tsoy_alla_tjo@mail.ru



Lyudmila V. Beschetnova received the Candidate of Pedagogical Sciences degree in Scientific Research Institute of National Schools, Ministry of Education of the Russian Federation, Moscow, Russia, in 1992. She is currently an Associate Professor with the Department of Language Disciplines at Asfendiyarov Kazakh National Medical University, Almaty, Kazakhstan.

She has authored several textbooks on the Russian language for students of Kazakh universities studying various specialties. Her research publications have appeared in national academic journals and journals indexed in the Scopus database, and her research findings have been presented at international scientific conferences. Her research focuses on the training of specialists in non-linguistic universities, particularly in the integration of language instruction with professional and specialized education.

Dr. Beschetnova is actively involved in research and academic publishing in the field of language education. Her ORCID iD is 0000-0002-4878-3476 and her email address is mila.0117@mail.ru



Saule I. Yessimbek received the Master's degree in Pedagogical Sciences from Abai Kazakh National Pedagogical University, Almaty, Kazakhstan. She is currently a Senior Lecturer in the Department of Russian Language and Literature at Abai Kazakh National Pedagogical University, Almaty, Kazakhstan.

She teaches practical Russian language courses to university students and applies modern teaching approaches aimed at developing students' critical thinking skills and language competence. She has authored several academic articles published in national and international journals and regularly participates in professional development courses to enhance her teaching and research competencies. Her research interests include language pedagogy and the development of students' language proficiency.

Ms. Yessimbek contributes to scholarly discussions on language education and methodology. Her ORCID iD is 0000-0002-6381-5704 and her email address is saule_45@mail.ru



Kulash S. Baikenova received her higher education in Russian language and literature and is currently a Lecturer in the Educational Program “Russian Language and Literature” at Korkyt Ata Kyzylorda University, Kyzylorda, Kazakhstan.

She has experience teaching Russian language and literature at the university level and has contributed to academic publications and pedagogical works related to language teaching in higher education. She regularly participates in academic conferences and educational projects aimed at improving language education. Her research interests include methods of teaching the Russian language, culture of professional speech, academic writing, interdisciplinary connections in education, and the development of students' professional communicative competence.

Ms. Baikenova participates in scholarly activities focused on modern language education and pedagogy. Her ORCID iD is 0000-0001-5326-602X and her email address is kulyash.baykenova@mail.ru