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PHONOLOGICAL ADAPTATION AND SEMANTIC CHANGE IN LEXICAL BORROWINGS BETWEEN MIDDLE INDO-ARYAN AND EASTERN IRANIAN LANGUAGES

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Abstract

This article examines the phonological and lexical-semantic characteristics of mutual lexical borrowings between the Middle Indo-Aryan and Eastern Iranian languages. Drawing upon lexical material from Buddhist Sanskrit, Pali, Prakrit, Gandhari Prakrit, Sogdian, Bactrian, Khotanese Saka, and Khwarezmian, the study analyzes the principal phonological adaptations and semantic transformations that occurred during the borrowing process. Particular attention is paid to changes involving vowels and consonants, as well as to semantic developments such as narrowing, broadening, metaphorical extension, metonymic transfer, and semantic stability. The findings demonstrate that lexical exchange between the two language groups was systematic and closely connected with long-term cultural, religious, economic, and political interactions between Central Asia and the Indian subcontinent. The study further reveals that Indo-Aryan influence was especially prominent in the spheres of religion, philosophy, medicine, and etiquette, whereas Eastern Iranian influence was reflected primarily in administration, military affairs, commerce, and material culture. The results contribute to a better understanding of historical language contact and provide new insights into the linguistic and cultural relations between the Indo-Aryan and Iranian-speaking communities of Eurasia.

Keywords: Middle Indo-Aryan languages, Eastern Iranian languages, lexical borrowing, language contact, phonological adaptation, semantic change, historical linguistics, etymology, Central Asia, Indian subcontinent.

Abstract

Dieser Artikel untersucht die phonologischen und lexikalisch-semantischen Eigenschaften wechselseitiger Lehnwortübernahmen zwischen den mittelindoarischen und ostiranischen Sprachen. Auf der Grundlage lexikalischen Materials aus dem buddhistischen Sanskrit, Pali, Prakrit, Gandhari-Prakrit sowie aus dem Sogdischen, Baktrischen, Khotan-Saka und Choresmischen analysiert die Studie die wichtigsten phonologischen Anpassungen und semantischen Transformationen, die im Verlauf des Entlehnungsprozesses stattgefunden haben. Besonderes Augenmerk gilt dabei Veränderungen im Vokal- und Konsonantensystem sowie semantischen Entwicklungen wie Bedeutungsverengung, Bedeutungsverbreiterung, metaphorischer Erweiterung, metonymischer Übertragung und semantischer Stabilität. Die Ergebnisse zeigen, dass der lexikalische Austausch zwischen den beiden Sprachgruppen systematisch verlief und eng mit langfristigen kulturellen, religiösen, wirtschaftlichen und politischen Interaktionen zwischen Zentralasien und dem indischen Subkontinent verbunden war. Darüber hinaus wird deutlich, dass der Einfluss der indoarischen Sprachen insbesondere in den Bereichen Religion, Philosophie, Medizin und Etikette besonders stark ausgeprägt ist, während der ostiranische Einfluss vor allem in Verwaltung, Militärwesen, Handel und materieller Kultur sichtbar wird. Die Resultate tragen zu einem besseren Verständnis des historischen

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Sprachkontakts bei und liefern neue Erkenntnisse über die sprachlichen und kulturellen Beziehungen zwischen den indoarischen und iranischsprachigen Gemeinschaften Eurasiens.
Schlüsselwörter: mittelindoarische Sprachen, ostiranische Sprachen, lexikalische Entlehnung, Sprachkontakt, phonologische Anpassung, semantischer Wandel, historische Linguistik, Etymologie, Zentralasien, indischer Subkontinent.

Аннотация

В данной статье исследуются фонологические и лексико-семантические особенности взаимных заимствований между среднеиндийскими и восточноиранскими языками. На основе лексического материала буддийского санскрита, пали, пракрита, гандхари-пракрита, а также согдийского, бактрийского, хотано-сакского и хорезмийского языков анализируются основные фонологические адаптации и семантические трансформации, происходившие в процессе заимствования. Особое внимание уделяется изменениям в системе гласных и согласных, а также семантическим процессам, таким как сужение значения, расширение значения, метафорическое расширение, метонимический перенос и семантическая устойчивость. Результаты исследования показывают, что лексический обмен между двумя языковыми группами носил системный характер и был тесно связан с длительными культурными, религиозными, экономическими и политическими контактами между Центральной Азией и Индийским субконтинентом. Кроме того, установлено, что влияние индоарийских языков особенно заметно в сферах религии, философии, медицины и этикета, тогда как восточноиранское влияние преимущественно проявляется в области административной системы, военного дела, торговли и материальной культуры. Полученные результаты способствуют более глубокому пониманию исторических языковых контактов и предоставляют новые данные о языковых и культурных связях между индоарийскими и иранскими языковыми сообществами Евразии.
Ключевые слова: среднеиндийские языки, восточноиранские языки, лексическое заимствование, языковой контакт, фонологическая адаптация, семантические изменения, историческая лингвистика, этимология, Центральная Азия, Индийский субконтинент.

INTRODUCTION

The historical interaction between the Indo-Aryan and Iranian peoples constitutes one of the most significant processes in the cultural and linguistic history of Central and South Asia. Throughout antiquity and the early medieval period, extensive political, economic, religious, and cultural contacts between these populations created favorable conditions for sustained linguistic exchange. As a result, a considerable number of lexical items were transferred between the Middle Indo-Aryan languages (including Pali, Prakrit, Buddhist Sanskrit, and Gandhari Prakrit) and the Eastern Iranian languages (such as Sogdian, Bactrian, Khotanese Saka, and Khwarezmian).

The study of lexical borrowing is of particular importance for historical linguistics because loanwords preserve valuable evidence regarding intercultural communication, language contact, and the transmission of cultural concepts across linguistic boundaries. In the case of Middle Indo-Aryan and Eastern Iranian languages, lexical borrowings provide crucial data for reconstructing the historical relations between the Indian subcontinent and Central Asia, especially in connection with the spread of Buddhism, the development of trade networks along the Silk Road, and the diffusion of administrative, religious, and technological innovations.

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Despite the existence of numerous studies devoted to individual loanwords and etymological problems, the phonological and semantic mechanisms underlying mutual lexical borrowing between these two linguistic groups have not yet received comprehensive and systematic treatment. Previous scholarship has often focused either on the identification of loanwords or on the historical circumstances of language contact, while comparatively less attention has been paid to the regular patterns of phonological adaptation and semantic transformation that accompanied the borrowing process. Consequently, many questions remain unresolved, including the extent to which recipient-language phonological constraints influenced the adaptation of foreign lexical items, the semantic shifts that occurred after borrowing, and the relationship between linguistic change and broader cultural interaction.

The scientific relevance of this study lies in its attempt to analyze lexical borrowings between Middle Indo-Aryan and Eastern Iranian languages as an integrated phenomenon involving both phonological and semantic dimensions. Such an approach makes it possible not only to identify the mechanisms of linguistic adaptation but also to reveal the cultural and historical factors that conditioned lexical exchange. Furthermore, the investigation contributes to a better understanding of the role of language contact in the evolution of the linguistic landscape of Central and South Asia.

RESEARCH AIM AND OBJECTIVES

Research Aim

The aim of this study is to investigate the phonological and lexical-semantic characteristics of mutual lexical borrowings between the Middle Indo-Aryan and Eastern Iranian languages, and to identify the linguistic and cultural factors that shaped the processes of lexical exchange between these two language groups.

Research Objectives

To achieve this aim, the study pursues the following objectives:

1. To identify and classify lexical borrowings exchanged between the Middle Indo-Aryan and Eastern Iranian languages.
2. To examine the principal phonological adaptations that occurred during the borrowing process and to determine the regular patterns governing these changes.
3. To analyze vowel and consonant modifications in loanwords and evaluate their relationship to the phonological systems of the recipient languages.
4. To investigate the major types of semantic change observed in borrowed vocabulary, including semantic narrowing, semantic broadening, metaphorical extension, metonymic transfer, and semantic stability.
5. To determine the extent to which cultural, religious, economic, and political interactions influenced lexical borrowing between the two linguistic communities.
6. To assess the role of linguistic contact in shaping the historical development of the Middle Indo-Aryan and Eastern Iranian lexicons.
7. To contribute to the reconstruction of historical relations between Central Asia and the Indian subcontinent through the analysis of lexical evidence preserved in the two language group

RESEARCH METHODOLOG

The study employs the comparative-historical, descriptive, phonological analysis, lexical-semantic analysis, and etymological methods. The comparative-historical method is used to identify lexical

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borrowings and establish correspondences between Middle Indo-Aryan and Eastern Iranian languages. Phonological analysis is applied to examine sound changes in borrowed words, while lexical-semantic analysis is used to investigate semantic developments, including narrowing, broadening, metaphorical extension, and metonymic transfer. The etymological method facilitates the determination of the origin and transmission routes of loanwords. The findings are interpreted within a contact-linguistic framework in order to reveal the historical and cultural factors underlying lexical exchange between the two language groups.

RESULTS, ANALYSIS AND DISCUSSION

It is well known that in the lexicon of Middle Indo-Aryan languages, such as Buddhist Sanskrit, Pali, and Prakrit, words typically terminate in a short vowel -a in its zero form. Examples include ṣaṃna (“hemp”) and pustaka (“book”). This feature is generally absent in the Eastern Iranian languages, although it is partially attested in Bactrian. For instance, the word meaning “tax collector” appears as āket in Sogdian, whereas in Bactrian it is attested in the form agedə. [Schoubben N., P.80] In other words, the Sogdian stem ends in a consonant, while the Bactrian form terminates in the vowel ə. From this perspective, lexical borrowings from Middle Indo-Aryan languages rarely preserve the final short -a. The Bactrian examples should therefore be interpreted not as evidence of phonological adaptation during the borrowing process, but rather as a manifestation of the language’s internal phonological structure.

In general, the vocalic phonology of these loanwords does not exhibit a consistent pattern, and some forms occur only as hapax legomena.

Unlike the Indo-Aryan languages, the Eastern Iranian languages lack aspirated consonants. Consequently, it is natural that Indo-Aryan lexical items containing aspirated consonants underwent various phonological adaptations when they were borrowed into the Eastern Iranian linguistic environment.

For example:

a) The aspirated consonant bh was, in certain cases, replaced by the labiodental fricative β. For instance, Prakrit bhojate (“to rejoice”) corresponds to Old Khwarezmian βž. In other cases, however, bh was adapted as the plosive b, as illustrated by Prakrit bhojana (“food; meal”), which appears as būjsana in Khotanese Saka. [Turner R.L., P. 540]

b) The aspirated consonant th was generally transformed into the plosive t during the borrowing process. For example, the Sanskrit, Pali, and Prakrit word sārtha (“wealthy”, “prosperous”) is attested in Sogdian as sārt. [Gharib B., P. 351]

c) The aspirated consonant dh underwent different phonological adaptations. In some instances, it developed into the fricative δ, as in Buddhist Sanskrit and Pali vadhu (“wife”), which corresponds to Sogdian wauδ. In other cases, it was replaced by the plosives d or t. Examples include the river name Sindh in Sanskrit, Prakrit, and Pali, which appears as Sind in the Eastern Iranian languages, and Prakrit pindhapāta (“beggar; alms-seeker”), which is attested in Sogdian as pintapat. [Gharib B., P. 335]

d) The aspirated consonant gh underwent phonological modification during the borrowing process and was most commonly adapted as k. For example, Buddhist Sanskrit or Prakrit ghaṇṭikā (“bell”) appears as kantik in Sogdian and Khotanese Saka. [Gharib B., P. 395]

e) The aspirated consonant kh generally lost its aspiration in the course of borrowing and was adapted as the plain velar stop k in the Eastern Iranian languages. An example is Sanskrit śaṅkha (“conch shell”), which is attested in Sogdian as šunk. [Cheung J., P. 333]

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In addition, several consonants in loanwords exhibit notable phonological divergences. For example:

a) The voiced consonant j was occasionally replaced by the voiceless affricate č in borrowed forms. An example is the word kojava (“woollen cloth”), which appears in Bactrian as kaučapa.

b) The consonant l underwent various phonological transformations in loanwords. One of the principal reasons for this phenomenon is the absence of the phoneme l in certain Eastern Iranian languages, particularly Sogdian. Consequently, l was adapted in different ways. In some cases, it was replaced by the phonetically similar consonant r, as in Buddhist Sanskrit indiranīla (“indigo-blue precious stone”), which corresponds to Sogdian əndrnir. [Gharib B., P. 17] In other cases, l developed into δ, as illustrated by Buddhist Sanskrit loka (“world”), attested in Sogdian as δoka. [Gharib B., P. 146] Elsewhere, it was replaced by b, as in Pali āmlaka (a fruit name), which appears in Sogdian as ambak.

c) The consonant v of the donor Middle Indo-Aryan languages also displays several adaptation patterns in Eastern Iranian borrowings. It appears as β in forms such as Buddhist Sanskrit vihāra (“monastery”), reflected in Bactrian as βaharo, and Buddhist Sanskrit nirvāṇa (“liberation from the cycle of rebirth”; “ultimate truth”), attested in Sogdian as nirβan. [Gharib B., P. 252] In other cases, v corresponds to f, as in Buddhist Sanskrit vihāra and its Sogdian counterpart farxār. [Cheung J., P. 269] It may also be rendered as w, as seen in Pali vadhu (“wife”), which appears as waud in Sogdian and wud in Old Khwarezmian. [Gharib B., P. 402]

d) The Indo-Aryan consonant ś generally corresponds to the Eastern Iranian consonant š, reflecting their close phonetic equivalence. However, in certain borrowings ś was replaced by č. This development is particularly characteristic of Sogdian. For example, Sanskrit ākāśa (“sky”, “space”, “cosmos”) appears in Sogdian as ākāč. [Gharib B., P. 6] Given that č was one of the most productive and frequently occurring consonants in Sogdian, this phonological adaptation may reasonably be attributed to the language’s internal phonetic tendencies.

Overall, lexical borrowings from Middle Indo-Aryan languages into the Eastern Iranian languages exhibit a considerable degree of phonological modification. These changes indicate that the borrowing process was both complex and multi-layered, involving extensive adaptation to the phonological systems of the recipient languages.

Phonological Changes in Lexical Borrowings from Eastern Iranian Languages into Middle Indo-Aryan Languages

Words borrowed from the Eastern Iranian languages into the Middle Indo-Aryan languages likewise display various phonological modifications, reflecting their adaptation to the phonetic and phonological constraints of the recipient languages. The principal phonological developments are outlined below.

I. Phonological Changes Involving Vowels

As noted above, stems in the Eastern Iranian languages generally terminate in a consonant, whereas in the Indo-Aryan languages words typically end in a short vowel -a following the final consonant. Consequently, Eastern Iranian loanwords ending in a consonant were frequently adapted in Pali, Prakrit, and other Middle Indo-Aryan languages by the addition of a final short -a. For example, the Sogdian word namat (“felt”) was borrowed into Prakrit as namata, while the ethnonym (H)un entered Prakrit in the form huna. [Schoubben N., P.191]

Words ending in the vowel ə, a feature particularly characteristic of Bactrian, exhibit several patterns of phonological adaptation when borrowed into Indo-Aryan languages. For example:

a) The final vowel ə was often replaced by a short a. Thus, Bactrian agedə (“tax collector”) appears in Prakrit as ageta, while taravarə (“sword”) was borrowed as taravara.

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b) In some cases, the final ə was replaced by i. For instance, the Bactrian word prahonə was borrowed into Prakrit in the form prahoni.

According to the linguist N. Shoubben, word stems ending in u or o are not consistent with the internal phonological norms of the Middle Indo-Aryan languages. [Schoubben N., P.80] Rather, such forms should be regarded as the result of influence from foreign donor languages and are typically confined to loanwords. On this basis, he identifies Prakrit words such as ogu (a title), ratu ("Zoroastrian priest"), and piro ("fortress") as borrowings and proposes Bactrian as their donor language, since stems ending in u and o occur with notable frequency in Bactrian.

II. Phonological Changes Involving Consonants

a) The velar and uvular fricatives γ and x were not native phonemes of the Indo-Aryan languages. In contrast, these sounds were present in the phonological systems of the Eastern Iranian languages. Consequently, loanwords containing γ and x underwent phonological adaptation when borrowed into Middle Indo-Aryan. The consonant γ was generally replaced by g. For example, the Sogdian word azγar appears in Gandhari Prakrit as aṣgara ("messenger"). Likewise, the fricative x was commonly adapted as the aspirated consonant kh. An example is Prakrit kharavarna ("grey-coloured"), which is considered an Eastern Iranian borrowing and is ultimately derived from the Iranian word xara ("donkey").

b) Many loanwords containing the consonant l entered the Middle Indo-Aryan languages through direct linguistic contact with Bactrian. A characteristic feature of Bactrian phonology was lambdacism, whereby l occurred in positions corresponding to d in other Eastern Iranian languages. This feature is evident even in words that were not originally Bactrian but entered Indo-Aryan through Bactrian mediation. For example, the Old Persian word dipi ("inscription", "writing", "document") was borrowed into Bactrian as lipi and subsequently entered the Middle Indo-Aryan languages in that form. Similarly, the word lastuga ("headscarf"), borrowed from Bactrian into Prakrit, corresponds to dastār in other Iranian languages. [Schoubben N., P.168]

c) The phoneme z was likewise absent from the phonological inventory of the Middle Indo-Aryan languages. As a result, the donor-language z was adapted through several different phonological substitutions. In some cases, it was rendered as the aspirated affricate jh, as in Khotanese Saka hinaza ("commander"), which appears in Prakrit as hinajha. In other cases, it was represented by the retroflex sibilant ṣ, as illustrated by Sogdian azγar and its Prakrit counterpart aṣgara ("messenger"). Elsewhere, z was replaced by the retroflex stop ḍ, as in Bactrian az ("to release", "to set free"), which appears in Prakrit as oḍ.

d) Loanwords containing the consonant cluster rd in the Eastern Iranian languages were frequently adapted as the retroflex stop ṭ in the Middle Indo-Aryan languages. For example, the Bactrian word ard ("flour", "wheat flour") was borrowed into Prakrit as aṭa.

Lexical-Semantic Features of Loanwords

The process of mutual lexical borrowing between the Middle Indo-Aryan and Eastern Iranian languages cannot be regarded merely as a product of phonological adaptation; it is also characterized by complex semantic transformations. The most common types of semantic change observed in loanwords may be classified as follows:

a) Semantic Narrowing

This process is particularly evident in religious and philosophical borrowings. For example, the Buddhist Sanskrit word vihāra, which originally denoted a broad concept such as "dwelling," "abode," or "residence," was borrowed into Bactrian as βaharo and into Sogdian as farxār, where it came to designate specifically a Buddhist monastery. [Gharib B., P. 122] Likewise, the Middle

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Indo-Aryan word upāsaka ("pious devotee," "lay follower") acquired the more specialized meaning of "Buddhist monk" after being borrowed into Sogdian. [Gharib B., P. 56]

b) Semantic Broadening

Semantic broadening is also attested in several groups of borrowings. For instance, the Buddhist Sanskrit word janapada, meaning "country," "realm," or "territory inhabited by a people," entered Sogdian as əfčanpaδ and acquired the broader meaning of "the world" or "existence." [Gharib B., P. 18]

c) Metaphorical Extension

This type of semantic change is typically observed when the meaning of a borrowed word shifts from a concrete, material concept to an abstract ontological one. A notable example is the Sanskrit, Prakrit, and Pali word nirvāṇa, whose original meaning was "extinction," "cessation," or "disappearance." Borrowed into Sogdian as nirβān, it came to signify "spiritual liberation" and "release from the cycle of rebirth." [Gharib B., P. 252] This semantic transformation was undoubtedly influenced by the doctrinal framework of Buddhism.

d) Metonymic Extension

In metonymic change, the meaning of a borrowed word shifts on the basis of conceptual association. Such developments may involve either a whole-to-part or a part-to-whole relationship.

An example of a whole-to-part shift is provided by the Iranian word ratu, which originally referred to the legal-religious order or institutional framework of Zoroastrianism. When borrowed into Middle Indo-Aryan, the term retained its form but came to denote a "priest" or specifically a "Zoroastrian priest." Thus, an institutional concept was reinterpreted as the individual who embodied or represented that institution.

Examples of part-to-whole metonymic extension may also be observed. The Sanskrit and Prakrit word sārtha, meaning "wealthy person" or "merchant," entered Sogdian as sart and developed the meaning "caravan" or "group of merchants." [Gharib B., P. 351] In this case, a noun referring to an individual was extended to denote a broader social and economic institution.

Similarly, the Prakrit expression pindha-pāta, literally meaning "barefoot," was borrowed into Sogdian as pintapat and came to mean "beggar" or "mendicant." [Gharib B., P. 335] Here, a characteristic physical feature became a designation for the person associated with it.

e) Semantic Stability

In some cases, loanwords underwent phonological adaptation while preserving their original meanings. Such borrowings may be regarded as lexical transfers of cultural realia. Examples include Sogdian šunk (from Prakrit śaṅkha), ambak (from Prakrit/Pali āmlaka), and kantik (from Buddhist Sanskrit ghaṇṭikā). [Gharib B., P. 191] Likewise, Prakrit borrowings such as namata (from Sogdian namat), śadavida (from Bactrian sadəvidə), and lastuga (from Bactrian lastugə) retained their original semantic content. [Schoubben N., P. 191]

Semantic Dominance and Cultural Interaction

An examination of mutual borrowings in both linguistic strata reveals the operation of the principle of semantic dominance. The semantic fields in which loanwords are most frequently encountered often reflect the leading cultural, intellectual, or institutional influence of the donor civilization.

Analysis of lexical borrowings from the Middle Indo-Aryan languages into the Eastern Iranian languages demonstrates that the Indian cultural sphere exerted a substantial influence upon the peoples of Central Asia, particularly in the domains of religion, philosophy, medicine, and etiquette. Conversely, the Iranian-speaking populations of Central Asia influenced the peoples of the Indian subcontinent in areas such as administration, military organization, commerce, and textile production.

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This pattern of lexical exchange indicates that cultural prestige and functional necessity served as the principal determinants of borrowing, shaping the direction and intensity of linguistic interaction between the two regions.

CONCLUSION

The present study has demonstrated that lexical borrowing between the Middle Indo-Aryan and Eastern Iranian languages constituted a multidimensional process involving both phonological adaptation and semantic transformation. The analysis confirms that linguistic exchange between the two language groups was neither sporadic nor superficial; rather, it reflects long-term and intensive cultural, religious, economic, and political contacts between the populations of Central and South Asia.

The examination of phonological developments has shown that borrowed lexical items were systematically adapted to the phonological structures of the recipient languages. In borrowings from Middle Indo-Aryan into Eastern Iranian languages, aspirated consonants, final vowels, and several other phonemes underwent regular modifications in accordance with the phonetic constraints of the recipient languages. Conversely, borrowings from Eastern Iranian into Middle Indo-Aryan languages reveal comparable adaptation processes, including the treatment of consonant-final stems, the substitution of non-native phonemes, and the restructuring of consonant clusters. These findings demonstrate that phonological adaptation followed identifiable patterns rather than occurring randomly, thereby reflecting the internal linguistic norms of the recipient languages.

The semantic analysis has further revealed that lexical borrowing was frequently accompanied by shifts in meaning. Processes such as semantic narrowing, semantic broadening, metaphorical extension, metonymic transfer, and semantic stability were identified in both linguistic traditions. These developments indicate that loanwords were not merely transferred as linguistic forms but were actively integrated into the conceptual systems of the recipient communities. Consequently, semantic change emerged as an important mechanism through which foreign lexical items acquired new cultural and communicative functions.

The study also confirms the existence of a clear relationship between lexical borrowing and cultural influence. The predominance of religious, philosophical, medical, and ethical terminology of Indo-Aryan origin in Eastern Iranian languages reflects the significant intellectual and spiritual influence of the Indian cultural sphere, particularly through the dissemination of Buddhism. At the same time, the presence of Iranian loanwords in the domains of administration, military affairs, commerce, and material culture within Middle Indo-Aryan languages demonstrates the substantial contribution of Iranian-speaking communities to the socio-economic life of the wider region.

Thus, the research addresses the principal issues outlined in the introduction by identifying the major phonological and semantic mechanisms that governed mutual lexical borrowing between Middle Indo-Aryan and Eastern Iranian languages. The findings contribute to a deeper understanding of historical language contact in Central and South Asia and provide further evidence that lexical borrowings constitute an important source for reconstructing intercultural relations, patterns of cultural transmission, and the historical dynamics of linguistic interaction across Eurasia.

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