Sanskrit, Metalinguistic Awareness, and the Transfer Question: What the Evidence on Classical-Language Study Implies for India's Multilingual Classroom

Bhāṣā-Śikṣaṇa: Classical Language Pedagogy

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Abstract

Claims that studying Sanskrit confers general cognitive benefits — sharper memory, improved logical reasoning, enhanced overall intelligence — circulate widely in Indian educational discourse and increasingly inform curricular decisions under India's National Education Policy (NEP) 2020, yet such claims are rarely traced to controlled research. This paper examines what the empirical literature on classical-language study and metalinguistic awareness actually supports, and what it does not. Drawing on bilingualism research, the linguistic interdependence hypothesis, a large-scale controlled study of Latin instruction, the single directly relevant empirical study of Sanskrit schooling, and research on Indic-script orthographic transparency, the paper argues that a narrow, defensible case exists for near-transfer benefits — chiefly lexical and morphological awareness transferring to cognate Indo-Aryan languages such as Hindi — while the broader claims of domain-general cognitive enhancement common in popular and policy-adjacent literature lack adequate evidentiary support and are vulnerable to the same preselection confound identified in the Latin-transfer literature. The paper concludes with implications for how Sanskrit instruction under NEP 2020's three-language formula should be evaluated and marketed to avoid overpromising.

Keywords: Sanskrit pedagogy; metalinguistic awareness; cross-linguistic transfer; classical language study; multilingual education; National Education Policy 2020; cognitive transfer

1. Introduction

India's National Education Policy 2020 gives Sanskrit a distinctive place among Indian languages, offering it as an option within the three-language formula at every level of school and higher education (Ministry of Education, Government of India, 2020). This policy choice is frequently defended, in both official and popular commentary, on cognitive as well as cultural grounds: that studying Sanskrit sharpens memory, trains logical thinking, and generally strengthens the developing mind. A brief survey of the popular literature aimed at parents and schools shows how pervasive and how thinly sourced these claims typically are — phrases such as "studies show" and "research indicates" recur constantly, almost never accompanied by a citation, a sample size, or a comparison group.

This paper asks a narrower and more answerable question than the popular literature poses. Rather than asking whether Sanskrit is cognitively beneficial in some general sense, it asks what the empirical literature on classical-language

study, bilingualism, and metalinguistic awareness would predict and permit us to claim, and it tests the popular claims against that literature. This question matters for curriculum policy: NEP 2020's multilingualism agenda deserves an evidentiary foundation appropriate to its ambition, and the difference between a defensible near-transfer claim and an inflated far-transfer claim has direct consequences for how schools should teach, and evaluate, Sanskrit.

The paper's central argument is that a genuine, evidence-consistent case for Sanskrit's linguistic value exists, but it is narrower and more specific than the popular case: it rests on lexical and morphological relatedness to the Indo-Aryan languages that most Indian schoolchildren already speak, and on the general, well-established relationship between phonological awareness and orthographic transparency in Indic scripts, rather than on any special property of Sanskrit as an ancient or classical language per se. The broader claims of domain-general cognitive enhancement, by contrast, are structurally similar to claims made for Latin instruction in Europe, where large controlled studies have found that apparent Latin-student advantages are substantially explained by which students choose to study Latin in the first place.

2. Background and Context

NEP 2020 retains and extends the three-language formula first introduced in 1968, requiring that school students study three languages, at least two of which are native to India, while explicitly naming Sanskrit as an available option at every level and citing multilingualism's contribution to "cognitive development" among the policy's stated rationales (Ministry of Education, Government of India, 2020). This framing has been amplified in the educational marketplace: school websites, tutoring platforms, and parenting media routinely list claimed cognitive benefits of Sanskrit study — enhanced memory, improved logical and analytical thinking, superior concentration — typically without citation, or with vague references to unspecified "research" and "studies."

This pattern is not unique to Sanskrit. A structurally similar debate has played out for decades around Latin instruction in Europe and North America, where claims of general cognitive and academic benefit have long circulated in curricular advocacy, prompting a substantial empirical literature testing those claims directly, including large, well-controlled recent studies (Hauspie et al., 2024). Because Sanskrit and Latin occupy comparable positions as prestige classical languages taught for reasons that combine cultural transmission with claimed cognitive benefit, the Latin-transfer literature offers a methodologically instructive point of comparison for evaluating Sanskrit's case, even though the two languages differ in their relationship to the vernaculars students already speak — a difference this paper treats as analytically central rather than incidental.

3. Review of Literature

Four bodies of literature bear on this question. First, the foundational literature on bilingualism and metalinguistic awareness, associated especially with Bialystok, establishes that learning an additional language is reliably associated

with gains in metalinguistic awareness — the explicit, reflective understanding of language's formal properties, including morphological, syntactic, and phonological structure (Bialystok, 1988, 2001). This literature is specific about what is gained: awareness of linguistic structure, not general intelligence or unrelated cognitive faculties, and it is this specific, measurable construct, rather than vaguer notions of "brain development," that provides the most defensible anchor for any claim about a second or classical language's cognitive value.

Second, Cummins's (1979) linguistic interdependence hypothesis proposes that literacy and academic language skills developed in one language transfer to a second language via a common underlying proficiency, provided the learner has reached an adequate threshold of competence in the first language. This hypothesis has direct relevance to Sanskrit's position in the Indian curriculum: because Sanskrit shares substantial vocabulary, morphology, and syntax with the Indo-Aryan languages that constitute most Indian schoolchildren's first or home languages, the interdependence hypothesis predicts a plausible transfer pathway specific to that linguistic relationship, rather than a generic benefit available from studying any additional language.

Third, the classical-language transfer literature, developed primarily around Latin, offers the most directly comparable empirical test case. A large-scale, well-controlled cross-sectional study by Hauspie, Duyck, Schelfhout, Vereeck, Janse, and Szmalec (2024) found that first-year Latin students already outperformed their non-Latin peers on intelligence, native-language competence, and metalinguistic awareness before their Latin instruction had meaningfully begun, a pattern the authors attribute to preselection — the tendency of academically stronger students to choose to study Latin — rather than to a causal effect of Latin study itself. Across the years of secondary schooling studied, the Latin-student advantage did not grow in most domains and in some cases narrowed; the only variable showing a pattern consistent with a genuine, if modest, transfer effect was vocabulary. This finding is consistent with the broader cognitive-transfer literature, in which large meta-analyses have repeatedly found that domain-general "far transfer" effects from specific training activities are small to negligible once methodologically rigorous designs, including active control groups, are used (Sala et al., 2019).

Fourth, a small but directly relevant literature addresses Sanskrit specifically. Mishra (2014) reviews a set of empirical studies comparing children educated in traditional Sanskrit schools with those in formal Western-style schooling in India, examining learning and memory, psychological differentiation, spatial language and encoding, and metacognition. This body of work, conducted by a cross-cultural developmental psychologist over several decades, represents the most direct empirical engagement with Sanskrit schooling's cognitive correlates available in the peer-reviewed literature, though, as discussed further below, it compares schooling systems rather than isolating Sanskrit-language study as a variable, and it does not report the kind of large-sample, preselection-controlled design that the Latin literature has more recently achieved.

A fifth, adjacent body of work concerns the relationship between orthographic transparency and phonological awareness in reading acquisition. Research on Indic akshara-based scripts, including Nag's (2007) study of early

reading acquisition in Kannada, documents how the transparency and structure of Brahmic scripts shape the pace and pattern of phonological and orthographic awareness development, distinct from the alphabetic scripts on which most reading research has historically been based. Because popular claims about Sanskrit frequently invoke the transparency of its phonetic representation as a cognitive advantage, this literature is relevant for assessing whether that specific claim is a property of the Sanskrit language or, more precisely, of the Devanagari and cognate Brahmic scripts it shares with Hindi and several other modern Indian languages.

4. Research Gap

Three gaps follow. First, the popular and policy-adjacent literature promoting Sanskrit's cognitive benefits under NEP 2020 makes claims of a generality and strength that the comparable, more rigorously tested case of Latin does not support, without engaging that comparative literature at all. Second, no study identified in this review applies a design comparable to Hauspie et al.'s (2024) large-scale, preselection-controlled approach to Sanskrit specifically; the existing Sanskrit-schooling literature, represented by Mishra (2014), is valuable but methodologically earlier in its development, comparing school systems rather than isolating language study as a controlled variable. Third, the specific and defensible transfer pathway implied by the interdependence hypothesis — transfer via lexical and morphological relatedness to modern Indo-Aryan languages — has not been distinguished, in either the advocacy literature or the available research, from the far weaker and less supported claim of general cognitive enhancement, leaving schools and policymakers without a clear basis for distinguishing what Sanskrit study can plausibly deliver from what it cannot.

5. Research Questions and Objectives

The paper addresses four questions. First, what does the general bilingualism and metalinguistic-awareness literature predict about the linguistic benefits of studying an additional language, and does it support claims of general, domain-independent cognitive enhancement? Second, what does the directly comparable Latin-transfer literature suggest about the risk of preselection confounding claims of classical-language benefit, and does an equivalent risk apply to the Sanskrit literature? Third, what does the existing Sanskrit-specific empirical literature actually show, and how does its evidentiary strength compare to the claims made in its name in popular and policy discourse? Fourth, what would an evidence-appropriate account of Sanskrit's pedagogical value look like, and what does it imply for how NEP 2020's Sanskrit option should be implemented and evaluated?

6. Theoretical and Conceptual Framework

This paper distinguishes three claims that are frequently conflated in popular discourse about classical-language study. The first is a near-transfer claim: that studying a language improves specific, structurally related skills in another language, such as vocabulary recognition or morphological awareness, particularly where the two languages are

historically or structurally related. The second is a far-transfer claim: that studying a language improves general cognitive faculties — intelligence, memory, logical reasoning — that are not specific to language processing and would be expected to generalize across unrelated academic domains. The third is a preselection artifact: an apparent advantage among students of a given subject that reflects who chooses to study it rather than any effect of studying it.

The framework developed here treats Cummins's (1979) interdependence hypothesis as the theoretical anchor for evaluating near-transfer claims specific to Sanskrit's relationship with Indo-Aryan vernaculars, treats the cognitive-training transfer literature (Sala et al., 2019) as the relevant benchmark for evaluating far-transfer claims, and treats Hauspie et al.'s (2024) preselection analysis as the methodological template for distinguishing a genuine transfer effect from a selection artifact. Mishra's (2014) body of work and Nag's (2007) script-specific research are read against this framework rather than as free-standing endorsements of Sanskrit's value, in order to establish precisely which of the three claims — near transfer, far transfer, or preselection — each finding actually supports.

7. Methodology

This is a conceptual and critical-synthesis paper; it reports no primary data collection. Its method is a targeted, comparative literature synthesis: peer-reviewed research on bilingualism, metalinguistic awareness, classical-language transfer, and Indic orthography was identified and read against the specific claims found in Indian popular and policy-adjacent literature about Sanskrit's cognitive benefits, in order to test which of those claims the research literature can and cannot support. Because no large-sample, preselection-controlled study of Sanskrit instruction comparable to the recent Latin literature currently exists, this paper's conclusions about Sanskrit specifically are necessarily more provisional than its conclusions about the general transfer literature, and this asymmetry is treated as a finding in its own right rather than a limitation to be minimized.

Sources were prioritized by methodological strength: large-sample controlled studies and meta-analyses were weighted more heavily than smaller or uncontrolled studies, and peer-reviewed sources were weighted more heavily than the popular and marketing-oriented material that was consulted specifically to characterize the claims under examination, and is identified as such throughout.

8. Analysis and Findings

8.1 What the general literature supports. The bilingualism literature provides strong support for a near-transfer claim: additional-language study is reliably associated with gains in metalinguistic awareness, understood specifically as explicit awareness of morphological, syntactic, and phonological structure (Bialystok, 1988, 2001). This is a real and well-documented benefit, but it is also a modest and specific one; it is not evidence for the broader claims of enhanced general intelligence, memory, or logical reasoning that dominate the popular Sanskrit literature, which typically cites no comparable construct or measurement at all.

8.2 The interdependence pathway. Sanskrit's position in the Indian multilingual classroom differs structurally from Latin's position in a European classroom in one important respect: a large proportion of Indian schoolchildren already speak an Indo-Aryan language that shares substantial vocabulary and morphological structure with Sanskrit. Under Cummins's (1979) interdependence hypothesis, this relatedness predicts a specific, plausible near-transfer pathway — Sanskrit study reinforcing and extending morphological and lexical awareness already present in the student's home language, particularly for register-elevated or Sanskritized vocabulary common in formal Hindi and other Indo-Aryan languages. This is a genuine and defensible claim, but it is also a narrower one than the general "builds the brain" framing common in school marketing, and it does not straightforwardly extend to Sanskrit study for students whose home languages are Dravidian or otherwise unrelated, where the same transfer pathway would not be predicted to operate in the same way.

8.3 The preselection problem. The Latin-transfer literature offers a direct methodological warning that applies with equal force to Sanskrit. Hauspie et al. (2024) found that Latin students already outperformed their peers on intelligence and metalinguistic measures before Latin instruction had had time to exert an effect, and that most of this gap did not widen over subsequent years of study — evidence that the population choosing to study Latin, rather than the study of Latin itself, substantially explains the observed advantage. Indian schools offering Sanskrit, particularly as an elective within the three-language formula rather than a compulsory subject, are structurally exposed to the identical confound: students who elect or are steered toward Sanskrit are plausibly not a random sample of the student population, and the uncontrolled, comparison-group-free claims found throughout the popular Sanskrit literature provide no way of ruling out this explanation for whatever advantages Sanskrit students display.

8.4 The phonetic-transparency claim. A specific and recurring claim in the popular literature holds that Sanskrit's phonetic precision — the close correspondence between its script and its pronunciation — confers cognitive advantages related to attention, articulation, and auditory discrimination. The orthographic-transparency literature supports a version of this claim, but a narrower and differently located one: transparent orthographies are associated with distinct patterns of phonological awareness development in reading acquisition, and this has been specifically documented for Indic akshara-based scripts (Nag, 2007). This is a property of the Devanagari and cognate Brahmic writing systems, however, not of Sanskrit as a classical language; Hindi, Marathi, Nepali, and other modern languages written in the same or structurally similar scripts would be expected to share this property to a comparable degree. The popular literature's implicit suggestion that phonetic transparency is a distinguishing feature of Sanskrit specifically therefore appears to conflate a script-level property with a language-level one.

9. Discussion

Taken together, these findings support a genuine but circumscribed case for Sanskrit's pedagogical value, considerably narrower than the case typically advanced in popular and policy-adjacent literature. The defensible claim is a near-transfer one: for students whose home language is Indo-Aryan, Sanskrit study plausibly reinforces morphological and

lexical awareness through the mechanism the interdependence hypothesis describes, and the phonological-awareness benefits associated with transparent akshara-based scripts are real but belong to the writing system rather than to Sanskrit uniquely. The broader claim of domain-general cognitive enhancement — improved memory, logical thinking, and academic performance across unrelated subjects — is not supported by the general cognitive-transfer literature, which finds far-transfer effects to be small or negligible under rigorous designs (Sala et al., 2019), and the single closely comparable case, Latin, shows that apparent advantages of this kind are substantially attributable to which students choose the subject rather than to studying it (Hauspie et al., 2024).

This does not mean the far-transfer claim is false; it means it is currently untested for Sanskrit in a way that would allow it to be distinguished from a preselection artifact, and the burden of that untested status should fall on the claim, not on the skeptic. Mishra's (2014) body of research is a valuable starting point precisely because it compares schooling systems using real Indian populations, but it does not resolve the preselection question in the way the recent Latin literature does, and it should be read as motivating further, more tightly controlled research rather than as settling the matter. This is precisely the kind of gap that a rigorously designed empirical study — comparing matched groups of Sanskrit and non-Sanskrit students on specific, pre-registered linguistic and cognitive measures — could begin to close, and its absence in the current Indian research landscape is itself a notable finding of this review.

A further point of caution concerns equity. If Sanskrit's genuine benefit operates chiefly through relatedness to Indo-Aryan home languages, then framing it as a universal cognitive good, rather than as a language-specific and linguistically contingent benefit, risks obscuring the fact that its pedagogical value is not evenly distributed across India's linguistically diverse student population, an implication the promotional literature reviewed here does not acknowledge.

10. Educational Implications

Several implications follow for schools and policymakers implementing NEP 2020's Sanskrit option. First, schools should describe Sanskrit's linguistic benefits in the specific terms the evidence supports — vocabulary and morphological awareness, particularly for speakers of Indo-Aryan home languages, and script-related phonological awareness shared with Hindi and cognate languages — rather than in the undifferentiated language of general cognitive enhancement that currently dominates parent-facing communication. Second, curriculum design should make the interdependence pathway explicit and pedagogically active, deliberately drawing students' attention to cognate vocabulary and shared morphology between Sanskrit and their home language, since this is the mechanism through which the best-supported transfer effect is theorized to operate, rather than assuming the benefit will accrue passively. Third, schools and state education departments introducing or expanding Sanskrit instruction have an opportunity, largely unexploited in the current literature, to design outcome evaluations with matched or comparison groups from the outset, which would allow India's Sanskrit-instruction data to do what the European Latin-instruction data has only recently begun to do: distinguish a real transfer effect from a preselection artifact. Fourth, given the

equity concern raised above, evaluation and communication should be disaggregated by students' home-language background rather than treated as uniform across India's linguistically diverse classrooms.

11. Limitations

This paper is a conceptual and critical-synthesis review rather than an empirical study; it reports no new data on Sanskrit-specific transfer effects, and its central methodological argument — that Sanskrit's claimed benefits require preselection-controlled testing — is a call for such research rather than a substitute for it. Its comparative use of the Latin-transfer literature assumes a degree of structural similarity between Latin's and Sanskrit's position as prestige classical languages that, while defensible, is not identical; the interdependence pathway specific to Sanskrit's relationship with Indo-Aryan languages has no precise European analogue, and this asymmetry limits how far the comparison can be pushed. The Sanskrit-specific empirical literature reviewed here is thin, and Mishra's (2014) work, though the most directly relevant available, was not designed to isolate language study from the broader schooling-system differences it examines. Finally, this review does not systematically survey non-English-language Sanskrit-pedagogy scholarship, which may contain additional relevant empirical work not captured by the search strategy used here.

12. Conclusion

The evidence available does not support the domain-general cognitive claims that dominate popular advocacy for Sanskrit instruction in India, but it does support a real, specific, and pedagogically actionable claim: that Sanskrit study plausibly strengthens morphological and lexical awareness for speakers of related Indo-Aryan languages, and that the transparency of the Devanagari and cognate Brahmic scripts supports phonological awareness in ways documented for Indic reading acquisition generally. Realizing Sanskrit's value under NEP 2020 does not require inflating these findings into a general theory of cognitive enhancement; it requires naming the specific mechanism correctly, teaching to it deliberately, and building the kind of controlled, comparison-group research into Sanskrit instruction that the Latin-transfer literature took decades longer than it should have to demand of itself.

References

Bialystok, E. (1988). Levels of bilingualism and levels of linguistic awareness. Developmental Psychology, 24(4), 560–567.

Bialystok, E. (2001). Bilingualism in development: Language, literacy, and cognition. Cambridge University Press.

Cummins, J. (1979). Linguistic interdependence and the educational development of bilingual children. Review of Educational Research, 49(2), 222–251.

Hauspie, C., Duyck, W., Schelfhout, S., Vereeck, A., Janse, M., & Szmalec, A. (2024). Is studying Latin associated with (non-)linguistic cognitive transfer? A large-scale cross-sectional study. Contemporary Educational Psychology, 79, 102325.

Ministry of Education, Government of India. (2020). National Education Policy 2020. New Delhi: Government of India.

Mishra, R. C. (2014). Effects of Sanskrit schooling on cognitive and social processes. Psychology and Developing Societies, 26(1), 1–27.

Nag, S. (2007). Early reading in Kannada: The pace of acquisition of orthographic knowledge and phonemic awareness. Journal of Research in Reading, 30(1), 7–22.

Sala, G., Aksayli, N. D., Tatlidil, K. S., Tatsumi, T., Gondo, Y., & Gobet, F. (2019). Near and far transfer in cognitive training: A second-order meta-analysis. Collabra: Psychology, 5(1), 18.