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Reading as Progressive Skill Acquisition: A Developmental Educational Framework Integrating Phonological Learning, Procedural Fluency, and Motivated Automaticity

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ABSTRACT

Background: Early reading acquisition is among the most educationally consequential achievements of childhood. Yet prevailing theoretical frameworks governing instructional design remain insufficiently grounded in developmental learning theory. Most existing models frame reading development as a cognitive processing architecture, attending to how reading operations are organised rather than to how reading skill is progressively acquired through instruction, practice, and motivation.

Objective: This paper presents the Skill Acquisition Framework for Early Reading (SAFER), a four-stage developmental model that reconceptualises the progression from phonological awareness to reading automaticity through the theoretical lens of skill acquisition, scaffolded learning, and motivated self-regulation rather than neurological processing architecture.

Method: A theoretically integrative narrative review synthesised evidence from developmental educational psychology, cognitive learning theory, reading science, cross-linguistic literacy study, and instructional intervention studies published between 2010 and 2025. The review was organised around four interlocking theoretical bodies: skill acquisition theory, phonological learning and alphabetic instruction, procedural fluency and orthographic learning, and motivational self-regulation in reading development.

Results: Stage IV involves the automaticity of reading, supported by self-regulated and motivated print engagement, resulting in the accumulation of instances. The contribution of reading motivation and self-regulatory capacity in the transition from Stage III to Stage IV is placed as an architectural moderator, which is not considered in the purely cognitive processing approaches.

Conclusions: SAFER raises eight empirically stated, testable predictions related to the instructional specificity, effects of ZPD-based scaffolding, motivational moderation, cross-script transfer in Indian multilingual environments, and the role of teachers' pedagogical knowledge in reading results. It provides a theoretically viable and pedagogically relevant framework for reading development and offers concrete guidance for assessment tasks, integrated literacy planning and instruction, reading intervention, and teacher preparation, especially in India's multilingual service provision context.

Keywords: *acquisition of reading abilities, instrumentalities of reading, reading automaticity, self-regulated learning, reading motivation, deliberate practice, instructional scaffolding, reading automaticity, Zones of Proximal Development, reading fluency, writing in Indian languages, beginning reading*

1. Introduction

For over a hundred years, educational scholars, developmental psychologists and classroom teachers have struggled to understand how children learn to read. But moving from theory to design is still a persistent issue. Important strides have been made in cognitive predictors of early reading competence, particularly the abilities of phonological awareness (PA) and rapid automatized naming (RAN), and in populations of these cognitive measures and early reading outcomes.A great deal of development has occurred in the identification of the cognitive measures of reading early competence and in mapping the empirical relationships between these cognitive measures, reading behavior and reading outcomes, most notably in the areas of phonological awareness (PA) and rapid automatized naming (RAN). However, the prevailing theories by which these results are explained typically view complex reading operations as single, isolated 'architectures' of cognitive processing—specifying ways in which operations are structured in the mind—as opposed to the ways in which reading ability is developed through systematic instruction, practice and motivated interaction with texts. This focus on processing organization instead of learning process has led to a conception mismatch between reading science and educational psychology, which has menaced the usefulness of prevailing theory explanations in the context of application to the actual learning process.

A model based on educational psychology asks other, more (hopefully) teachable questions. It does not define the cognitive architecture in which the acquisition of phonological, orthographic and linguistic information can be connected, but rather asks questions: How shall reading skill be formed at qualitatively different levels of acquisition? What are suitable types of scaffolded instruction for each level? When does the learner need some assistance, and when is enough assistance enough? More importantly, do motivational orientations and whether or not they use certain self-regulatory strategies matter in whether or not a child who has learned to decode successfully develops into a fluent, independent reader? Their answers fall on the quintessentially educational psychological dimensions and have direct application, immediate relevance, for classroom instruction, teacher preparation and reading intervention design.

To fill this gap, the present paper presents the Skill Acquisition Framework for Early Reading (SAFER), a theoretically informed developmental framework that proposes a re-conceptualisation of early reading development by integrating the skills acquisition, ZPD (Vygotsky), instance-based theory of automatisation (Logan) and reading motivation and self-regulated learning literatures. It does not deny the validity of the empirical results of cognitive reading science but takes these results and turns them into a referential learning-theory account that is more directly and usefully relevant to the questions that reading experts and teachers most urgently need to be addressed.

The paper then continues in this manner. The theoretical accounts contained in section 2 bring an educational learning-theory perspective instead of a processing-architecture perspective to bear on skill acquisition theory, phonological awareness, Rapid Automatized Naming, reading fluency, reading automaticity, and reading motivation. Section 3 introduces the SAFER framework, the five SAFER design principles, the four-phase SAFER architecture, the SAFER scaffolding of instruction, the reconceptualization of the DDH as a logic of differentiated instruction, and the cross-linguistic applicability of SAFER. The eight findings of the empirical predictions are formally presented in section 4. Section 5 deals with methodological implications, and Sections 6 and 7 summarize and discuss the findings, making conclusions.

2. Theoretical Background

2.1 An understanding of Skill Acquisition theory as the Organising Framework.

The theoretical foundation of the SAFER framework comes from a group of theories regarding skill acquisition and the development of novices' performance that distinguish qualitatively different phases in the acquisition of novices' skill. A cognitive phase where learning makes use of declarative knowledge of the motor skill and error rate remains high, but the skill is learned consciously and with effort; an associative phase in which performance becomes increasingly efficient in which errors decrease, and the motor skill starts to compile into procedures; and an autonomous phase in which skills are performed at a low level of conscious awareness, so that higher order processes may take place. The progression of declarative knowledge to procedural compilation to autonomous performance is linear and seems directly and productively to align with the sequence of learning stages in early reading.

The progression in Anderson's ACT-R (Adaptive Control of Thought - Rational) cognitive architecture is formally represented by a theoretically precise distinction between declarative knowledge (explicit knowledge, which can be accessed when awareness is not assumed; explicit knowledge of facts and rules) and procedural knowledge (condition-action production knowledge that must be checked to execute in an automatic and largely non-awareness manner). Phonological awareness and grapheme-phoneme correspondence knowledge are the two main DKKs for reading. These are the directly teachable facts about the structure of language and how it is written, that underlie reading in the alphabetic mode. This is the process of proceduralization that is the very process skill acquisition theory predicts, or that good reading instruction needs to encourage and foster: getting the knowledge filed in a way that is rapid and efficient, so it runs without deliberate attention.

Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD) provides the socio-developmental complement to these individually focused learning-theory accounts. The ZPD is defined as the distance between what a learner can accomplish independently and what they can accomplish with expert guidance or peer collaboration. Applied to reading instruction, the ZPD framework implies that the most developmentally productive instructional zone is neither the zone of current independent

competence (where practice consolidates already-mastered skills), nor the zone of frustration (where material is too challenging to process meaningfully), but the intermediate zone, where guided support enables performance that the learner cannot yet achieve alone. This principle has specific implications for the design of reading instruction at each stage of the SAFER framework, as detailed in Section 3.

2.2 Phonological Awareness: Declarative Knowledge at the Foundation

Phonological awareness, the metalinguistic capacity to recognise, attend to, and deliberately manipulate the sound structure of spoken language, is the most extensively studied predictor of early reading acquisition across languages and orthographies (Melby-Lervåg, Lyster, & Hulme, 2012; Hulme & Snowling, 2021). In the SAFER framework, the emphasis for phonological awareness does not lie at the level of how the brain processes sounds, but rather as a discrete and teachable declarative understanding of the sound structure of language, a knowledge that, importantly, is affected by systematic instruction (Galuschka et al., 2020; Suggate, 2016).

This distinction is important as it separates out from the others the essential phonological awareness that is required to understand spoken language, which is found in virtually all children before they start to learn to read, from the explicit and analytic phonological knowledge which is necessary for alphabetic reading. Transitioning from implicit phonological sensitivity to the explicit and conscious awareness of the phoneme level is closely the same transition we want to make when we teach phonological awareness, and it is as mediated by the pedagogue as phonological awareness is. Oral environments that do not feature sub-word sound play usually fail to provide children with monitoring of phonemes at their disposal, and consequently do not promote these skills on a spontaneous basis (Castles, Rastle, & Nation, 2018). The teachability is at the very heart of the educational psychology truth about phonological awareness - even more educationally relevant than it's role as a cognition predictor.

Across the study of cross-linguistic study, we have gained insights into systematic variation in the developmental path of phonological awareness and the associations between phonological awareness and reading outcomes with regard to the orthographic system that children are learning (Caravolas et al., 2019; Landerl et al., 2019). In consistent orthographies, grapheme-phoneme correspondence is regular and transparent, and phonological awareness is a good predictor of reading accuracy in the beginning of instruction, when children are able to decode almost perfectly before the shift towards fluency. In less consistent orthographies like English, phonological awareness continues to be a significant predictor of accuracy and fluency at a longer window into the developmental process. As the orthographic encoding unit of Indian language is the consonant-vowel akshara (unit) as opposed to the individual phoneme, the unit of phonological awareness in Indian language classrooms could well be the akshara or syllable, rather than the phoneme (Vaid & Gupta, 2002; Nag, Snowling, Quinlan, & Hulme, 2022).

2.3 Reading Fluency: Within the Zone of Proximal Development

The observable function or product of reading, also known as reading fluency, refers to being able to read connected texts with adequate speed, accuracy, and expression for comprehension purposes (National Reading Panel, 2000; Rasinski, Rupley, Paige, & Nichols, 2016). Reading fluency is not just an instructional tool; it's a developmental zone within SAFER. It's the area that needs the most scaffolding in terms of instruction support and that's the area where the Zone of Proximal Development is the most relevant.

The ZPD analysis of reading fluency development implies that fluency instruction is most effective when it operates in the instructional reading zone, material that is above the child's independent reading level but within reach with guided support. Guided oral reading, paired reading, repeated reading with corrective feedback, and echo reading are all instructional practices that operationalise ZPD principles in the fluency domain. They provide expert scaffolding that enables performance slightly beyond the child's current independent capability, gradually withdrawing that scaffolding as the child's procedural fluency increases (Kuhn & Stahl, 2021; Rasinski et al., 2016). The SAFER framework predicts that the developmental gains from these ZPD-consistent practices will be greater than gains from independent silent reading practice at comparable text levels, because the scaffolded context enables the child to process text at a procedural fluency level they cannot yet independently sustain.

The prosodic dimension of reading fluency - the appropriate expression, phrasing, and intonation that mark the fluent reader's construction of meaning from text - is theoretically significant within the SAFER framework because, it is precisely the dimension of fluency that cannot be achieved through phonological decoding competence alone. Prosodic fluency indexes the child's real-time syntactic and semantic processing during reading, and its development requires exposure to and practice with connected text in meaningful communicative contexts that go beyond decoding drill. Kuhn and Stahl (2021) have argued that prosodic fluency is the most sensitive indicator of a child's transitional reading development, the indicator that best captures whether a child is reading for meaning, not merely for accuracy, making it a particularly valuable target for formative assessment within the SAFER framework's Stage III instructional phase.

2.4 Reading Automaticity: Instance Accumulation and Motivated Print Engagement

Reading automaticity, the processing state in which word recognition occurs rapidly, effortlessly, and without conscious attentional allocation, freeing working memory resources for comprehension (LaBerge & Samuels, 1974; Logan, 1988), represents the apex developmental achievement of early reading instruction. Within the SAFER framework, the development of reading automaticity is understood as a function of instance accumulation. Interactions with words in print lead to an episodic trace in LTM, with the

more information added, the more fluent and effortless the subsequent recognition. The instructional implication is that beyond the Stage III procedural compilation level for automaticity, volume, diversity, and quality of a child's print exposure largely determine the development of automaticity.

The impact of print exposure is further enhanced by Ericsson's idea of deliberate practice, which holds that not all print exposure will be equal in terms of increasing instance density and instance automaticity. Deliberate reading practice with the right amount of difficulty, with clear learning objectives, with immediate corrective feedback and with sustained interest in the text leads to a significant increase in automaticity gains compared to equal amounts of unreflective reading (Ericsson, Krampe, & Tesch-Römer, 1993). This finding is very important for the instruction of reading, the aspect which is often ignored. Independent reading time, when not intentionally adaptable, with student monitoring, and feedback on accuracy and efficiency of processing, can build up inaccuracies or inefficiencies in processing which actually slow down rather than speed up automaticity. The intentional practice rationale underlies the instructional recommendations given in Stage IV of SAFER.

The instance-based automaticity account is compatible with the phase theory of sight word learning developed by Ehri (2020). Ehri documents the process that children go through as they become more successful in their representations of specific words, which he terms pre-alphabetic, partial alphabetic, full alphabetic, and consolidated alphabetic. The latter is the stage of alphabetically represented words being fully specified and quickly retrieved. The change to the consolidated phase occurs when a reader achieves full (SAFER) automaticity for that word, which is a word-specific achievement that needs to be acquired throughout the entire reading vocabulary. The rate of this accumulation depends on the efficiency of the procedural compilation mechanisms which are set up in Stage III together with the density of instances.

2.5 Good reading motivation and self-regulation are developmental moderators for the acquisition of reading skills.

The SAFER framework provides a formally explicit moderation of the Stage III to Stage IV transition by reading motivation and self-regulated learning via unique architectural structures, which largely distinguishes it from current cognitive processing theories of reading development. In processing-architecture frameworks, instruction and motivation are considered background conditions to develop reading skill, while in the SAFER framework, motivational orientation and self-regulatory capacity are considered theoretically significant factors that will directly moderate the process from a reading supported by processing/architecture to reading that is fully autonomous and self-sustaining.

The theoretical basis for this incorporation is drawn from Guthrie and Wigfield's (2000) Concept-Oriented Reading Instruction (CORI) study programme, which has consistently demonstrated that reading motivation (conceptualised as the combination of intrinsic reading interest, reading self-efficacy, and reading purpose), significantly predicts the volume of children's voluntary reading engagement, independently of their decoding competence. Since voluntary reading volume is the primary driver of instance accumulation in post-instructional reading development, reading motivation functions as a gating variable for automaticity. Children who have achieved adequate Stage III procedural fluency but who lack reading motivation will accumulate instances at a significantly slower rate than motivationally engaged children with comparable procedural fluency. The SAFER framework formalises this mechanism as the Motivational Moderation of Automaticity Development (MMAD), its most theoretically novel architectural claim.

3. The Skill Acquisition Framework for Early Reading (SAFER)

3.1 Design Principles

The SAFER framework has five design principles based on its epistemological views and its pedagogical application in education.

1. The 1st Rule, the Principle of Learning-Theoretical Grounding, is that every architectural claim contained in the framework must be "derived from a learning theory other than neurological processing accounts" (2nd Rule) - specifically, from learning theory, in this case, the notion of skill acquisition theory, ZPD, instance based learning and deliberate practice. This means that the implications for the framework are not only in terms of cognitive mechanisms, but also of learning conditions and instructional actions.

2) According to the Principle of Developmental Staging, the four different developmental stages of the framework are qualitatively different types of reading competence, defined by varying levels of conscious deliberation and automatized processing. Transitions are not imposed solely by biological maturation, but rather by learning, through the accumulation of successful learning experiences and reading practice instances.

3) The Principle of Instructional Scaffolding Specificity holds that each developmental stage carries specific implications for the type and intensity of instructional scaffolding that is most effective. Instruction that is appropriate for Stage II - highly explicit, systematic phonics teaching with direct feedback - is neither necessary nor sufficient for Stage III, where scaffolded oral reading practice and word-level fluency training are most productive. This principle challenges one-size-fits-all instructional approaches.

4) The Principle of Motivational Integration holds that affective and motivational variables - reading motivation, self-efficacy, and self-regulatory strategy use - are not peripheral to reading development but are integral moderators of the Stage III to Stage IV transition, whose influence increases as children approach autonomous reading competence. Instructional design must therefore attend to motivational architecture alongside skill-level sequencing.

3.2 The Four-Stage Developmental Architecture

Table 1 outlines the four stages of the SAFER framework including the competencies of each stage, the learning mechanism for each stage, the main instructional entry point, what type of scaffolding is suitable for each stage, and a developmental marker that can be observed.

Table 1

The Four-Stage Developmental Architecture of the SAFER Framework

Stage	Defining Competency	Learning Mechanism	Primary Instructional Entry	Scaffolding Type	Developmental Marker
Stage I	Oral language; implicit phonological sensitivity; narrative comprehension; vocabulary breadth	Incidental exposure; oral language interaction; shared reading	Rich oral language environment; phonological play; read-alouds	Adult-mediated language enrichment	Can segment words into syllables; enjoys rhyme and word play; follows multi-step oral instructions
Stage II	Explicit phoneme awareness; grapheme-phoneme correspondences; phonological decoding of novel words	Declarative knowledge acquisition; explicit alphabetic mapping; conscious rule application	Systematic phonics instruction; phoneme awareness training; blending and segmentation drill	Highly explicit, corrective, systematic instruction	Can decode simple CVC words; reads decodable texts with effort; makes phonologically plausible spelling errors
Stage III	Procedural fluency; orthographic pattern learning; sight-word consolidation; RAN-indexed retrieval efficiency	Procedural compilation; instance accumulation; deliberate fluency practice within ZPD	Guided oral reading; repeated reading with feedback; fluency-building word study; decodable then levelled texts	ZPD-calibrated guided practice; scaffolded then faded support	Reads familiar words automatically; decodes novel words with decreasing effort; prosody emerging in guided reading
Stage IV	Reading automaticity; self-regulated reading; prosodic fluency; reading for comprehension and pleasure	Instance-based retrieval; motivated voluntary reading; self-regulatory strategy use; deliberate reading practice	Independent reading at appropriate levels; comprehension strategy instruction; book selection support; metacognitive coaching	Motivational scaffolding; strategy coaching; self-regulation support	Reads grade-level text fluently with appropriate prosody; self-monitors comprehension; chooses to read voluntarily

Note. CVC = consonant-vowel-consonant; ZPD = Zone of Proximal Development; RAN = Rapid Automatized Naming. Stages are not strictly age-bound; developmental progression depends on the quality of instructional experience and learning conditions.

3.3 Instructional Scaffolding Across the Four Stages

A distinctive contribution of the SAFER framework is its specification of stage-appropriate instructional scaffolding rather than the identification of deficit-level cognitive targets alone. The framework distinguishes between scaffolding that is constitutive of learning at each stage (without which the stage's characteristic learning mechanism cannot operate) and scaffolding that is supplementary (providing additional support for children whose progression is slower than typical).

At Stage I, the constitutive instructional scaffolding is rich oral language interaction - adult conversations that extend children's vocabulary, shared storybook reading that builds narrative comprehension and exposes children to the language of books, and phonological play activities such as rhyming games and clapping games that activate implicit phonological sensitivity. This scaffolding is primarily socio-cultural in character. It operates through Vygotsky's broader social mediation of cognitive development, and its deficiency is reflected in the oral vocabulary and phonological sensitivity differences that have been documented between children from language-rich and language-restricted home literacy environments (Lonigan & Shanahan, 2009).

The scaffolding of the constitutive elements at the Stage II level consists of systematic and explicit phonics instruction: "direct" teaching of GPCs and the printing of the symbols for each of these in a specific order; training in phoneme awareness, in which the knowledge of phonemic units becomes conscious; and blending and segmenting, which "brings" phonemic knowledge into the print world. The evidence base for systematic phonics instruction is very extensive (Castles et al., 2018; Galuschka et al., 2020) and is entirely consistent with the predictions made in the SAFER framework. The four conditions that best facilitate the learning of declarative knowledge – declarative presentation, worked examples, corrective feedback, and spacing – are precisely those of systematic phonics instruction.

Adding to Stage III is the qualitative change in the type of scaffolding in the form of direct knowledge transmission to a more ZPD calibrated type of practise. The stage III learner already has acquired the declarative knowledge base, which is the knowledge he already has at stage II. A need is not for more explicit teaching of phoneme-grapheme correspondences but for more scaffolding and for opportunities to engage in procedural compilation over a sufficient number and diverse range of reading experiences. Guided oral reading in which the teacher reads along with the child while the child reads is the preferred scaffolding technique in the ZPD for Stage III because it models fluent prosodic reading, allows for immediate error correction, and allows for increasing text difficulty as needed. The different kinds of repeated reading are all helpful in computation, as are paired reading with a more capable peer, and procedures designed to support word study (explicit sorts, word ladders, or timed word recognition drills) that are designed to be encountered in a controlled, deliberate, and calibrated way appropriate to the child's ZPD.

At Stage IV, the structure in the constitution changes again, and it is now more externally based, yet internally motivated reading development. At this stage, the critical instructional moves are motivational and metacognitive rather than declarative or procedural. This includes providing access to texts that match children's interests and are appropriately calibrated to their automaticity level, building reading self-efficacy through choices and achievable challenges, explicitly teaching comprehension monitoring and repair strategies, and creating classroom and home environments that support voluntary reading engagement. The SAFER framework predicts that Stage IV outcomes will be more strongly moderated by motivational and self-regulatory variables than by any additional instructional scaffolding of the phonological-procedural kind, because the primary driver of automaticity development at Stage IV is the voluntary instance accumulation that only genuinely motivated, self-directed reading engagement produces.

3.4 The Double Deficit Hypothesis: A Skill Acquisition Reconceptualisation

Wolf and Bowers' (1999) Double Deficit Hypothesis (DDH) holds that reading disabilities arise from deficits in one or both of two independent processing systems, phonological awareness and naming speed. Within the SAFER framework, the DDH is reconceptualised not as an architectural claim about dissociated processing systems but as a diagnostic framework for identifying at which stage of the skill acquisition progression a child's development has been disrupted - and consequently, what instructional intervention is indicated.

A child with a selective phonological awareness deficit - corresponding in SAFER terms to a Stage II impairment - has failed to acquire adequate declarative phonological knowledge about the sound structure of language, either because of limited phonological sensitivity at Stage I or because systematic Stage II instruction has been insufficient. The appropriate instructional response is targeted, intensive Stage II intervention; systematic phonological awareness training combined with grapheme-phoneme correspondence instruction, calibrated to bring the child's declarative knowledge base to the threshold needed for Stage III procedural compilation to proceed. The SAFER framework makes a specific prediction here that the DDH does not - Stage II intervention will be most effective when it explicitly supports the transition to Stage III by including structured, supported decoding practice rather than limiting itself to phonological awareness training in isolation.

A child with a double deficit - Stage II and Stage III impairments - requires sequenced intervention that begins at Stage II (because adequate declarative knowledge is a prerequisite for Stage III procedural compilation to occur) but must subsequently deliver intensive Stage III fluency-building intervention once Stage II thresholds are achieved. The SAFER framework's re-conceptualisation of the DDH as a staging diagnostic thus generates more specific, more sequenced, and more instructionally tractable intervention recommendations than the DDH's original formulation.

3.5 Cross-Linguistic and Indian Educational Context

The SAFER framework's Principle of Cross-Linguistic Adaptability acknowledges that while the four-stage architecture is generalisable, the specific cognitive operations and instructional practices appropriate to each stage will vary with orthographic characteristics. This variability is particularly significant for Indian educational contexts, where early literacy instruction occurs across a typologically diverse set of scripts and language structures.

Devanagari and related Brahmic abugida scripts present a distinctive orthographic profile that has implications for the SAFER framework at multiple stages. Unlike alphabetic scripts, where the primary orthographic unit is the individual phoneme-grapheme correspondence, Brahmic scripts encode language at the level of the consonant-vowel syllable (akshara), with vowel diacritics attached to base consonant characters. This means that the declarative knowledge of Stage II in a Devanagari reading context includes akshara recognition and the akshara-phoneme correspondence system rather than individual grapheme-phoneme correspondences, and phonological awareness instruction at Stage II should target syllable and akshara-level units rather than exclusively individual phonemes (Nag et al., 2022).

At Stage III, the orthographic regularity of most Indian scripts - which are considerably more transparent than English at the akshara level - predicts that procedural compilation should proceed more rapidly than in English, with children achieving akshara-level automaticity within a shorter instructional window. However, the larger inventory of distinct character shapes in South Indian scripts (Tamil, Telugu, Kannada, Malayalam) compared with Devanagari may moderate this prediction. The greater number of orthographic patterns to be compiled into procedural routines may extend the Stage III phase and amplify the importance of the RAN-indexed procedural fluency mechanism, since efficient serial visual processing of a larger character set places greater demands on the retrieval speed that RAN indexes.

The Indian multilingual educational context adds a further dimension of specific importance at Stage III and Stage IV. For children who are learning to read in a second or third language - as is common in India, where the medium of instruction frequently differs from the home language - the instance accumulation required for Stage IV automaticity must occur in a language and script in which the child's oral language foundation (Stage I) may be significantly weaker. ASER (2023) data consistently demonstrate that multilingual and multi-script instructional environments, without corresponding instructional support for the cross-linguistic transfer of Stage I and Stage II competencies, produce the gap between decoding ability and reading comprehension that characterises India's literacy challenge at scale.

4. Empirical Predictions

A theoretically productive framework must generate specific, falsifiable predictions that distinguish it from alternative accounts. Table 2 presents the eight formal empirical predictions of the SAFER framework, each derived from a specific architectural claim. The following section elaborates each prediction.

Table 2

Formal Empirical Predictions of the SAFER Framework

P#	Formal Prediction	SAFER Architectural Source
P1	Systematic phonics instruction targeting Stage II will produce significantly larger gains in phonological decoding accuracy than in oral reading fluency, while fluency-building instruction targeting Stage III will produce significantly larger gains in reading fluency than in phonological decoding accuracy. These specificity effects will be strongest when instruction is precisely stage-matched to the child's assessed developmental profile.	*Stage specificity of instructional scaffolding (Principle of Instructional Scaffolding Specificity)*
P2	Children at the Stage II to Stage III transition (adequate phoneme awareness; low procedural fluency) will show significantly greater reading fluency gains from guided oral reading instruction calibrated to their ZPD than from independent reading practice at the same text level, and this ZPD-scaffolding advantage will be largest for children with low baseline RAN scores.	*ZPD-based scaffolding; Stage III procedural compilation*
P3	Reading motivation (operationalised as intrinsic reading interest and reading self-efficacy) will significantly moderate the Stage III to Stage IV transition: among children with equivalent Stage III procedural fluency, higher reading motivation at the end of Grade 1 will predict significantly greater gains in reading automaticity by the	*Motivational Moderation of Automaticity Development (MMAD); Principle of Motivational Integration*

P#	Formal Prediction	SAFER Architectural Source
	end of Grade 2, independently of phonological awareness, vocabulary, and RAN.	
P4	Self-regulated reading strategy use (comprehension monitoring, repair strategy deployment, goal-directed text selection) will mediate the relationship between reading automaticity and reading comprehension in Grades 2 to 3, such that automaticity gains that are not accompanied by self-regulatory strategy development will produce proportionally smaller comprehension gains than automaticity gains embedded within self-regulatory practice.	*Stage IV: deliberate practice and self-regulated reading; Logan's instance theory*
P5	Children receiving Stage II to Stage III sequenced intervention (phonics instruction followed by ZPD-calibrated fluency-building practice) will show greater long-term gains in oral reading fluency than children receiving equivalent time in phonics-only intervention, and this advantage will be most pronounced among children with low baseline RAN scores.	*Intervention sequencing; Stage III requires dedicated fluency scaffolding beyond Stage II phonics*
P6	In Brahmic abugida script contexts (Hindi/Devanagari; Tamil; Telugu), Stage II phonological awareness instruction will produce faster gains in akshara-level decoding accuracy relative to phoneme-level accuracy compared with English alphabetic contexts, consistent with the shallower orthographic depth at the akshara unit. However, Stage III procedural compilation will require a longer instructional investment in South Indian scripts with larger character inventories than in Devanagari.	*Cross-linguistic adaptability (Principle of Cross-Linguistic Adaptability); abugida orthographic structure*
P7	In Indian multilingual classrooms where the language of instruction differs from children's home language, Stage I oral language depth in the instructional language will moderate Stage III procedural compilation rate: children with stronger oral language foundations in the instructional language will accumulate reading instances at significantly faster rates than children decoding in a weaker oral language, even after controlling for decoding accuracy.	*Stage I oral language as prerequisite for Stage III - IV instance accumulation; Indian multilingual context*
P8	Teacher knowledge of the SAFER framework's four-stage architecture, assessed through a structured pedagogical content knowledge measure, will predict the stage-appropriateness of observed instructional decisions (as rated by trained observers), which in turn will predict reading fluency outcomes in students, independently of teacher experience and instructional time.	*Principle of Instructional Scaffolding Specificity; translational educational psychology claim*

Note. ZPD = Zone of Proximal Development; RAN = Rapid Automatized Naming; MMAD = Motivational Moderation of Automaticity Development. All predictions are stated as directional and testable hypotheses with specific operationalisable comparisons.

4.1 Elaboration of Selected Predictions

Predictions P1 and P5: Instructional Specificity and Sequencing

P1 hypothesises that reading interventions will produce outcome gains that correspond to the stage of intervention that is aligned with the outcome measure. Stage II phonics instruction will yield Stage II outcome gains (decoding accuracy), and Stage III fluency instruction will yield Stage III outcome gains (oral reading fluency). A study of intervention effectiveness that provides Stage II phonics instruction and then assesses its effectiveness across oral reading fluency will systematically underestimate the effectiveness of the intervention at the intended target architectural level, but overestimate the need to teach the non-targeted architectural level.

P5 extends this claim to sequenced intervention design, predicting that children who receive Stage II instruction followed by deliberate Stage III scaffolding will outperform children who receive extended Stage II instruction alone. This prediction is partially supported by existing reading intervention study (Kuhn & Stahl, 2021; Kilpatrick, 2016) but has not been tested in designs that explicitly align intervention components to SAFER stages and use stage-appropriate outcomes at each assessment point.

Prediction P3: The Motivational Moderation of Automaticity Development

Prediction P3 represents the SAFER framework's most theoretically novel claim and the one that most clearly differentiates it from cognitive processing accounts of reading development. The prediction that reading motivation will moderate the Stage III to Stage IV transition - among children with equivalent procedural fluency - has not to the authors' knowledge been tested in a design that simultaneously controls for phonological processing, RAN, and vocabulary while measuring reading motivation as a prospective moderator of automaticity development. The theoretical mechanism is the voluntary reading engagement pathway. Motivated children who have achieved Stage III procedural fluency engage more frequently and more deliberately with print in their out-of-school time, accumulating instances at a faster rate than less motivated children with equivalent in-school instructional exposure.

This prediction has profound implications for reading intervention design. If confirmed, it implies that reading interventions aimed at building automaticity in Stage III children must address motivational conditions alongside fluency-building instruction, that providing intensive guided reading practice without simultaneously cultivating reading interest, self-efficacy, and access to motivating texts will produce suboptimal automaticity outcomes. Conversely, programmes that embed fluency-building instruction within motivationally rich reading contexts (such as Guthrie's CORI programme) would be predicted to produce superior Stage IV outcomes compared with instructionally equivalent but motivationally neutral fluency training.

Predictions P6 and P7: Cross-Linguistic and Indian Multilingual Contexts

Predictions P6 and P7 address the cross-linguistic adaptability of the SAFER framework in the Indian educational context. P6 makes a specific prediction about the orthographic depth moderation of Stage II and Stage III learning in Indian scripts that is amenable to testing in a cross-linguistic design comparing Hindi, Tamil, and English reading acquisition within the same SAFER framework. P7 addresses the oral language mediation problem in multilingual instruction, predicting that Stage I oral language depth in the instructional language will moderate Stage III instance accumulation, a prediction with direct implications for India's multilingual policy under NEP 2020.

The testing of P7 is particularly urgent. If children decoding in a second-language script are constrained in their Stage III instance accumulation by insufficient oral language depth in that language, then the NEP 2020 emphasis on mother-tongue-based multilingual education in the early grades is not merely a cultural and linguistic equity measure but a cognitive learning necessity. Children who build Stage I oral language foundations and Stage II decoding competencies in their mother tongue before transitioning to instruction in an additional language may achieve superior Stage III and Stage IV outcomes in that additional language because their deeper oral language foundation supports richer, faster instance accumulation. This is an empirically testable prediction with significant policy implications.

Prediction P8: Teacher Pedagogical Knowledge

Prediction P8 is the framework's most translational claim, its bridge from reading theory to teacher education and professional development. The prediction that teacher knowledge of the SAFER framework's stage architecture will predict stage-appropriate instructional decision-making, which in turn will predict student outcomes, positions teacher pedagogical content knowledge not merely as a correlate of teaching quality but as a theoretically specified mechanism. Teachers who understand why Stage II instruction is necessary but insufficient for Stage III development, and who understand what the ZPD-appropriate scaffolding conditions for Stage III are, will make systematically better instructional decisions than teachers who lack this understanding. This prediction provides a study basis for SAFER-informed teacher professional development programmes and for the evaluation of their effectiveness in terms of downstream student literacy outcomes.

5. Methodological Implications

5.1 Construct Measurement and Stage Assessment

The study and assessment implications are stated for each of the constructs at each level in the SAFER framework. The oral language portion of the assessment should include children's vocabulary breadth (both receptive and productive), as well as narrative comprehension and implicit phonological sensitivity (rhyme detection, syllable segmentation) at in Stage I all in the child's home language; in the first two this should ideally reflect what the child has advanced to, rather than language learning, which may show up as Stage II and disguised as a Stage I deficiency.

In Stage II the framework allows for the use of phoneme level awareness tasks (phoneme segmentation, phoneme deletion, blending) as the main construct measure, as well as for the standardised assessment of knowledge of grapheme-phoneme correspondences and the ability to decode unfamiliar words of well-known meanings (nonsense word reading). For Indian abugida scripts, the specific assessment tasks for Stage II should include akshara assessments (e.g., akshara recognition tasks) and akshara-combination decoding tasks, which more appropriately reflect the script-specific declarative knowledge the Stage II instruction seeks to develop.

At Stage III, the framework endorses the use of Rapid Automatized Naming with alphanumeric stimuli (letters and digits) as the primary index of procedural fluency compilation efficiency, supplemented by timed real-word reading fluency measures that capture the product of procedural compilation in familiar word recognition. Prosodic fluency rating in guided oral reading, assessed

through standardised prosody rating scales, captures the transition from Stage III mechanical to Stage III meaning-integrated reading and should be included in longitudinal research designs.

At Stage IV, the framework supports a multi-component measurement approach that encompasses oral reading fluency on grade-level connected text (rate, accuracy, prosody), reading comprehension (literal and inferential), reading self-efficacy (Wigfield & Eccles, 2000), intrinsic reading motivation (Guthrie & Wigfield, 2000), and self-regulatory reading behaviours (comprehension monitoring frequency, repair strategy use). The inclusion of motivational and self-regulatory measures distinguishes SAFER-informed assessment from conventional reading assessment batteries and is essential for testing the framework's Motivational Moderation prediction (P3).

5.2 Research Design Considerations

The developmental and predictive claims of the SAFER framework are most rigorously evaluated in prospective longitudinal designs that assess the Stage I - II predictors prior to formal reading instruction (kindergarten or pre-primary) and follow children across at least the first three years of schooling, with annual or bi-annual measurement of all four stages' key constructs. Cross-sectional designs can address concurrent architectural relationships but cannot adequately test the developmental sequencing and transitional predictions (P1, P2, P3) that constitute the framework's most novel claims.

For intervention study, the SAFER framework strongly recommends multi-arm randomised controlled designs in which conditions are assigned according to the child's assessed stage profile rather than by grade level or age alone. The stage-assignment of intervention arms -Stage II phonics for Stage II children, Stage III fluency-building for Stage III children - is essential for testing P1 and P5's instructional specificity and sequencing predictions. Intervention designs that deliver stage-mismatched instruction as a control condition (e.g., phonics instruction for a child whose primary impairment is Stage III procedural fluency) would allow particularly strong tests of the framework's specificity claims.

For cross-linguistic testing of P6 and P7, the most informative designs are those comparing stage-by-stage progression across at least three language-orthography contexts within India (e.g., Hindi/Devanagari, Tamil, and English) with a common SAFER-aligned assessment battery adapted to each script's characteristics. This would permit direct comparison of stage transition rates, the relative importance of RAN versus phonological awareness at each stage, and the moderating effects of oral language depth in the instructional language on Stage III instance accumulation.

5.3 Analytical Strategy

The structural predictions of the SAFER framework are most naturally evaluated using a combination of structural equation modelling, growth curve analysis, and moderation/mediation analysis. Latent variable SEM permits the simultaneous testing of measurement models for each stage's constructs and structural path models specifying the between-stage relationships and their moderators, with the advantage of separating measurement error from true score variance. For developmental sequencing predictions (P1, P7), parallel process latent growth curve models allow the simultaneous estimation of growth trajectories for Stage II and Stage III outcomes and the examination of cross-domain coupling, whether earlier Stage II growth predicts later Stage III growth rate, in a single integrated model.

For the motivational moderation predictions (P3, P4), moderated mediation models are appropriate. The mediation of the Stage III–Stage IV relationship through deliberate practice and instance accumulation, with reading motivation as a moderator of that mediation (i.e., motivation moderates the strength of the practice-to-automaticity pathway). Bootstrapped confidence intervals with bias correction are recommended for all mediation and moderated mediation estimates (Hayes, 2018). For teacher knowledge predictions (P8), multilevel modelling that accounts for the nesting of students within teachers within schools is necessary, with teacher SAFER knowledge assessed at the teacher level and student reading outcomes at the student level.

6. Discussion

The Skill Acquisition Framework for Early Reading advances the theoretical precision of the early reading literature in several distinctive respects. By grounding early reading development within established learning theory - specifically the skill acquisition progression from declarative knowledge through procedural compilation to autonomous performance - the SAFER framework provides a theoretically coherent account of why reading instruction must be sequenced, what the pedagogically appropriate scaffolding conditions are at each stage, and how motivational and self-regulatory factors interact with cognitive skill development to determine whether procedural reading competence transitions to authentic autonomous literacy. Each of these contributions departs substantively from existing cognitive processing architectures and offers educational researchers and practitioners a more instructionally tractable theoretical foundation.

The SAFER framework's most significant theoretical innovation is its formal treatment of reading motivation as an architectural moderator rather than a background condition. Existing reading frameworks - including influential models derived from cognitive processing architecture, componential fluency accounts, and the Simple View of Reading - typically acknowledge the role of reading practice and print exposure in building automaticity without specifying the motivational mechanism through which practice is voluntarily sustained. We formalise this mechanism in the SAFER framework, the Assuming that if children reach

stage III (procedural fluency), reading motivation is what drives the voluntary reading process that leads to the accumulation of instances needed at stage IV (automaticity). It is a theoretical statement and an instructional prescription: Stage IV outcomes cannot be assured by long-term instruction or by simply devising conditions in the classroom for self-directed reading, but they can be facilitated by developing conditions that foster self-directed reading after class.

There are a number of drawbacks to the present account which should be recognized. SAFER is a theory synthesis without primary data, and so the extent to which the SAFER framework is confirmed or disconfirmed derives from the empirical tests of the 8 predictions explicated in Section 4, which are the formal criteria for the confirmation or disconfirmation of SAFER in any particular situation or age. Second, the theories presented in this framework are based on a development of Stage I oral language skills which is underrepresented in the current exposition, while the theories' account of the acquisition skills between Stage I and II-III are not fully developed. Future explanatory work will describe more precisely how the different types of acquisition skills contribute to and are contributed to by the development of oral language in Stage I, and how different types of oral language at Stage I contribute to acquisition skills in Stage II-III. Third, the motivational moderation prediction (P3), while theoretically well-grounded, makes strong assumptions about the temporal precedence of reading motivation over automaticity development that require careful operationalisation in longitudinal study to ensure genuine predictive rather than concurrent relationships. Fourth, the framework's cross-linguistic predictions for Indian abugida scripts require empirical validation with script-appropriate measures; the current theoretical extensions to Devanagari and South Indian scripts are informed by the available cross-linguistic literature but represent extrapolations from alphabetic study contexts whose generalisability cannot be assumed.

7. Conclusion

The central contention of this paper is that early reading development is most productively understood as a progressive skill acquisition process - characterised by qualitatively distinct stages, driven by stage-appropriate learning mechanisms, supported by different forms of instructional scaffolding, and ultimately sustained by motivated, self-regulated print engagement - rather than as the unfolding expression of a fixed cognitive processing architecture. The Skill Acquisition Framework for Early Reading (SAFER), grounded in Fitts and Posner's skill acquisition model, Anderson's ACT-R, Vygotsky's Zone of Proximal Development, Logan's instance-based automatisation account, and study on reading motivation and self-regulated learning, provides a theoretically coherent and empirically tractable framework for understanding reading development in precisely these terms.

The SAFER framework's eight empirical predictions span the developmental, instructional, motivational, cross-linguistic, and teacher knowledge domains, collectively constituting a research agenda that can advance both reading science and educational practice. Its most novel contribution, the Motivational Moderation of Automaticity Development, addresses the gap between achieving procedural reading fluency and sustaining the voluntary reading engagement that builds the deep automaticity characteristic of the proficient reader. Its re-conceptualisation of the Double Deficit Hypothesis as a staging diagnostic provides a more instructionally specific and sequentially actionable framework for reading intervention design than existing alternatives. And its cross-linguistic adaptability, including specific theoretical attention to the Indian abugida script context, makes it particularly relevant to the empirical and practical challenges facing reading scholars and educators working within India's diverse multilingual educational landscape.

Early reading failure has documented, cascading consequences for academic achievement, occupational outcomes, and psychological wellbeing across the lifespan (Seidenberg, 2017). The SAFER framework contribution is not to add another theoretical architecture to an already crowded field but to reframe existing knowledge about reading development in terms that are directly actionable for the teachers, reading specialists, curriculum developers, and policymakers who bear responsibility for the quality of early literacy instruction. If the framework core claim is correct (that reading skill is progressively acquired through stage-appropriate learning, scaffolded practice, and motivated self-direction) then the question it poses to educational practice is not merely about identifying cognitive deficits but about specifying the learning conditions, instructional sequences, and motivational environments in which reading skill can be most reliably and equitably built. If there is any question that the world of educational psychology can answer, it can answer this question and in a way that educational psychologists desperately need to be able to answer.

Declarations

- Ethics Statement: This article is based on secondary data reported by others, and was therefore not subjected to requests for institutional ethical approval. No personally identifiable information was used.

- Data Availability: No new data were generated or analysed. All the empirical claims are drawn from published and publically available study.

- References: The authors have already used these. This manuscript has not received any external or institutional support or funding.

- Conflict of interest: None of the authors have any conflicts of interest.

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