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Low literacy attainments in school and approaches to diagnosis:

An exploratory study

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language impairment

Abstract

Reading and writing difficulties are markers for some forms of learning disorders, and measuring the distance between the child's performance and an expected level of attainment is a common approach to diagnosis. However, there are several problems with relying on the gap between achievement and expectation for arriving at a diagnosis, not least because the approach is essentially blind to the child's history of opportunity. An alternative approach offers children tiers of individualised programmes, and their changing strengths and weaknesses informs the diagnosis. This paper reports the findings of an exploratory study analysing the change scores of ten children who were reading two years behind their class level. We offered a two-tiered language intervention, embedded within a whole class programme, using the children's narrative writing for examining change. Our findings suggest that the profile of strengths and weaknesses gathered from a school-based intervention is a valuable complement to a clinical assessment.

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Low literacy attainments in school and approaches to diagnosis:

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Introduction

Children show individual differences in the pace and quality of the development of their reading and writing skills. In this paper, we focus on those children who are particularly slow in literacy learning when compared to their peers. Children, especially in more privileged settings, may be referred to specialist clinics for an assessment when there is reason for such concern. This is because a common assumption is that the child may have some form of specific learning disorder that is causing uneven growth in skills and slowing down literacy development. Difficulties with reading and writing are a definite marker for some forms of learning difficulties, and even in settings where the services of specialist staff are unavailable, labels of clinical significance like dyslexia, specific learning difficulties (SLD), and slow learner may be tagged to children who underachieve. But such difficulties are also a visible symptom of other underlying

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realities, including the nature and quality of teaching, the extent of proficiency in the literacy language, and access to opportunities that deepen learning. This paper will argue that because a diagnosis of a specific learning disorder is closely shaped by the educational, socio-economic, and socio-cultural context, there is a need for dynamic approaches to assessment. Indeed, the preferred approach would be to teach well, capture skill profiles sensitively, and only then test for diagnosis. In doing so, the distance often present between the teacher's assessment of taught skills and the clinician's assessment of underlying cognitive-linguistic skills may be reduced. At the theoretical level, this paper describes two strands of research: the factors that influence literacy learning and the features that define specific learning difficulties.

The gap between achievement and expectation

A popular approach to diagnosis is to gauge the distance between what the child can do (achievement) and what the child must do

Low attainments and approaches to diagnosis (expectation). This distance between performance and presumed level of attainment has come to be called the discrepancy criteria for diagnosis (for example, Stanovich, 1996; Nag and Snowling, 2012). Here, the discrepancy may be against a benchmark of attainments expected for a particular age or grade or level of general abilities.

The popular reference point in clinical practice is the diagnostic manual published by the World Health Organization called the ICD 10 and the one published by the American Psychological Association called DSM IV (with the next version, called DSM V, slated for publication in May, 2013). Diagnostic codes cover difficulties either with school achievement in general, or with reading and writing development in particular. Table 1 gives the list of disorders related to reading and writing along with the associated behaviours that are visible in the classroom.

The two diagnostic systems differ in their approach to the identification of specific learning difficulties. The ICD 10 is more

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explicit than DSM IV about the extent of delays that must be recorded before a diagnosis is considered (the DSM V is attempting to do away with the discrepancy formula). These diagnostic systems are, however, fashioned after medical models. What this means is that the disorders listed are sometimes different from the manifestations of the difficulty readily recognised within schools. Given below are examples of disorders coded in the diagnostic manuals but that do not easily fit into the patterns of difficulty observed by teachers:

- Diagnostic codes have been assigned for a ‘specific’ difficulty with reading and for a ‘specific’ disorder with spelling. Such modular manifestations of difficulties are, however, rare. In English, for example, the links between letter-sound and sound-letter are often inconsistent, making the system opaque, and we find poor reading and difficulties with spelling usually co-occurring. Another language may have a more regular linkage between symbol and sound, but may not carry this transparency into the mappings between sound and spelling. In such instances, learning to read becomes easier than learning to spell. Indian languages like

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Bengali, Gujarati, Hindi, and Kannada have this asymmetric mapping between sounds and the *akshara* symbols, making spelling difficulties far more visible in the classroom than reading difficulties. However, even in these languages, specific learning disorders are less common, and teachers often describe children as showing difficulties in multiple areas.

- Disorder of written expression is another diagnostic code. Such specificity in literacy difficulty is again rare. A difficulty with written expression manifests in difficulties with grasping the discourse structures in texts and with using these structures productively. The difficulty is visible at the level of writing essays, stories, and other forms of narratives or expository texts. But difficulties in children's written expression are rarely conceived by clinicians or teachers as being solely at the level of narratives and broader discourse structures. The difficulties are instead seen as concurrent with, and perhaps emerging from, more foundational difficulties with the reading and spelling of single words.

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Table 1. Areas of visible difficulty, their disorder names in two Diagnostic Manuals, and terms as used by specialists

<i>Visible area of difficulty</i>	<i>Disorders listed in ICD-10</i>	<i>Disorders listed in DSM-IV</i>	<i>Common terms used by specialists</i>
Reading accuracy	Specific reading disorder	Reading disorder	Specific learning difficulties (SLD), dyslexia or developmental dyslexia, may be linked with specific language impairment (SLI)
Reading speed			May be linked with SLI
Reading comprehension			
Difficulties with learning to read resolved but showing continued difficulties with spelling		-	Dyslexia (but considered as having good compensatory strategies available)
Spelling accuracy (and confirmation of clear history of smooth attainments in reading development)	Specific spelling disorder	-	Specific spelling difficulties or developmental dysgraphia
Writing skills (difficulties in expressive writing as seen in compositions, story writing, and other forms of narrative writing)	Other developmental disorder of scholastic skills	Disorder of written expression	Typically noted as an accompanying feature of SLD or SLI
Reading and/or spelling accuracy, reading comprehension, and/or arithmetic	Mixed disorder of scholastic skills		Dyslexia or an accompanying feature of SLD or SLI

Notes: The term ‘specific’ in ICD and DSM systems refers to a deficit that is observed when general abilities (IQ) are in the normal range; an IQ of 70–85 and above is usually assumed.

The many issues in defining the gap

Several cognitive and linguistic processes contribute to the development of reading and writing skills. An equally influential factor in development is the socio-educational ecology within which these skills grow. One example from the socio-educational world of the child is the quantum of immersion in the language of literacy instruction. Learning to read and write in one's home language perhaps offers the most comprehensive exposure to the language, with less satisfactory levels of immersion often occurring when the language is not dominant at home, but which, either because of historical or more recent socio-political forces, has prestige and dominance in the education system. The influences of the ambient language space on the development of reading and writing are multiple; vocabulary knowledge, grammar learning, awareness of usage patterns, and ease of expression thrive on exposure and practice. Another aspect of the socio-educational ecology is the number of languages in which a child

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gains literacy. Becoming bi-scriptal or multi-scriptal may occur through simultaneous instruction or sequentially, with additional languages introduced at different stages in a school career. Any understanding of the gap between achievement and expectation must be mindful of these realities.

The discrepancy formula favoured by the diagnostic manuals is particularly difficult to apply when the literacy environment leaves children far behind in their attainments. Print-rich homes, role models who read and use literacy skills productively in daily life, and daily instruction that nurture learning are all dimensions of a well-endowed literacy environment. Children who miss any or all of these supports for literacy learning begin to fall behind. Delays in literacy development following poor opportunity mirror the profile of attainments seen among children with dyslexia and other forms of specific learning difficulties. Thus, children who receive sporadic reading instruction and with little access to books

Low attainments and approaches to diagnosis may stumble when reading (poor reading fluency), struggle with questions about a text they have just read (poor reading comprehension), and make several errors in writing (poor spelling, poor narrative writing). If large numbers of children in a particular school are below the expected levels for their grade and age, it is most unlikely that all these children are eligible for a clinical diagnosis. They may, for example, show a '*dyslexia-like picture*' but not a cognitive profile that is typical of dyslexia. This has led to a call for extreme caution in the use of labels:

Clarity about this distinction between the disorder and environmentally induced underachievement that mimics the disorder is essential. Without such a distinction there will be an over-diagnosis of the disorder and an unacceptable use of a deficit/disorder perspective for all interventions. (Nag and Snowling, 2012, p. 6)

Another challenge for diagnosis is the measures that are used for assessing children. Normative data are information about the

Low attainments and approaches to diagnosis typical level of performance or the expected standard on a particular test. The absence of such standardised test information is marked in India. This is true not only for tests that assess the underlying cognitive processes that aid in diagnosis, but also true for the several aspects of reading and writing that can inform us of the child's attainments. When such comparison data are not available, comments on delays and deficits raise genuine concerns about the reliability of the test information. In other words, test results in the absence of normative data are an unreliable measure for diagnosis. This is yet another reason why there is a need to go beyond a test-and-tell method of diagnosis.

The unit of comparison that has been chosen for the discrepancy formula has also turned out to be problematic. If we take age as the unit of comparison, the assumption is that classes are mono-grade and that there is a close match of age and grade. But the criteria for age and grade for school admission may not be so rigid, and older

Low attainments and approaches to diagnosis children may be taken into lower classes. Moreover, a narrow band allotment of age-for-grade is contrary to the arrangements made in multi-grade schools. These settings have a wider age range of children working together, and the learning targets may not follow a strict year-wise framework. One outcome of such an arrangement is that discrepancy criteria for age and grade are more difficult to apply, particularly if the expectations related to age and grade have been articulated in terms of the linear, 12-monthly transitions characteristic of mono-grade settings.

Turning next to the discrepancy index between intelligence and attainment, the assumption here is that a higher IQ is associated with better reading scores. However, the use of discrepancy criteria to indicate a learning disorder has been challenged by evidence from several studies that have failed to show anything more than a modest correlation between IQ and reading skill (for example, Fletcher, et al., 1994). A discrepancy formula based on IQ is thus

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There is one final difficulty with global descriptions of a gap between achievement and expectation and the use of discrepancy criteria for diagnosis. The approach does not give information about what may be the best way to intervene and support the child.

Offering assisted learning first

An alternative approach to understanding children's underachievement is to defer diagnosis and first arrange for a period of focused teaching support. This is particularly important since there is a serious possibility that the reading and writing

Low attainments and approaches to diagnosis difficulties faced by many children are because of poor-quality literacy instruction, and of being in environments where daily living is not imbued with the excitement of books and reading. Such a *quality-first* orientation to diagnosis has come to be called the Response to Intervention (RTI) approach in the clinical literature (for example, Fuchs and Fuchs, 2006).

Several models for RTI are available and can be categorised based on how many layers of support are made available to the child (for a review, see Fuchs and Fuchs, 2006). In a single-tier model, a quality programme is offered to all children in class for a fairly long time (for example, one year, or two) and then the assessments begin to identify children who are showing delays. In a two-tier model, an intervention is offered, followed by a period of waiting for the taught skills to consolidate, and then a second, more intensive intervention is implemented for those who do not show spontaneous and continued growth. In this model, the

Low attainments and approaches to diagnosis assessment for diagnosis occurs after the two tiers of intervention and the interim wait-and-watch period have been completed. The three-tier model is delivered, as the name suggests, in three waves of support focusing on those children who remain behind with each tier of intervention. Each successive tier is progressively more intensive, with smaller and smaller groups of children receiving direct teaching. The final tier may even be a one-on-one intervention. The first and broadest tier in this model may be a modification of the mainstream language programme. The second tier may focus on a smaller selection of targets, and the third tier on a specific set of cognitive functions and/or a circumscribed literacy area. Modifications of targets in successive tiers can be in the area of the decoding of words for reading or for spelling. Other areas of modification are the foundational skills for inference-making during passage reading and the quality of expressive language in narrative writing. Many of these models of successive support may be recognisable as the models that nurturing teachers have intuitively constructed for children in their charge who have

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been difficult to reach. Most clinicians are however new to such a
long term orientation to diagnosis.

The inherent strength of the RTI approach is the commitment to
implementing the targeted interventions, and clearly this is the way
forward when working with children whose literacy development
is shaped by the long arm of socio-educational disadvantage.

Despite this positive feature, two assumptions that underpin the
RTI approach are problematic. First, RTI as a diagnostic initiative
assumes that non-response to an intervention is a sound way of
identifying and classifying children with learning disorders. But a
good intervention is meant to help children with learning disorders
also change, even if this is by giving them compensatory strategies
to sidestep the core areas of their deficits. Hence, the showing or
eliciting of a positive response to an intervention cannot be a
sufficient reason for giving up a diagnosis. RTI can also be a
socio-political initiative for adopting or implementing a fair and

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equitable approach to diagnosis where we teach first and diagnose later. Herein lies the second problematic assumption: if poor performance is attributable to earlier disadvantage, then a wait-and-watch stance is the preferred approach to diagnosis. In an attempt at ensuring an ecologically valid process of support for the child, the approach may end up withholding the benefits of early identification. The RTI approach thus can be sensitive to quality intervention and can bring about a preventative focus on children at risk for low literacy. The approach cannot, however, offer a quality assessment that can build a broader picture of the child (Hale, et al., 2010).

A process approach to diagnosis

This paper proposes a third approach to diagnosis: a *process approach*, which has a long-term orientation to assessment and is focused on developing a comprehensive and theoretically motivated profile of the child's strengths and weaknesses. In this

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context, we define ‘process’ as a series of actions that progress systematically towards an end, the end in this case being diagnosis.

The process approach has evolved out of our rejection of the discrepancy approach as overly simplistic and out of our acknowledgement that the response-to-intervention approach is ideal for prevention, but not reliable for a diagnosis of the learning disabilities. The process approach comprises waves of assessments that begin with the development of a baseline of the child’s learning profile, which is then monitored periodically. In the period between assessments, quality interventions are provided.

Both the development of the profile and the mapping of the intervention to the child’s learning profile are critical in this approach. As in the response-to-intervention approach, the process approach offers tiered programmes that address specific learning needs. However, an imperative that we have specified for the process approach is that the intervention should be based on a framework that can be justified theoretically. This is meaningful both educationally and clinically. Turning to assessment, the

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purpose of monitoring is to capture change over time, and this too
must have a sound theoretical underpinning and must cover areas
that can inform diagnosis. Learning is to be placed firmly at the
heart of all efforts aimed at building the child's profile, and the
points for assessment will be referred to as learning indices.

We present next an exploratory study to examine this approach.

An exploratory study

The programme we report here began in 2008 with a cohort
of 33 children in Grades 3–4 in a government-run primary school
situated in a peri-urban area with an urban-rural hybrid landscape.
We were offering a supplementary Kannada-language programme
(Kannada is a language of south India) and the opportunity for
examining the outcomes of the process approach became available
because we were asked to intervene in two waves. The children we
worked with were between the ages of 7 and 9 years, and the

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intervention was delivered by a visiting teacher skilled in the intervention developed for this study. Some children attended school irregularly, but the more frequent disruptions were the result of unscheduled school closures and of the teachers being pulled away from school because they were required for performing census duties and other non-curricular tasks. Most children were either bilingual or multilingual, but were learning to read only in Kannada. Many were from print-starved homes and had few role models for the productive use of reading and writing in day-to-day life. In the school, we did not record instances of active discrimination against individual children. However, we also did not see the rich cultural and linguistic heritage of the children being drawn into the school programme. Moreover, over the two-year period of the study, we found teachers in all sections of the primary school paying little attention to language discontinuities between home and school. For example, even though children from mushrooming settlements for migrant workers were joining the school, no introduction to the school

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language was offered for the new entrants (the enrolments were mainly in the early grades and not in the class participating in the current study). Reading for fun and activities that nurture the ‘voice’ of the child in the classroom were rare, the exception being NGO-initiated book days. In summary, the reasons for disadvantage were different for different children in our study.

The next sections give the theoretical framework, describe the intervention programme, and present our analyses of the children’s performance to better understand the process approach to diagnosis.

A theoretical framework

This short section lays out three key theoretical positions that are of relevance to the process approach. First, socio-cultural perspectives that undergird learning are important to the process approach. Included within this perspective are the effects of the ability of young children to engage socially and the effects of

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social-educational advantages and disadvantages on literacy learning (for example, Teale and Sulzby, 1986; Uccelli, et al., 1999; Amritavalli, 2007). Second, the evidence base from neuroscience and behavioural genetics, especially in the area of dyslexia and specific language impairment (SLI), is also important in identifying the markers of clinical syndromes. These include the findings about the role of phonological processing deficits in dyslexia and of grammar learning difficulties in SLI (for a review, see Nag and Snowling, 2012). Finally, evidence has accumulated in the last few decades to allow for the development of a detailed cognitive-linguistic framework for a process approach to the diagnosis of low literacy. Irrespective of the language of literacy learning, interconnectedness is seen between literacy and language (for example, writing systems using the akshara: Nag, 2007; Chinese characters: Tong, et al., 2011; and the alphabet: Muter, et al., 2004). Aspects of children's early language such as phonological skills, vocabulary knowledge, and morphological awareness are all predictors of literacy skills. Similarly, aspects of

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early literacy are predictors of later language attainments. Thus, reciprocal associations are seen between phonological skills, vocabulary knowledge, and decoding skills, as well as between listening comprehension and reading comprehension. These converging lines of evidence are reflected in several current multifactorial, cognitive-linguistic models proposed for the understanding of literacy difficulties (for example, Ho, et al., 2002; Pennington, 2006; Nag and Snowling, 2011a).

In summary, the reasons for low literacy attainments in our study are several. The development of the learning indices for assessment and the tiered language programmes for intervention are underpinned by (at least) five assumptions: (1) multiple contextual factors and within-child factors influence literacy attainments; (2) both spoken and written language domains are critical for literacy learning; (3) each of these language domains has several sub-components; (4) their influence on each other is

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reciprocal; and (5) interventions that link spoken and written language symbiotically can boost literacy development.

The two-tiered language programme

Tier 1 of the programme was offered when the children were in class 3, and Tier 2 was offered six months later when they were in class 4. In Tier 1, children received 46 sessions and in Tier 2, 48 sessions. The sessions were held four times a week for the duration of two hours comprising four periods called *Talk*, *Text*, *Hands-on*, and *Publish* (see Table 2 for a sample lesson). The *Talk* period focused on spoken-language skills. The *Hands-on* period included word-level activities. The hands-on activities especially targeted decoding at the level of the akshara in words (thus the two akshara in su.rya [sun] but three akshara in na.ksha.tra [star]) and at the level of morphemes (thus in the word ‘dancers’, the first unit is ‘dancer’, which is derived from the root ‘dance’, followed by the

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number marker ‘-s’ to communicate plural). The *Text* period required children to read a self-selected text and then write a summary of what they had understood from their reading. This was essentially time for a reading comprehension activity and the first drafts of narrative writing were developed in this period. The last period of the session was *Publish* when the focus was exclusively on narrative writing. Children were supported with instructions to try specific sentence constructions to improve their narrative style (for example, use of connector words like ‘and’ and sequence words like ‘thereafter’). These four periods were conducted for all children in the class, but specific worksheets, word lists, textual material, and assignments were adapted for three levels—the low-, middle-, and high-attainments groups in the class. Approximately 20% of intervention time was set aside for the decoding of words into akshara or component morphemes. The main focus of the intervention (covering approximately 80% of intervention time) was with connected texts drawn from story cards such as the *Chili pili cheela* (2007). The *cheela* is a bag of 100 cards with texts

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covering several genres, rich illustrations, and a set of supplementary activities for both spoken and written language.

Table 2. A sample of a lesson for the two-hour session used in Tier 2

Talk	Hands-on	Text	Publish
<p>Children tell each other riddles about the Coconut Tree (its fruits, leaves, and roots, and its products like oil, rope, and thatch).</p> <p>Material: Pictures</p> <p>Learning Outcome Child is able to respond to inferential questions.</p>	<p>Describe pictures. Pick out appropriate words to label the pictures.</p> <p>Material: Verb and noun flashcards</p> <p>Learning Outcome Child is able to identify words</p>	<p>NANNA ARIVU Read about the Coconut Tree and write the story in own words.</p> <p>Material: Story card</p> <p>Learning Outcome Child is able to construct simple narratives.</p>	<p>Prepare own story in ‘book’ form, with page layouts, illustrations, and story title.</p> <p>Material: Paper, colour pencils, stapler, gum</p> <p>Learning Outcome Child is able to present simple narratives for others to read.</p>

Note: The specific worksheets and the activity details differed for each of the three attainment groups.

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At the beginning of each tier, a screening test, Literacy Acquisition Battery (LAB) (Nag, 2008), was used to group children into three attainment levels. The LAB assesses accuracy in reading and spelling words, and comprehension of short passages that the children read out loud. A total of all the test scores is used as the consolidated Literacy score, and children are grouped into a middle-attainments group (+1 to -1 standard deviation), a low-attainments group (below -1 standard deviation), and a high-attainments group (above +1 standard deviation). Thus, the grouping is based on performance on several sub-skills of literacy, and also based on comparisons among students in the same class to which the child belongs. In Tier 1, there were 15 children in the lowest group. After a six-month period, during which children received regular instruction and no supplementary inputs, we did a review of children's attainment profiles, and this time placed only 10 of the Tier 1 low-attainments group of 15 in the Tier 2 low-attainments group. The repeat assessment was conducted using the LAB, the same tool used at the start of the intervention. If the

Low attainments and approaches to diagnosis prescribed textbooks in the school are taken as a measure of grade-wise expectations, then the 10 children with the lowest attainments were more than two years behind their grade in reading and writing attainments.

Using children's writings

Children's narrative writing is a fertile source of information both for understanding what works in a teaching programme as well as for purposes of diagnosis. Poor narrative writing could be indicative of a low proficiency in the language. Difficulty with composition and story writing also suggests a general difficulty with the learning of spoken language skills, which has been carried over into written language, but in addition may represent a more selective impairment only in written expression. The foundational skills that underpin this particular literacy task include accurate writing (spelling and handwriting), creative use of words and sentences (vocabulary and grammar), and making links and

Low attainments and approaches to diagnosis sequencing ideas to create a coherent text (the discourse structure). Children may show difficulties in any number of these aspects of narrative writing because of difficulties in working memory and sequencing, subtle grammar learning difficulties, particularly when the grammatical markers are not perceptually prominent, and learning about the pragmatics in language. Certain genetic profiles appear to be more closely associated with many of these cognitive deficits, suggesting a biological explanation for the disorders. But print-starved environments, absence of bridge programmes between home and school languages, absence of structured instruction, and language programmes that do not engage in creative writing can all slow down the development of narrative skills. Thus, even though a poorly written text may be reflective of impairments that have a broad biological basis, such a possibility can only be considered if a history of poor opportunity has been genuinely compensated with a supplementary language programme being made available to the child.

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In our study, both Tier 1 and 2 interventions had a strong focus on narrative writing skills. Practice for writing was structured around an activity called '*nanna arivu*', which can be roughly translated as '*the essence that I have abstracted*' from the text. Triggers for writing were either a set of story cards (*Chili pili cheela*, 2007) or excerpts from the prescribed language textbook. Children read texts and wrote summaries, which were then published for others in class to also read. Instructions for children's written narratives followed a sequence of focus areas: writing the main idea units, using the connector 'and', using specific inflections (for example, to, for, of), and using a selection of transitional tags to communicate time sequence (for example, first, next, afterwards, and then). In a pre- and post- assessment of Tier 2, we had asked children to write a story based on a picture of a tiger wearing a scarf and clutching a handkerchief, clearly suffering from a terrible cold. These are the stories that we analysed. Here, children's performance is taken as a proxy for written production, spelling,

Low attainments and approaches to diagnosis and use of grammatically more complex language (see Box 1 for a sample of narrative writing).

Box 1. Tiger with a cold: Sample of narrative writing by Child N.

Pre-assessment: Two sentences from a list of six sentences

Sentence 2: *ondu huDigibandi hulige ouShadi koTTaLu*

(One girl came, gave medicine to the tiger).

Sentence 6: *ondu kaaDinalli huli vaasavaagittu.*

(The tiger used to live in one forest.)

Post-assessment: Third and final paragraph in the story

huDugi ondu ouShadhi soppannu tandaLu. hulige adannu tandu koTTaLu. huli adannu tinditu. adu ondu tingaLu adamEle jwara, negaDi, shiita hOyitu. huDugige dhaanyavaadagaLu endu hELitu

(The girl brought one medicinal leaf. She brought (and) gave that to the tiger. The tiger ate the leaf. After one month, the fever, cold, (and) cough disappeared. The tiger thanked the girl.)

Changing profiles of strengths and weaknesses

We first examined changes in children's performance irrespective of the attainment band under which they fell. At the start of Tier 2, children were writing, on average, seven sentences with about three words per sentence. By the end of the programme, children had written 11 sentences with about five words per sentence. We also recorded that before the start of the language programme, 30% of all words in the story had spelling errors, up to 11.9% were nonsense words (akshara strings with no meaning), and 3.5% words were in the child's home dialect. At the end of the language programme, spelling errors had dropped to 17% and nonsense words had almost disappeared (0.9 %). The number of dialect words had also declined (1.9%), suggesting that the programme had, unwittingly perhaps, shifted children's usage to Standard Kannada. Finally, apart from more nouns and verbs appearing in the stories at the end of Tier 2, children's stories showed an increase in the use of adjectives (0.13% to 1.63%), pronouns

Low attainments and approaches to diagnosis (0.54% to 5.01%), determiners (0.54% to 2.52%), and connectives (1.35% to 26.41%). Examples of adjectives used were *sihi* (sweet) and *doDDa* (large), pronouns *naavella* (we all) and *avaLu* (she), determiners *obba* (one) and *aa* (that), and connectives *nantara* (after that), *aavaga* (and then) and *adakke* (because (of)). Many of these words were not taught in the sessions, suggesting that children were spontaneously extending their vocabulary knowledge into their narrative writing. In Kannada (and in many Indian languages), case markers are suffixed to nouns to communicate relationships such as ‘to’, ‘from’, and ‘for’. Suffixes also give information about person (first, second, and third person), number (singular or plural), and gender (male and female), in short referred to as PNG markers. On verbs, apart from the PNG markers, inflections also communicate tense (present, past, future, etc.) and voice (passive, active). Children’s errors had halved on both noun inflections (6.42% to 3.39%) and verb inflections (42.28% to 21.61%), suggesting the accurate use of more complex grammatical markers. Taken together, the trends from the pre- and

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post-assessments indicate improvement in the knowledge of the language and in its use in narratives. This improvement is irrespective of the attainment level at which children began at the start of the Tier 2 intervention.

The next analyses focused on the 10 children with the lowest attainments. We had seen skill development in this group during the six-month Tier 1 programme—a positive response to intervention, but insufficient to close the gap with class-level attainments. We also saw further growth in reading and writing skills during the next six months when regular classroom teaching was in progress. But despite this, the reading and spelling attainments of the group of 10 children before the start of the Tier 2 programme were more than two grades below their class level (while in class 4, the children’s performance was similar to the performance of children in a well-functioning class 2). These children clearly needed a more focused intervention, which is what we attempted in Tier 2. We examined the changes seen in their

Low attainments and approaches to diagnosis skills on a set of five learning indices. Two measures, the number of sentences in the story text and the number of words per sentence, were taken as indices of how productive the children had been on the task. Accuracy in spelling was taken as an index of both akshara knowledge and phonological decoding skills. The number of nouns and verbs used by children in their story writing had increased by the end of the Tier 2 programme. The final two measures assessed accuracy in the inflections that were tagged to these nouns and verbs. Here accuracy was taken to be an index of knowledge of the grammar of the language. Details of these five learning indices are reported in Table 3, with information on the areas in which the child has caught up with the class average and the areas in which the child has remained substantially behind, here defined as performance below 1 standard deviation of the class average.

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Table 3. Changes in children's performance on the five Learning Indices covering written language production, spelling, and grammatical complexity

Child	No. of sentences	Words per sentence	Spelling	Noun inflections	Verb inflections
ASh	✓	✓	✓	✓	✓
FH	✓	✓	✓	✓	✓
GSh	✓	✓	✓	↓	✓
KT	✓	✓	✓	↓	↓
KV	✓	✓	✓	✓	✓
ND	✓	✓	✓	↓	↓
RSh	✓	✓	✓	✓	✓
SL	✓	↓	↓	↓	↓
SY	↓	↓	↓	↓	↓
VT	✓	↓	↓	↓	↓

*Note: ✓ Child's performance is at or above class average,
↓ Child's performance remains below 1 standard deviation of class average*

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Two children (KV and RSh) moved into the middle band of attainments in this class for language production, spelling, and use of complex grammar. All but one child (SY) had become more productive in their writing of sentences, but for three children (SY as well as SL and VT) the number of words in a sentence and accuracy of spelling of many words remained below the class average. We also found stark differences in this group of 10 children in the degree of change for accurate use of inflections. While four children closed the gap with the class average, for six children grammar learning was the least prone to change. The nature of the change described above suggests that caution in making a diagnosis is useful and wise. In the case of at least two children, no gap was seen between task-specific achievement and class-specific expectations for age and grade when stringent discrepancy criteria were applied. The change noted in these two children is doubly reassuring from a clinical point of view because it spans across a range of language indices and therefore reduces doubts about whether we might have missed a disorder where the

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growth in skills continues to hide underlying deficits. Such a misclassification would have been an equally problematic issue since the intervention may have been prematurely stopped or the monitoring of potential difficulties in the future suspended.

What about the six children who continued to struggle even after experiencing two tiers of adapted interventions? It is perhaps now possible to begin considering the clinical syndromes that the children may have had. Their profiles, particularly of the difficulties that persisted, give some indication of this. Spelling difficulties, for example, can be taken as a sensitive marker for poor akshara knowledge and phonological decoding difficulties (Nag, 2007; Nag et al., 2010), and children with persistent difficulties in this area may have dyslexia. Knowledge of inflections, on the other hand, can be taken as a marker of poor broader oral language skills (Nag and Snowling, 2011b), and persistent delays in learning about inflections is indicative of specific language impairment. In our group of six, three children

Low attainments and approaches to diagnosis (GSh, KT, and ND) appear to have a specific language impairment. The rest (SL, SY, and VT), with co-occurring difficulties in literacy (spelling) and language (inflection knowledge), would perhaps fulfil the criteria for dyslexia, which is seen often among children who have specific language impairment. These are tentative leads that would need further confirmation through assessment beyond literacy and language, into underlying cognitive domains such as phonological processing and morphological processing. It is around this point in the process approach that the expertise of the specialist becomes relevant for clinical assessment.

Discussion

Our exploratory study showed that narrative writing is a useful source of information. The narratives produced by children allowed for inferences to be made about their attainments in several component skills of literacy and language. What makes

Low attainments and approaches to diagnosis narrative writing by children a particularly attractive information base is the relative ease with which they can be gathered. Our study also showed that a supplementary programme that comprises a spoken-language component (*Talk*), word-level work (*Hands-on*), reading-comprehension practice (*Text*), and narrative-writing practice (*Publish*) can improve both basic spelling and skills for narrative writing, as well as the broader oral language related to vocabulary and grammar. Finally, our study showed that process data collected from tiered programmes is useful for diagnosis. The rest of this section will focus on some conceptual issues related to each of these points.

In the process approach to the diagnosis of learning disorders, more so than the de-contextualised cross-sectional approach, it is essential to be alert to the manifestations of the emergent skill and to its basic and more advanced forms. For these advancing trajectories to occur, approximations to the ‘standard’ are a necessary condition. Examples of approximations are the

Low attainments and approaches to diagnosis ‘invented’ spellings of beginning writers who use their burgeoning knowledge of the language and the writing system to put the word down in writing. These approximations can be reduced to being ‘errors’ deserving ‘corrections’. However, from another perspective, they can also be taken as revealing the current state of the cognitive-linguistic domain that is of interest for a diagnosis. This is a fine distinction but one that is essential if using information derived from the process approach. Moreover, it can sometimes be far from clear whether the changes seen in the skills we assess are because of the intervention or whether they are the result of a natural progression towards greater levels of complexity and fluency—like attempting to capture the movement of a moving target. Another closely related issue is the extent of openness, risk taking, and personal expression that the learning environment allows. If classroom (and intervention) practices are intolerant of varieties of children’s expression and insistent on presentation in a prescribed format, then the material available for process assessment becomes stilted and homogenised. Such material has

Low attainments and approaches to diagnosis little value in the examination of individual differences. Clearly, then, the monitoring parameters and the learning indices used in the process approach are as context dependent as the performance of the children we assess. All of these issues apply whether we choose to capture change through narrative writing, as we did in our study, or we use other windows into examining children's development such as their oral narratives or their inferences after they have read a passage.

Change profiles and classification

What is the relative usefulness of a process approach for the identification of children with learning disorders when compared to cross-sectional assessments? In our study, the poorest performing children identified by the screening tests came from educationally vulnerable backgrounds. While we collected baseline information (in order to inform the development of the intervention), we rejected building a diagnosis at the time because

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we believed that the child's performance would inform us about the history of opportunity rather than an actual clinical syndrome such as dyslexia or specific language impairment. We instead offered individualised programmes within small group settings and waited for emerging skills to mature. When information from the learning indices collected at the end of the programme (the narrative writing data) is compared with the grouping based on cross-sectional information collected at the beginning of the programme (the screening test, LAB), we found the number of *false positives* to be quite high in the cross-sectional method.

Following intervention, two children had shown improvement on several learning indices and had moved to normative levels of performance in their class. Our study suggests that moving away from a cross-sectional to a process-oriented framework reduces the possibility of the false classification of children, especially when the child who is showing low attainments is vulnerable because of socio-cultural or socio-economic disadvantage.

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There are aspects of the process approach that remain to be understood. First, disappointing results following an intervention may be because the programme itself is of uncertain quality. For example, the intervention may have poor resonance with the cultural context of the child, and therefore spark little engagement between the child and the programme. Poor response may also be because the focus of the intervention is different from the specific area of difficulty faced by an individual child. Thus, for children learning to read in a non-dominant language, vocabulary, grammar, and usage skills are emergent and in need of active support, but the intervention may focus on the teaching of reading with little attention to oral language proficiency. In all such instances, the computing of responders and non-responders to the intervention would be futile, once again mis-classifying children.

Second, there is the issue of who the child's profile should be compared with. In our exploratory study, we offered a common programme to all children in a class with adapted activities as the

Low attainments and approaches to diagnosis intervention targeted at the lowest-performing children. We then used the performance by the entire class to develop the norms for measuring the level of attainment as well as the pace of change. This is quite a robust way to pick out children who are falling behind. But the reality in many classrooms is that an intervention, often called a remedial programme, is offered to a select few. Comparative information about the change brought about by, or resulting from, an intervention can then be gathered only on the basis of the performance of the few students who participated in the intervention, all of who have fallen behind the class level. In such a case, an underachieving group becomes the normative group. A diagnostic approach that is based on comparison with children who all began with a similar delay in attainments would be unusual, with a bias for *false negatives*.

In this exploratory study, we followed up the implementation of the process approach with a comprehensive clinical assessment. Therefore, children GSh, KT, ND, SL, SY, and VT, who had

Low attainments and approaches to diagnosis remained behind the class average at the end of the Tier 2 intervention, received an assessment in cognitive-linguistic areas that are known to be of diagnostic importance for dyslexia and specific language impairment. This clinical assessment allowed for checking the level of convergence in the current profile of strengths and difficulties and processing difficulties. Examples of processing difficulties that have clinical significance are difficulties with speed of processing, difficulties with phonological processing, and difficulties with processing of inflectional morphology. The greater the convergence, the closer we were to capturing a more comprehensive attainments profile. Our study suggests that complementing process assessment with a comprehensive cognitive-linguistic assessment is the best way forward for making a diagnosis when educational opportunities are uneven, and the socio-economic and socio-cultural context does not offer adequate support for closing the gap between achievement and attainment. The use of multiple sources of information, over a period of time, offers an evolving view of the

Low attainments and approaches to diagnosis child's profile and allows for caution to be exercised in labelling off children with the names of clinical syndromes.

In preparation for the process approach

Some challenges pertaining to the implementation of the process approach in mainstream school settings became clear to us during the course of the study. First, the sets of skills and knowledge needed for implementing the process approach may not be located within one school professional. The development and transaction of a quality learning programme requires skilled teaching and lesson planning, while the analysis of children's productions requires basic psycholinguistic knowledge. In our study, the intervention was conducted by a teacher who had qualified as an early childhood educator through finishing a certificate course after high school and who had close to 12 years of experience in assisted learning methodologies with socio-culturally marginalised children. The scoring of the narrative content was done by a

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clinical psychology postgraduate, with close to two years of experience in the analysis of children's language production. Our study suggests that forging a partnership between skilled teachers and process-oriented assessors is a way forward in reducing the tendency for the hasty labelling of children.

Second, a child may get labelled by inadequately trained staff whose adoption of the tiered steps is mechanical, and whose appreciation of the importance of developing a profile of strengths and weaknesses is superficial. School counsellors, social workers, remedial teachers, and concerned school staff may want to proactively ensure that the school's response to low attainments is twofold:

- offering teaching programmes that have a multi-factorial understanding of a child's learning needs and
- using skilful assessment across multiple domains to track changes over time

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At this point, it is also appropriate to state that the process approach is not meant to undermine the role of the specialist or that of the assessments situated within a clinical setting. However, de-contextualised test data are wasteful and blind to the needs of the whole child. On the other hand, process data can provide the context for clinical assessment. A third challenge is to not turn any and all outputs from children into material for scrutiny and diagnostic assessment. The reason for this is simple: if we agree that making errors is a step towards learning, then the random picking of a child's work is restrictive of free expression and discourages the child from taking risks in his or her work. While in our study we allowed for close to 50 sessions to be completed between assessments, more research is needed to know the implications of different time intervals between each wave of assessment. In the meanwhile, a useful rule of thumb to follow is for learning time to be child led and for teaching, and diagnosis, to be not put on the 'fast track'.

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