

Handbook of INDIVIDUAL DIFFERENCES IN READING

Reader, Text, and Context



Edited by
PETER AFFLERBACH

Handbook of Individual Differences in Reading

The central unifying theme of this state-of-the-art contribution to research on literacy is its rethinking and reconceptualization of individual differences in reading. Previous research, focused on cognitive components of reading, signaled the need for ongoing work to identify relevant individual differences in reading, to determine the relationship(s) of individual differences to reading development, and to account for interactions among individual differences. Addressing developments in each of these areas, this volume also describes affective individual differences, and the environments in which individual differences in reading may emerge, operate, interact, and change.

The scant comprehensive accounting of individual differences in reading is reflected in the nature of reading instruction programs today, the outcomes that are expected from successful teaching and learning, and the manner in which reading development is assessed. An important contribution of this volume is to provide *prima facie* evidence of the benefits of broad conceptualization of the ways in which readers differ. The *Handbook of Individual Differences in Reading* moves the field forward by encompassing cognitive, non-cognitive, contextual, and methodological concerns. Its breadth of coverage serves as both a useful summary of the current state of knowledge and a guide for future work in this area.

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*Edited by
Peter Afflerbach*

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*This volume is dedicated to the memory of
two wonderful people:*

*Joan Kelly Afflerbach, Librarian,
New York City Public Schools, and*

*Lois Grimes Afflerbach, Librarian,
Queens College, City University of New York.*

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Foreword

Perusing the chapters in the *Handbook of Individual Differences in Reading: Reader, Text and Context* got us in a historical state of mind as this book's appearance will mark thirty-five years since the present two writers embarked on our own studies of individual differences in reading development. Work in the field was extremely sparse then, not interdisciplinary at all, and fairly narrowly focused. This wonderful volume edited by Peter Afflerbach certainly demonstrates that we have come a long way since then and that all three of these deficiencies have been largely remedied. Areas that had just been opened up in the 1980s are now dense with detailed findings and important theoretical developments. Areas of study that barely existed in the 1980s are now fields with strong momentum. All are represented in the volume.

In a volume of such diversity and such quality it is hard to think of "value added" comments that might have some generality as opposed to being applicable to only a couple of selected chapters. Two generic points do come to mind though. They represent two issues that we discussed over thirty years ago that at the time were largely unrecognized in reading theory. The two interrelated issues do in fact receive more attention now, although perhaps *still* not as much as they should.

One of our oldest admonitions to the field was that models of reading development must be used to constrain theories of individual differences, and must be used in addition to constrain models of reading disability. That is, speculations about the causes of individual differences in reading acquisition need to be constrained by a specified model of the reading acquisition process itself. Confusion reigned in our field throughout the 1970s and 1980s because studies of individual differences had uncovered a plethora of information processing tasks on which the performance of skilled and less skilled readers differ. However, the field was not allowing any of these to be "killed off" in a Popperian sense because they were not convergent with an emerging consensus on a developmental model of reading. Byrne (1992) articulated the problem very cogently:

One thing that could be said about this rather long list of possible causes of reading problems is that it is needed, because reading is multifaceted and because there are many kinds of problems. This is a standard line of reasoning . . . [but] given the uncertainty about a typology of reading difficulties and given that fewer explanatory constructs than reading problems may be needed, there may well be too much explanatory power for the job at hand. A way is needed to constrain the power. Economy of explanation characterizes the scientific endeavor and should be invoked in this branch of science. It is possible that the explanatory power available could be constrained if it were required that each of the many hypothetical causes of reading problems fits a well-worked-out account of the acquisition procedure (p. 3).

At the time Byrne wrote, few papers in the reading literature had attempted the type of integration that he recommended: fitting the empirical research on individual differences into a model of the acquisition process. Most investigators had either focused on developing generic developmental models of stages that all children traverse, or they had concentrated on looking for patterns of correlations in studies of individual differences. The field gradually spawned more of the type of synthesis that Byrne recommended, and the fruitful results can be seen in this volume (see Afflerbach, Chapter 1, for a discussion of the evolution of conceptualizations of individual differences in reading, and Loughlin & Alexander, Chapter 27, for a discussion of the complex relations and interactions of individual differences).

Our own early sporadic attempts at this type of synthesis (Cunningham, 1990; Stanovich, 1986; Stanovich, Cunningham, & Cramer, 1984) proved to us how difficult this type of comprehensively convergent theory was to execute. The 1986 Matthew effects paper did receive flattering attention, but even it confused some readers by moving back and forth between issues of development and issues of individual differences. A decade later, Bast and Reitsma (1998) still thought it was necessary to clarify things. They made a very useful distinction between the *Matthew effect* and the *Matthew effect model*. The former refers to the fan-spread effect on variability with time—that over time, the variability in reading and reading-related cognitive skills increases. The term “fan spread” is not a technical term, but rather a jargon term used in this literature to refer to situations where the variability in a performance metric increases with age. In contrast, as Bast and Reitsma pointed out, a Matthew effect model

attempts to account for these fan-spread effects. The fan spread is, however, simply one component of the Matthew effect phenomenon. The most important feature of the model as proposed by Stanovich (1986) is the underlying developmental pattern that causes the outcome. The phenomenon of increasing achievement differences is hypothesized to be caused by a specific developmental pattern of interrelations between reading skills and other variables.

(Bast & Reitsma, 1998, p. 1373)

The distinction made by Bast and Reitsma (1998) is useful because much of the attention subsequent to the Matthew paper had focused on the fan-spread effect itself, whereas we were always equally concerned with the developmental model, regardless of whether a fan-spread exists for certain skills or not. In short, the issue of reciprocal causation involving reading experience is not totally coextensive with the issue of the fan-spread effect. It is possible for reading experience to be a causal factor in cognitive growth whether or not it is a cause of a fan-spread. For instance, if a student is motivated to read, they will read more frequently. Reading volume is a major factor for the development of vocabulary, facilitating reading comprehension and hence as reading becomes more efficient, levels of print exposure should further increase. In another example highlighting the social emotional aspects of reading, when learning to read comes easily, students often enter into a positive feedback loop leading to feelings of success and competence. This sense of self-efficacy fosters increased interest to explore the worlds of books independently, yielding affective identification as a reader that leads to increased persistence in the face of difficult text. The reminder by Bast and Reitsma to clarify the distinction between the *Matthew effect* and the *Matthew effect model* leads to the second, and related, point of context for the present volume: that the factors affecting the variability in a skill are not necessarily the same factors related to its mean level, as will be discussed below.

Of course, this point is often a caveat to heritability studies of reading and reading-related cognitive skills. It is important to remember that heritability (an individual difference concept)

does not imply lack of malleability (a concept referring to the absolute level of performance). The sometimes confusing difference between when a study is addressing variability in a skill and when a study is discussing the absolute performance level for a particular task can make our literature difficult to read. Being sure to keep the implications drawn from these studies consistent can be a difficult task. Consider an example related to Matthew effects.

Schools create opportunities for learning and for acquiring critical skills and knowledge. But children then proceed to *use* those skills outside of school. The differential reading skills thus acquired enable differential bootstrapping of further vocabulary, knowledge, and cognitive structures outside of school (one of the key points from the 1986 paper). These bootstrapped knowledge bases then create further individual differences that become manifest in differential performance as children grapple with subsequent in-school content and skills. For example, Stanovich (2000) discussed studies finding that the summer period, when the children are not in school, accounts for more of the gap between the high-achieving and low-achieving students than does the period when the children are actually in school. It is important to note though, that this research (showing fan spread over the summer) does not at all contradict the research showing unique effects of the school year on cognitive development (Frazier & Morrison, 1998; Morrison, Alberts, & Griffith, 1997). The latter is focused on the *mean levels* of cognitive skills, whereas the former concerned changes in the *variability*. It is perfectly possible for mean levels of skills to be more affected during the school year rather than the summer and for the summer to be the main cause of the variability in those skills.

One can easily imagine a (simplified) Matthew-like model that could account for such an effect. If during school the cognitive growth of all children is occurring and during the summer the growth for only a subset of children is occurring, then mean levels will be increasing to a greater extent during the school year. However, if the particular children who are displaying growth during the summer are precisely those children who are already reading voraciously (and hence continue to read during the summer) and whose achievement is already at the top of the distribution, then the further growth spawned by the summer reading that these children do will increase overall variance.

In short, when deriving policy implications from studies of reading acquisition and studies of reading difficulties, it is important to keep the domains that we have discussed here clearly differentiated. That is, it is important to be clear when a study has implications for generic models of reading development and when a study has implications for individual differences. Relatedly, many nontargeted educational interventions may be generically efficacious in that they raise the absolute level of performance, but the same educational interventions might well increase the variability among children. In fact, this is the most common finding in educational research (Ceci & Papierno, 2005).

Things that raise everyone's level of performance also tend to be things that make the rich richer—they are generally efficacious in the sense that they help everyone, but they help the advantaged even more than the less advantaged. This is an inconvenient truth of educational psychology. We would like, in fact, to have the opposite. We would like to raise everyone's level but at the same time close achievement gaps, that is, reduce variance in achievement. There are profound philosophical questions raised by the fact that absolute levels of performance and variability are most often positively correlated (Ceci & Papierno, 2005). We will not begin to grapple with these questions until we are clear about the fact that developmental models and absolute levels are conceptually distinct from variability and models of individual differences.

Fortunately, the chapters in this wonderful volume grapple with and begin to address these issues. An impressive array of international scholars have identified and discuss the complex nature of individual differences and their impact on reading and its development in this volume.

Foreword

The reconceptualization of individual differences in reading has broad implications for the field ranging from how we regard the constructs of reading and reading development, the nature of reading curriculum and instruction, the outcomes of effective reading instruction, and assessment and evaluation of students' reading growth and levels of achievement.

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Preface

Individual differences in reading are of interest for research, policy, and practice: the examination of difference across the history of reading research provides a compelling account of how readers vary, and a compelling warrant for continued inquiry. Well over a century ago, William James (1890) notes that individual differences are a key to understanding how people vary in their ability at the same task:

An unlearned carpenter of my acquaintance once said in my hearing: “There is very little difference between one man and another; but what little there is, *is very important.*” This distinction seems to me to go to the root of the matter (p. 24).

This volume is developed in the spirit of honoring the notion that individual differences are, indeed, very important.

There are several purposes to this volume. First, it is intended to provide a representative, state-of-the-art account of the diverse individual differences that are involved in acts of reading, and in students’ reading development. Thirty years ago, Stanovich (1986) proposed the Matthew effect—an explanation of the rapid, even exponential growth exhibited by accomplished student readers. While Stanovich focused on cognitive components of reading, including comprehension and vocabulary, he noted the need for ongoing research to (1) continue to identify relevant individual differences in reading; (2) determine the relationship(s) of individual differences to reading development; and (3) account for interactions among individual differences. The chapters in this volume address developments in each of these areas. The volume also describes the environments in which individual differences in reading may emerge, operate, interact, and change.

The volume is also intended to provide *prima facie* evidence of the benefit of broad conceptualization of the ways in which readers differ. Recent educational policy, influenced by the Report of the National Reading Panel, embodied in the No Child Left Behind legislation, and realized in the Reading First program, focuses narrowly on the cognitive strategies and skills associated with reading. Similarly, high stakes tests at state, national, and international levels reinforce the primacy of reading strategies and skills. While these skills and strategies are requisite for reading development and success (Stanovich, 1986), they do not represent all of readers’ consequential individual differences. Nor do strategy and skill fully explain developing readers’ success or failure. For example, attending to individual differences in students’ self-efficacy or motivation to read can have significant, positive effect.

The lack of comprehensive accounting of individual differences in reading is reflected in the nature of reading programs, the outcomes that are expected from successful teaching and learning, and the manner in which reading development is assessed. It is my hope that this volume contributes to a fuller accounting and appreciation of individual differences in reading, and better understanding of how individual differences matter in students’ reading development.

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Acknowledgments

This volume owes much to my many colleagues in reading. I am particularly grateful to Peter Johnston and Dick Allington—at the beginning of my formal study of reading at the University of Albany, both influenced my thinking about readers who struggle and excel, and the individual differences that feature. At the University of Maryland, my work with Michael Pressley examined the necessity of strategies, and the essential of positive affect for reading success. John Guthrie created compelling instruction at the intersection of cognitive strategies, and motivation and engagement. Patricia Alexander’s model of domain learning allowed for conceptualizing reading development on several trajectories, including the cognitive and affective. Pat also provided important counsel and advice as I developed the prospectus for this volume. P. David Pearson and I presented several research sessions on evolving understandings of individual differences in reading, and these sessions directly informed the development of this volume. The questions, discussions, and projects of undergraduate and graduate students at the University of Maryland have had a beneficial influence on my thinking. Naomi Silverman provided ongoing encouragement, insight, and enthusiasm as the volume progressed. Lastly, I thank each of the authors involved in this project. They undertook this task with insight and vigor that are palpable in each chapter. Their work was a pleasure to read, and to learn from.

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An Overview of Individual Differences in Reading

Research, Policy, and Practice

Peter Afflerbach

In this chapter I describe the promise and challenge related to individual differences in reading. The promise emanates from a continuing interest in identifying individual differences and their origins, and in describing their influence on reading development. The challenge relates to the fact that individual differences in reading are narrowly conceptualized in reading education policy, and in related testing and reading instruction programs. This chapter has two main sections. In the first, I overview central and historic themes in theory and practice related to students' individual differences in reading. I begin with a brief overview of a century's worth of interest in individual differences. I examine attributions made to nature, nurture, or both as sources of difference, and the influence of environments on readers' individual differences. Following, I focus on the distinction between cognitive and affective aspects of individual differences. I then turn to the dynamic nature of individual differences—how they interact, how they influence acts of reading, and how they are influenced by acts of reading. The second section of the chapter describes the disconnection between current understanding of individual differences in reading, and educational policy, testing, and classroom instruction. I describe how individual differences in reading are narrowly conceptualized in consequential legislation and reading curriculum, and the influence of testing on reading policy and practice.

Throughout the chapter, I liberally sample from original sources: I believe the manner in which individual differences have been described across the past century adds to our understanding of the evolution of conceptualizations of these differences. These sources also illustrate the critical links between research and practice that are necessary for identifying and addressing developing student readers' differences.

Ongoing Development of Our Understanding of Individual Differences

Individual differences in how people do things have been a focus of psychology for centuries, and accounts of variation in human behavior are richly told with an individual differences narrative. In 1868, Peirce investigated factors that are shared by “great men,” and that influence

individual's development. Peirce identifies individuals' ancestry and birth order, family background and childhood, physical stature, peculiarities, general health, levels of education, precociousness, work habits, and motivation and drive. He uses the resulting data to theorize the relationships of individuals' differences with their accomplishments. Peirce's work focuses on specific individual differences, including those from the physical, cognitive, affective and social realms. Peirce presages the interest on how individual differences develop, as well as future investigations of their often-complex interactions.

In one of the first investigations of students' individual differences in reading, Theisen (1920) reviews the use of reading test scores to identify differences:

The results of standardized tests have everywhere revealed wide differences in reading ability. They have shown decided variations in such factors as rate of reading, knowledge of vocabulary, ability to gather thought from the printed page, and ability to read orally (p. 560).

With the above observation, Theisen frames students' individual differences in relation to factors that contribute to reading ability. From this perspective, it is possible to designate a student as different, and to specify the difference. Theisen's observation anticipates that across the history of the construct, the conceptualization of individual differences will skew strongly towards reading strategies and skills. Following, Moore (1938) situates individual differences in the classroom, focusing on students' reading development, specifically reading readiness:

readiness involves many different factors in which a typical pupil is unevenly advanced. At the present time we do not know what weight to give to each and every characteristic . . . There are certain causes of individual differences which have received less attention than they seem to deserve. These causes briefly are: (1) variation in intelligence, (2) in sensory equipment, (3) in physical equipment, (4) in language ability, (5) in rate of learning, (6) in response to motivation, (7) in sex, and (8) emotional control (p. 164).

The above list reflects Moore's deconstruction of the reader and identification of areas in which individual differences exist. It is a preliminary proposition that individual differences in reading may result from nature, or nurture, or an interaction of the two. Moore notes that certain "causes" of individual differences receive less attention than others. His list of differences leans decidedly towards organic, "born with" differences such as sensory equipment, physical equipment, and gender. Importantly, Moore notes that individual differences may reside in both cognitive and affective realms.

Moore (1938) is also one of the first to acknowledge that as the identification of individual differences continues, and as descriptions of the array of individual differences in reading are elaborated, this knowledge should be accompanied by a theory of how to "weight" the differences. Determining the role and value of individual differences, and their centrality to reading and reading development, is a work in progress. Moore notes that the lack of theory of how to assign importance to individual differences creates challenge in conceptualizing classroom practice that effectively addresses the differences:

All teachers realize to some degree the range of abilities found in every class group. We know that we can expect to find a range of reading ability of at least three grades from the first to the third and at least five or more grades for pupils in the grades from the third through the eighth grade. Despite these general facts few of us have a definite guiding philosophy as to what should be our attitude towards the differences we know to exist (p. 165).

Attention to individual differences continues. Consider Cunningham and Stanovich's (1998) questions, reflecting decades of inquiry into how readers develop, and how individual differences impact that development:

Given that life-long reading habits are such strong predictors of verbal cognitive growth, what is it that predicts these habits? We've been looking at reading volume as a predictor of reading comprehension and cognitive ability, but what predicts reading volume or avid reading? (p. 146).

The above excerpt reminds that there are many possible relationships between the particular individual differences. Cunningham and Stanovich (1998) further describe how individual differences are situated in and impacted by the instructional environment:

Further exacerbating the problem is the fact that less-skilled readers often find themselves in materials that are too difficult for them . . . The combination of deficient decoding skills, lack of practice, and difficult materials results in unrewarding early reading experiences that lead to less involvement in reading-related activities. . . unrewarding reading experiences multiply; and practice is avoided or merely tolerated without real cognitive involvement (p. 137).

Thus, the study of individual differences and the determination of their obvious or subtle influences on reading are enhanced by consideration of the environments and contexts in which individual differences develop.

The Influences of Nature and Nurture on Individual Differences

How individual differences develop, and their influence on reading, are key questions for research and practice. Artley (1981) suggests that reading development is impacted by a mixture of individual differences emanating from both nature and nurture: they are "inherited and acquired." He describes the need for reading instruction to address these individual differences, as opposed to focusing on imaginary and elusive mean performance targets among children of the same age:

In fact, the history of elementary education during the last 75 years has been concerned in one way or another with ways to cope with the multitude of issues growing out of the fact that children of the same chronological age are different by virtue of their inherited and acquired characteristics (p. 142).

Strang (1961) shares this sentiment, suggesting that individual differences in reading derive from nature and nurture, and from the interactions of students with their reading environments. She introduces a broad array of reader characteristics that can influence both single acts of reading, and an individual's overall reading development. In doing so, she establishes categories for inquiry into individual differences that remain valid to this day:

getting meaning from the printed page is a biopsychological process that is influenced by the individual's ability, his experiences, his needs, his attitudes, his values, and his self-concept. Each individual interacts with the total reading situation in accord with his unique pattern of characteristics. His memory of each experience with reading further influences his perception of, and his response to, each new situation (p. 414).

Strang anticipates the paradigmatic movement from behaviorism to information processing and cognition. She even suggests that students' metacognition (a concept not yet so-named) influences individual differences, with memory of past reading experiences influencing current and future reading acts. She also proposes the mutability of individual differences based on interactions between organisms and their environments (e.g., students in classrooms and in reading groups; Bronfenbrenner, 1979):

Thus, the psychology of reading has become more complex since the early days of the stimulus-response theory. The influence of the individual, his abilities and background, has been inserted between the stimulus and the response; the S-R bond has become the S-O-R bond, or the stimulus-organism-response bond. Moreover, we recognize that the individual does not learn in isolation but is influenced by the complex social network in which he lives and learns (p. 414).

Going forward, an important focus for research is the individual differences that are stable within individuals, and those that are influenced by factors in the reading environment. The dynamics of these differences, how they operate to influence reading and how they influence reading, are deserving of researchers' attention. In addition, the environments in which reading occurs figure largely in how inherent individual differences are accommodated, and in how reading skills and attitudes are nurtured.

Cognition and Affect in the Conceptualization of Individual Differences

Throughout the history of research on individual differences in reading there is a focus on the cognitive (see Cunningham and Stanovich, this volume). Many studies examine individual differences in the systems that support cognition, such as attention, memory and vision. There is also considerable research on individual differences in readers' strategies and skills that are supported by these systems, including phonemic awareness, sound-symbol correspondences, fluency, vocabulary, and comprehension.

In contrast, the study of affect as an individual difference in reading is more recent, and less prevalent in the research literature. Motivation and engagement and self-efficacy are examples of individual differences where thick threads of affect are woven through cognitive operations. In addition, metacognition interacts with affect in reading, as readers build understandings not only of their cognitive operations, but also of their emotional states before, during, and after reading.

Moore (1938) focuses on both cognitive and affective phenomena involved in children's reading test-taking. The following description is notable for the attention given individual differences in affect that are interwoven into the students' experience, and the perennial concerns with the influence of testing on children:

"In testing children in this study the examiners were impressed with the intense effort put forth by most of the children in trying to name or to write letters. The efforts were often painful to observe: sustained frowning, alternate squirming and rigidity of body, pointing tensely, labored breathing, grunting, whispering, and even weeping." Can you not visualize the great variation, the marked difference in the children studied?

(Wilson, cited in Moore, 1938, pp. 163–164)

Hunt also catalogs difference, and student attitude is considered a key individual difference. However, he maintains the focus on cognitive individual differences:

Actually, from the first day of Grade 1, the teacher meets an ever widening range of ability and background. First-grade children differ greatly in their language facility, knowledge of stories, experiences with materials, visual discrimination, general information, and attitudes towards reading and school.

(Hunt, 1952, p. 417)

The skewing of attention towards cognitive individual differences continues to this day. The long-running conversation about the roles, power, and relationships of cognition and affect in learning is often dominated by cognition (e.g., Lazarus, 1984; Zajonc, 1984). This imbalance is reflected in contemporary reading curriculum, instruction, and assessment. Thus, determining and addressing students' individual differences in strategy and skill are common targets of educational policy and reading programs. For example, reading instructional programs contain detailed approaches to teaching sound-symbol correspondences, but lack detailed approaches to helping students develop self-efficacy as readers. Individual differences in student affect often receive less "official" notice, although attending to them is a hallmark of successful teaching (Dolezal Welsh, Pressley, & Vincent, 2003). While research on individual differences in affect is less common than research on cognitive differences, it is rarer still that affect-related research results inform reading policy and large-scale curriculum initiatives.

Individual Differences in Readers Interact and Influence Reading

Individual differences can interact, and their effects can be pronounced or muted.

Strang (1961) describes the intertwining of differences during reading diagnosis, and how these differences may interact to further influence a student's reading development:

The child's responses may be influenced by his anxiety in a strange situation, by his having to say "I don't know" to many questions, and by the depressing sense of failure as the items become harder. Lapses in attention may lower the child's score. Emotional situations and associations may throw him off the track. If he wants very much to read better immediately, he may feel annoyed at not being given instruction in reading. Other interests and sheer fatigue may also influence his responses unfavorably (p. 418).

Strang reminds us that it is not sufficient to identify and address isolate individual differences. Better to best understand how differences interact within the individual. Betts' (1940) observations of student readers experiencing reading frustration are strikingly similar to those noted by Strang, and signal that acts of reading are influenced by affect:

as the typical pupil becomes increasingly frustrated, he may exhibit tension, movements of the body, hands, and feet, he may frown and squint, and he may exhibit other types of emotional behavior characteristic of a frustrated individual (p. 741).

The interaction of readers' individual differences and their influence on reading achievement are famously accounted for in Stanovich's portrayal of Matthew effects in reading (1986; see also Merton, 1968). Conducting a synthesis of research on the development of young readers' cognitive strategies and skills, Stanovich attributes superior reading development to "reciprocal

relationships—situations where the causal connection between reading ability and the efficiency of a cognitive process is bidirectional” (p. 360). When the Matthew effect is operating, the rich get richer. Initial success with reading begets ongoing success: increased reading experience provides more practice with strategies and skills, and prior knowledge accrues as readers encounter new information. All contribute to future reading performance. However, struggling readers experience a related phenomenon: the poor stay poor. We might call this a “reverse Matthew effect.” Initial, and then ongoing, lack of success at reading is related to different individual differences, and can lead students to a cognitive and affective crossroads, with struggles to construct meaning and little or no inclination to try to read:

Readers of differing skill soon diverge in the amount of practice they receive at reading and writing activities. They also have different histories of success, failure, and reward in the context of academic tasks. The long-term effects of such differing histories could act to create other cognitive and behavioral differences between readers of varying skill . . . There is already some evidence suggesting that differences in self-esteem, rather than being the cause of achievement variability, are actually consequences of ability and achievement (p. 373).

Stanovich anchors the Matthew effect to individual differences in cognitive strategies and skills, and domain knowledge. However, the above account acknowledges the influence of differences in affect on students’ reading development, including motivation and self-esteem, and suggests that future investigations focus on both cognition and affect.

Ongoing research contributes to our understanding of the interactions between readers’ individual differences. Consider, for example, research related to readers’ self-efficacy that indicates that an increase in readers’ self-efficacy is often paired with an increase in motivation (McCrudden, Perkins, & Putney, 2005). Higher self-efficacy is related to enhanced reading comprehension and achievement (Solheim, 2011). High achieving students possess high self-efficacy; they make fewer attributions for their performance to external causes that include task difficulty, luck, and teacher help (Shell, Colvin, & Bruning, 1995). Correlational evidence charts the relationship between self-efficacy and epistemic beliefs (Phan, 2008). Following the thread from self-efficacy, epistemic beliefs influence achievement, as they can promote engagement in learning and persistence at challenging tasks (Afflerbach, Cho, & Kim, 2014; Schommer, 1994). Metacognition involves monitoring and evaluating processes that can influence students’ epistemic understanding (Richter & Schmid, 2010), and sophisticated epistemic beliefs lead readers to engage in elaborated metacognitive processes (Pieschl, Stallmann, & Bromme, 2014).

To summarize, there is an ongoing evolution in our understanding of individual differences in reading, and their influences on acts of reading and reading development. Differences exist within individual readers; the provenance of difference may be traced to nature, nurture, or both. Individual differences may be shaped by reading environments, including those in homes and classrooms. Individual differences are evinced in both the cognitive and affective realms of reading, although the historic narrative of readers’ individual differences is dominated by cognition. The dynamic nature of individual differences, their developmental trajectories, and their interactions, are increasingly comprehended. These differences can interact in a manner that is beneficial, or detrimental to reading. As we learn more about the nature and origin of individual differences, we better understand their role in acts of reading, and in reading development. Given this wealth of knowledge about readers’ individual differences, I next focus on how, and if, they are a focus of educational policy and practice.

The Disconnection between Current Understanding of Individual Differences and Reading Policy, Testing, and Instruction

Copious research describes the range and importance of individual differences in reading. Yet, the past decades have witnessed a narrowing of the conceptualization of what is central to students' reading development, as reflected in policy, curriculum, and testing. That this diminution is occurring as our understanding of individual differences in reading expands is not anticipated by a theory of sensible use of research findings. Particular individual differences may be acknowledged, while others are ignored. There are several explanations for the disjuncture between policy and practice, and the research and theory related to individual differences.

The Conceptualization of Individual Differences as Strategy and Skill

Cognitive strategies and skills enjoy privileged status as the most consequential individual differences for students' reading development. The focus on cognitive strategy and skill is ongoing (Afflerbach, Pearson, & Paris, 2008), and is itself influenced by a series of reciprocal relationships. Education policy, reading tests, and reading instruction programs interact to reinforce one another. These interactions result in the maintenance of belief that individual differences in readers' strategies and skills are, at a minimum, the most important differences. In the extreme, strategy and skill are positioned as all that matters for students' reading development and achievement. This contributes to a concomitant lack of attention to other individual differences that influence students' reading development.

The National Reading Panel Report and Individual Differences

In the United States, reading instruction is heavily influenced by the Federal government, and Federal government policy in reading continues to be heavily influenced by the National Reading Panel Report (NRP; National Institute of Child Health and Human Development, 2000). The NRP Report identifies five cognitive strategy and skill areas in which students vary, and a selective synthesis of research leads the NRP to conclude that phonemic awareness, phonics, fluency, vocabulary, and comprehension must be the focus of reading instruction. The NRP describes the five strategies and skills identified as:

instructional topics of widespread interest in the field of reading education that have been articulated in a wide range of theories, research studies, instructional programs, curricula, assessments, and educational policies. The Panel elected to examine these and subordinate questions because *they currently reflect the central issues in reading instruction and reading achievement.*

(Retrieved from http://www.nichd.nih.gov/publications/nrp/upload/smallbook_pdf.pdf, p. 3; italics added)

The corollary conclusion of the NRP Report for reading policy, instruction, and assessment is this: individual differences in reading strategies and skills explain the differences between successful and struggling readers.

This conclusion could be anticipated by the criteria for reading research used for inclusion in the NRP Report:

To be included in the database, studies had to measure reading as an outcome. Reading was defined to include several behaviors such as the following: reading real words in isolation or in context, reading pseudowords that can be pronounced but have no meaning, reading text aloud or silently, and comprehending text that is read silently or orally (p. 5).

The above “measure of reading as an outcome” has exclusive focus on cognitive strategies and skills, and is accomplished using tests. Reading research that is included in the NRP features tests for statistically significant differences that derive from comparisons of treatment and control groups’ test scores. The test scores are a measure of students’ cognitive strategies and skills, such as oral reading fluency or reading comprehension.

Thus, consideration of readers and their individual differences by the NRP is restricted by the nature of the outcomes assessed: Research studies that examine a student’s performance at pronouncing pseudowords and real words in isolation are included, but other outcomes that are demonstrably powerful and necessary for successful reading, such as the development and maintenance of student readers’ self-efficacy and motivation, are ignored. Research on reading development and related individual differences that does not include tests of cognitive strategy and skill is not included in the report of the NRP.

In effect, the NRP approach to research synthesis eliminates from consideration a considerable amount of reading research. Among the “un-included” research is that which focuses on individual differences other than strategy and skill. The NRP did express concerns with how the NRP Report might be interpreted. In particular, the NRP did not want “missing” aspects of reading to be assigned secondary or tertiary importance, in policy or practice. Thus, it included the following caveat: “The Panel’s silence on other topics should not be interpreted as indicating that other topics have no importance or that improvement in those areas would not lead to greater reading achievement” (p. 3). However, this is just what transpires as the US Department of Education uses the NRP Report to develop reading education policy. As often happens when research syntheses migrate to policy makers’ desks, there is a loss in translation. The naming of five sets of cognitive strategies and skills has the result of significantly reduced attention to other aspects of reading development and achievement, and their related individual differences.

Reading Instruction and Student Reading Development Based on “Scientific Evidence”

In accordance with No Child Left Behind and Reading First initiatives, states applying for Reading First grants are required to purchase reading instruction materials that are based on “scientific evidence” from reading research. Few would argue against reading programs being based on proven instructional approaches that address students’ specific reading needs. However, Federal law guarantees that the “scientific evidence” undergirding effective reading programs is reading test scores. Reading programs are determined to be effective when they are based on research that finds statistically significant differences between experimental treatment and control group learning outcomes. The dependent variables in this research are reading test scores—a proxy for students’ cognitive strategy and skill use. The use of test scores to deem particular reading instruction programs acceptable mimics the NRP’s use of test scores to certify cognitive strategy and skill research as the guide to fostering students’ reading development.

“Acceptable” reading instruction programs focus on the “big 5” of phonemic awareness, phonics, fluency, vocabulary, and comprehension, and individual differences in student growth in these strategies and skills is measured by tests.

In addition to being the basis for privileging particular individual differences within reading programs, tests of cognitive strategy and skill are the primary measure of school-wide achievement. In the United States, whether or not students and schools are making adequate yearly progress (AYP) is determined each year in grades 3 through 8 using test scores. Again, these scores represent reading progress as strategy and skill development. There are no standardized tests scores for positive student reading affect, effective metacognition, higher order thinking, growth in self-efficacy, or for a student’s turn towards intrinsic, positive motivation to read. To reiterate, test scores are the currency that buy reading research and reading programs using the labels “important” and “evidence based,” respectively. Under this regime, individual differences that are not tested are considered less salient to reading development than the cognitive strategies and skills that are tested.

This phenomenon is not restricted to a particular country—international comparisons of students’ reading and literacy achievement, including the Program for International Student Assessment (PISA; Organization for Economic Cooperation and Development, 2014) and Progress in International Reading Literacy Study (PIRLS; International Association for the Evaluation of Educational Achievement, 2011) also employ tests whose items predominantly sample the strategy and skill domain of reading.

However, there may be cause for cautious optimism. PIRLS (2011) includes a questionnaire that focuses on differences in students’ habits and emotions related to reading. In the following, students rate on a continuum from “Agree a lot” to “Disagree a lot”:

- I read only if I have to
- I like talking about what I read with other people
- I would be happy if someone gave me a book as a present
- I think reading is boring
- I would like to have more time for reading
- I enjoy reading

(Retrieved from: http://nces.ed.gov/Surveys/PIRLS/pdf/P11_Student%20Q_USA_final.pdf)

The results from such questionnaires and rating tasks are classified as “background information,” but it is encouraging that high stakes, international tests are acknowledging the importance of these aspects of reading development. In the meantime, as students are compared across countries, test scores focus on strategy and skill, and describe a nation’s educational standing, school accountability, teacher quality, and student growth (Afflerbach, 2002). That test scores represent a narrow range of both learning outcomes and students’ individual differences in reading should be incentive to change current assessments.

A recent initiative with major influence on both curriculum and assessment is the Common Core State Standards. The English/Language Arts Standards (ELA: National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010) describe increasingly complex cognitive outcomes that are expected from students as they matriculate across grades. The affiliated assessment consortia, Smarter Balanced Assessment Consortium (SBAC) and Partnership for Assessment of Readiness for College and Careers (PARCC), produce tests with exclusive focus on cognitive strategy, skill, and content area knowledge gain.

Thus, testing practices continue to reinforce the idea that cognitive strategy and skill are the individual differences that matter most, often to the exclusion of other individual differences, which related research describes as powerful.

Additional factors operate to bolster a narrow conceptualization of individual differences in reading. Economists use the term *path dependence* to describe how particular social and educational practices maintain, even in the face of suitable, valid alternatives. McDonnell (2008) defines path dependence as follows: “Major social policies create networks of vested interests that benefit from a policy and that develop operational rules and structures to protect it from political attacks and attempts to alter it” (p. 52). There are vested interests that are content with maintaining the status quo focus on strategies and skills as the individual differences that matter. Education publishing companies and testing companies are examples of these “vested interests”: their profits within the current system amount to billions of dollars each year. Robust sales of reading programs and reading tests depend on reading development, and attending individual differences, being conceptualized as strategy and skill building.

A final example of the pervasive influence of testing on how learning, educational outcomes, and individual differences may be conceptualized comes from Alexander, James, and Glaser (1987). In reviewing the results of the National Assessment of Educational Progress, they observe the following: “And so, unfortunately, we are apt to measure what we can, and eventually come to value what is measured over what is left unmeasured. The shift is subtle and occurs gradually” (p. 23). If the above proposal of coming “to value what is measured over what is left unmeasured” is accurate, then advocating for changes in reading tests to include a more realistic array of students’ individual differences is a considerable challenge going forward.

Individual Differences in Reading: Looking Ahead

Research continues to inform us of the diversity of individual differences in reading, their importance to reading theory, and their contributions to students’ reading development. In 1986, Stanovich commented on his preliminary account of individual differences: “The review is not so much a complete model of the development of individual differences as an outline to be filled in by future research” (p. 395). This volume demonstrates that considerable work is being done to “fill in” our understanding, in terms of the range of individual differences that impact reading development, and the detailed descriptions of these differences. While Stanovich focuses on the cognitive work that readers do, we are now privy to research that describes a range of cognitive and affective individual differences. In addition, we have growing understanding of the provenance of individual differences, their interactions, and the relationship between instruction and reading environments and the development of these differences. The chapters that follow describe how individual differences “fit” with reading theory, and have important implications for theory and practice. In addition, the volume describes the social milieu in which classes of individual differences are created and valued.

It is one thing to build and test detailed theories of individual differences, and another to implement practice based on these details. A reconceptualization of individual differences in reading is not worth much to children who lack phonics skills and motivation to read, but whose related classroom experience is limited to skill instruction. Addressing an increased array of individual differences in reading complexifies teaching. Consider zones of proximal development (Vygotsky, 1978), across which a talented teacher guides students. Scaffolded reading strategy instruction commonly helps students in one such traverse. What else matters in a student’s reading development? What is the equivalent of strategy instruction for crucial aspects of an individual student’s reading growth, including the development of a student’s self-efficacy,

motivation and engagement, and higher order thinking? Research of the individual differences in reading helps answer these questions.

Understanding the broad array of individual differences that exist in every reader, and learning how they operate for each of our students is critical work. Strang (1961) notes: “In view of the complexity of the reading process and in view of individual differences in response to teaching methods, should we not be more concerned with the flexible use of methods and the combination of the best features of several methods?” (p. 427).

The scholars cited throughout this chapter provide insights that demonstrate that awareness of individual differences, and suitably addressing them in the classroom is ongoing work. Returning to Moore (1938), we consider the perennial conflict of broadly conceptualizing individual readers and their differences, while being restricted by narrowly-bounded instructional systems: “The significance of individual differences challenges as never before the best efforts of all teachers in this day of inadequately developed averages, norms, and standards” (p. 166). The breadth of theory of individual differences that is now explicated might be a pleasant surprise for Moore, but he would be fully familiar with the need to move from research-based theory to effective reading instruction practice.

In closing, I trust that the chapters in this volume represent progress based on Stanovich’s (1986) forward-looking observation for research and theory on individual differences in reading: “Many of the hypotheses to be advanced are quite tentative, as the empirical evidence relating to several of them is far from definitive” (p. 365). Over the last 30 years, tentative hypotheses regarding individual differences in reading have been tested, challenged, and revised. Additional areas of difference have been identified, accompanied by efforts to determine their central or ancillary influence on reading development. The needed work of reconceptualizing individual differences in reading and considering their implications for practice continues, as informed by the reading research presented in this volume.

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Identifying Individual Differences in Reading

What Are We Looking For?

Emily Fox and Liliana Maggioni

Statement of the Problem

The aim of this chapter is to encourage a conversation about what we as a field are looking for in investigating individual differences in reading. Initiating such a conversation requires somewhat of a bird's-eye view of what has been done and is being done in the way of research. However, the research on individual differences in reading has been tremendously prolific—as shown by the need for an entire handbook devoted to discussing such research. Therefore, we will use examples to illustrate what we see as important patterns and influences related to individual differences, but do not here carry out a systematic review or analysis.

We initially consider the investigation of individual differences by psychologists and educational researchers on a broad scale as a way to lay out the basics of the general territory within which we will be operating and to establish a context within which to explore the possibilities for reading research. How, in general, are researchers' aims structured when investigating individual differences, and from what fundamental assumptions do they originate? We turned to disciplinary reference works in order to get a general sense of the possible approaches to research on individual differences, specifically, to the entries on "Individual Differences" in encyclopedias of psychology and behavioral science (Breslin, 2004), education (Corno, 2003; Ho, Tomlinson, & Whipple, 2003; Kyllonen & Gitomer, 2003), human development (Reeve, 2006), cognitive science (Lubinski & Webb, 2005), industrial and organizational psychology (Webb & Lubinski, 2007), social psychology (McCrae, 2007), and educational psychology (Magliano & Perry, 2008).

In general, the study of individual differences is interested in understanding how differences in human characteristics are related to important differences in human behaviors and life outcomes. From the social psychologist's point of view, for example, individual differences are "enduring psychological features that contribute to the shaping of behavior and to each individual's sense of self" (McCrae, 2007). The larger purpose of studying individual differences is typically seen as being able to optimize the potential of the individual through being able to predict key life outcomes, such as job satisfaction, and through meeting the educational, occupational, or

therapeutic needs of the individual so far as possible, by providing appropriate training, remediation, or opportunities. For educational and developmental purposes, there tends to be more emphasis on remediation and addressing issues of inequity, with the goal of achieving “a shared standard of excellence” (Ho et al., 2003) or providing “equal rights and opportunities” (Reeve, 2006) for all students, rather than fulfillment of individual potential.

With regard to fundamental assumptions that appear to shape studies of individual differences in general, the characteristics considered of interest are usually classified under three broad areas of human functioning: cognition (primarily intelligence); affect/ personality/ temperament; and conation (motivation and volition). Some diversity is found in the characterizations of these realms, particularly for the affective and conative areas, and particularly with regard to the role of interests or preferences, beliefs, and values.

At the same time, however, in the overviews of individual difference research presented in the various encyclopedias, a consistent point of emphasis is the fundamental overlap and interdependency among these constructs, so that, for example, “For some purposes, affective and conative processes have proven to be so interconnected that it makes little sense even to psychologists to separate them” (Corno, 2003, p. 1119). These interconnections produce profiles and patterns in the relations of characteristics and behaviors seen:

Although each of the major classes of individual differences—cognitive abilities, preferences, and personality—has traditionally been examined in isolation from the other two, these classes are not independent. Cognitive abilities, preferences, and personality traits tend to covary systematically to create constellations of personal attributes, and these complexes have interdependent developmental implications.

(Webb & Lubinski, 2007)

The viewpoint regarding the stability of individual differences is twofold. On the one hand, they are considered as relatively stable abilities, traits, or dispositions inherent in the person (who is typically assumed to be an adult); on the other hand, particularly when considering human development and education, certain types of individual differences are viewed as more potentially malleable, arising from or interacting significantly with environmental features or influences. In general, though, the need to consider the contribution of the interaction of the individual and the situation is also acknowledged when measuring individual differences and interpreting their likely meaning or impact with regard to outcomes of interest. In general, it is also emphasized that most people fall somewhere in the middle of the range for typical individual difference variables—true outliers on most individual difference characteristics of interest (intellect, personality, temperament, motivation, volition) are rare.

Now, having briefly overviewed the territory covered in investigations of individual differences with regard to their aims and assumptions, what do we see as the possibilities that are open to us for thinking about individual differences in relation to reading? We would like to be able to understand how and why readers differ in terms of the entire range of aspects—cognitive, affective, and conative—that matter for what they do in the way of reading. We would like to have a better understanding of how individuals develop as readers, from the earliest stages of acquisition on up to being able to read to accomplish valued and self-chosen goals as adults, and to get a better grasp on what would help us to predict their different developmental paths. We are also interested in investigating the differential success of different individuals in accomplishing particular reading-related tasks and how they may respond in particular reading situations. It would be important to be able get a sense of why different individuals choose to

engage in different reading behaviors, for which we will also need to know about how they think of themselves as readers and what they think reading is. Finally, we would like to know how reading itself helps shape development and can itself become a source of individuation and variability in the characteristics and identity of the individual reader.

The investigation of individual differences enables us to go after such understandings, which should then support our being able to intervene in appropriate and helpful ways, whether we are aiming at fulfilling potential or equalizing opportunities. However, how do we know which individual differences and constellations of individual differences will provide productive explanatory avenues for investigation? And how well do the various avenues that have been taken in the research so far come together into a story about readers and how they may differ in ways that matter?

Investigating Individual Differences in Reading

Investigations of individual differences in reading have primarily been based on a few overarching models of reading processes and early reading development. They have addressed how such individual differences influence the (primarily cognitive) processes and products of reading, as well as differences in the development of the skills and capabilities required for executing those reading processes. The guiding purpose has been, on the whole, to gain understandings that can allow us to help struggling readers (Magliano & Perry, 2008).

Because of this focus on struggling readers, considerable attention has been given to individual differences related to entry-level reading processes and reading acquisition. This line of research has relied on a few key stories and motifs about what matters in learning to read, including Stanovich's highly influential review on Matthew effects in reading (1986), the simple view of reading forwarded by Gough and Tunmer (1986), and Perfetti's body of work on word identification and lexical quality (2007). Its major aim has been to parse out the contributions of various individual difference variables in predicting initial success in word reading, and sometimes also later success in reading comprehension. Potential variables of interest have typically included general cognitive ability, verbal ability (including receptive vocabulary), working memory, phonological awareness and skills, speech perception and production, knowledge of letter names, and rapid automatized naming (Bowey, 2005). Another intersecting line of research has considered the role of early environmental influences in children's differential literacy development, building upon such work as Clay's (1989) on the importance of young children's concepts of print that develop from their initial contacts with books, and Hart and Risley's (1995) foundational work on the role of the language use in the home environment in young children's vocabulary development.

Beyond these inquiries into individual differences and their relation to students' entry-level reading, the field has also taken up the investigation of differences in reading at the level of text comprehension and learning from text (e.g., Johnston, Barnes, & Desrochers, 2008). Among the important stories about individual differences in reading processes and products at this level are Kintsch's construction-integration model of reading comprehension (1998) and van den Broek's landscape model (van den Broek, Risden, Fletcher, & Thurlow, 1996). These are both information-processing based accounts of what goes on during and results from reading, and in both of them the reader is assumed to be constructing a mental representation of what the text "says." In these models, crucial individual difference variables related to reading processes and products at the level of text comprehension include relevant background knowledge for text topic(s), attentional resources, reading strategies or language skills, decoding skills, and, for the

landscape model, the reader's own standards for coherence of the mental representation constructed. Guthrie and Wigfield (1999) built upon this view of reading comprehension as involving the construction of mental representations in their motivational-cognitive model of reading, incorporating additional motivational processes as well as the primarily cognitive aspects identified in the information-processing accounts. With motivation and engagement in the picture, additional potential individual difference variables related to reading processes and outcomes at the level of text comprehension emerge, among them interest in the text and in the activity of reading, task mastery goals, self-efficacy, and beliefs about the nature of reading (e.g., Anmarkrud & Bråten, 2009).

At the level of text comprehension, it appears that some of the potential individual difference variables being considered (such as working memory or vocabulary size) are more inherent in the person, while others (such as relevant background knowledge or topic interest) involve the interaction of the person's characteristics and the features of the reading situation. A highly influential report from the RAND Reading Study Group (RRSG, 2002) on reading comprehension characterized interaction as an essential attribute of reading comprehension, identifying the interacting components as reader, text, and activity, all nested within and interacting as well with the surrounding sociocultural context. Individual differences thought to be important sources of variability within this more comprehensive account of reading comprehension are wider ranging. They include fluency of word recognition, vocabulary and linguistic knowledge, a suite of non-linguistic cognitive abilities and processes (e.g., attention, working memory, visualization), engagement and motivation, understanding of the purposes of reading, discourse knowledge, domain knowledge related to the text, level of cognitive and metacognitive strategy development, and beliefs about personal reading competence (RRSG, 2002, p. 22). In keeping with their interactive view of reading comprehension, the RRSG also noted that these conjoined variables may operate differently in different reading situations:

Thus, patterns of strength or weakness in the domains of word-reading accuracy, fluency, comprehension strategies, vocabulary, domain knowledge, interest, and motivation can lead to performances that vary as a function of the text and of the task being engaged in. (p. 24)

The RAND report (RRSG, 2002) laid out an ambitious program of research on reading comprehension, including research on the general and situation-specific roles of the entire set of cognitive, affective, and conative individual difference variables outlined. The purpose was to develop reading instruction and reading assessments that can foster proficient (adult) reading by supporting the progress of at-risk (young) readers, where proficient reading is precisely that reading that is cross-situationally successful and does not falter with different tasks or in different situations. However, the developmental trajectory from beginning to proficient reading is not entirely clear, and the bulk of the emphasis remained on getting the young reader successfully started with comprehending and learning from texts, both in and out of school.

Lifespan models of reading development support a more integrated understanding of the different pathways that different types of readers take as they progress beyond beginning reading, or of why they respond in different ways in different reading situations. Chall (1983) outlined stages of reading development, each with their particular demands on the developing reader in terms of the nature of the reading being done, and therefore entailing the consideration of both inter- and intra-individual differences across time. Because her story was a normative one, her focus was not on identifying key ways that individuals can vary inter-individually, and

she tended to speak rather generally of cognitive and language abilities as underpinning differences between individual readers. However, in identifying the critical shifts in the type of reading being done, she also mapped out the additional critical variables expected to contribute to success at each new type of reading.

The aspect of her story that has received the most attention and has been taken up into the discourse is the transition in elementary school from “learning to read” to “reading to learn,” which is thought to be a major potential stumbling-block for struggling readers of a variety of types. This idea that “learning to read” is finished in elementary school is an unfortunate legacy of Chall’s account of the stages of reading development. In fact, her developmental story goes well beyond that point. By Stage 5 (which she was not sure that many people could achieve), the type of reading being done demands “synthesis, reorganization, and critical reaction to what is being read in often difficult and contradictory texts” (1983, p. 51). Such reading requires “broad knowledge of the content that one will be reading at Stage 5, high efficiency in reading, personal courage, daring, confidence, and humility” (p. 52), as well as a full understanding and acceptance of what is at stake in reading in this way.

Another lifespan developmental model centers directly on individual difference variables, considering the contributions they make to success at reading at different stages of reading development. Alexander’s (2006) model of reading development maps out the trajectory of reading development in terms of linked changes in the reader’s knowledge, interest, and strategic processing, with these variables considered in relation to both the domain of reading and also the academic domains within which reading in academic contexts occurs. In her model, the reader’s approach to reading, engagement in reading, and ability to construct coherent meaning and build knowledge from text will vary depending on where the reader is positioned with regard to these key variables. Efficiency in basic reading processes such as word identification, referent matching, and drawing of local bridging inferences (and the supporting reader characteristics or abilities required for this) is encompassed primarily in the strategic processing variable, where strategic processing is effortful, deliberate, and consumes attentional resources, whereas automated, efficient processing is not. Work at higher-level meaning-building processing is better able to happen when lower-level processing such as word identification or grasp of literal meaning occurs automatically (and therefore not via strategic processing). Different reader profiles associated with differential likelihood of success across reading situations are generated by different combinations of strengths or weaknesses in knowledge, interest, and strategic processing (e.g., Fox, Dinsmore, Maggioni, & Alexander, 2009).

Focusing on Cognitive Processes

These lifespan models and the scope of the research program outlined in the RAND report, along with the expansion into motivational territory with the motivational–cognitive model of Guthrie and Wigfield (1999), seem to open up at least the potential for investigation of many of our questions of interest regarding individual differences in reading. However, although the lifespan models and the view of reading comprehension presented in the RAND report do open up space for investigation of individual differences in affective and conative characteristics as important for reading, the research has concentrated primarily on cognitive processes and the proficiencies they require. For example, the entry on “Individual Differences” in the *Encyclopedia of Educational Psychology* (Magliano & Perry, 2008) presents an information-processing-based discussion of the reading process that addresses exclusively cognitive and cognition-related contributors to reading processes and products. Stanovich (2009) has distinguished reflective,

algorithmic, and autonomous processes in thinking and called for more attention to incorporating measurement of the reflective processes into our investigations of important differences in human intelligence. In considering the research on individual differences in reading, it appears that just as with the research on intelligence, the bulk of the attention has gone to potential individual differences in the relatively impersonal autonomous and algorithmic processes, and much less to those in which it matters who the person is as well as what his or her processing capabilities and proficiencies are.

Research on individual differences in reading has a strong focus on reading acquisition and the move into reading to learn, as well as, understandably, an emphasis on identification of factors contributing to or associated with reading difficulties and disabilities (Magliano & Perry, 2008). Although it is acknowledged that just getting children started successfully with reading does not guarantee their later success in the types of reading they will need to do in school or in their lives, the developmental and contextual range of much of the individual difference research in reading is quite constricted, especially for the research on reading development (Fox & Alexander, 2011). We seem to be very far from a view of reading as a necessary and valued part of people's lives at all ages, a behavior in which they can choose to engage in a wide variety of situations, for a wide variety of purposes, and with a wide variety of types of texts.

In general, the story that has been told in the research also relies upon a somewhat artificial compartmentalization of various more or less theoretically distinct (but certainly not independent) categories of possible differences between (or more rarely, within) readers. Each separate category tends to become its own center of gravity, and variations in how to operationalize its possible aspects and in which readers to measure them for which level of reading become important issues (e.g., Melby-Lervag, Lyster, & Hulme, 2012). As a consequence, there is more than enough material to justify separate chapters in this handbook on the contributions to individual differences in reading performance for each of these types of variables: memory; perception; attention; phonemic awareness; word identification; fluency; vocabulary; prior knowledge; metacognition; engagement and motivation; self-efficacy, agency, and volition; self-esteem and self-concept; epistemic beliefs; and higher-order thinking.

The story about individual differences in reading at this point has become an almost wholly quantitative story about different inputs into or modulators of the reading process (e.g., Savage, Pillay, & Melidona, 2007; Warmington & Hulme, 2012; Was, 2010). When the process and its development become the core concern, the reader's characteristics or proficiencies become disconnected from the reader and become objects of study in their own right; we are investigating individual differences in the reading process, but disembodied, in a sense, from the individual readers.

Finally, there is often a sense of sampling from a menu of possible factors and types of reading-related proficiencies, but without a strong underlying coherence or shape to the story that is being told across studies. The individual differences that are being singled out and then brought together to determine their relative value as predictors or contributors to development of a particular form of reading performance (typically a standardized assessment of comprehension, word identification, or both) can have a somewhat arbitrary and generic character, plugging in one or more verbal ability variables, one or more phonetic processing-related or decoding-related variables (occasionally a motivation- or volition-related variable), and so forth, in order to account for the different types of processing thought to make up reading. It is typical to see a battery of assessments, such as in the study by Berninger and colleagues (2006), of different possible paths for development of reading comprehension by at-risk young readers. They measured children's verbal IQ, word identification, word attack, passage comprehension (cloze, recall, and inferential tasks), oral reading fluency, oral reading accuracy, sentence comprehension,

working memory span, and rapid automatized naming of letters. It becomes difficult to bring together what is learned about individual differences in reading across studies because of variations in what is measured and how it is measured (Johnston et al., 2008).

Our stories about even just the cognitive-processing aspects of the multiple levels of the reading process have become so involved that adding on additional layers presents an extremely difficult methodological, analytic, and theoretical challenge (Fox & Alexander, 2009). This means that the interactive and layered nature of the processing-related, motivational, and contextual contributors to what a given reader does in a given situation is often not taken into account. As Schatschneider and Petscher (2011) noted in their chapter on statistical modeling in literacy research:

In studying literacy, it would be almost impossible for a researcher to collect observations on all the biological, cognitive, social, emotional, and environmental influences on reading behavior, even though most literacy researchers would acknowledge the importance of all these areas. (p. 63)

The meanings of the constructs that we do choose to measure do not, therefore, always have a happy home within a clearly articulated theoretical framework binding together the different roles these multiple types of variables play in contributing to individual differences in reading for the different kinds of readers and reading we want to know about.

Centering Consideration of Individual Differences on the Reader

Given the identified possibilities for research on individual differences in reading and our framing of the current situation, we now consider what we could be doing differently. In our view, there are many interesting and relevant questions that are not being addressed, and the ways in which other questions are being addressed may not be building effectively toward a coherent and satisfying understanding of how individual readers differ in important reading-related ways. In a famous essay on Tolstoy, Isaiah Berlin (1951/2013) gave us the contrast between the hedgehog and the fox as a way to represent important differences in how to understand the world, with the hedgehog knowing one big thing, while the fox knows many things:

For there exists a great chasm between those, on one side, who relate everything to a single central vision, one system, less or more coherent or articulate, in terms of which they understand, think and feel—a single, universal, organising principle in terms of which alone all that they are and say has significance—and on the other side, those who pursue many ends, often unrelated and even contradictory, connected, if at all, only in some de facto way, for some psychological or physiological cause, related to no moral or aesthetic principle (p. 2).

This dichotomy seems highly relevant for the situation we have described with regard to how individual differences in reading are conceptualized for investigation. We are looking for knowledge of many things, which means that we are missing perhaps the larger story within which they all make sense.

Our intuition is that one way to unify the work that is being done on individual differences in reading and to be able to get at important questions that are now put aside or seem out of reach is for us to re-position ourselves more on the side of the hedgehog than the fox. And our suggestion along these lines is to re-cast this enterprise as essentially one of understanding

individual differences in *readers*, rather than in the reading process. We suggest that the reader should be at the center of the story, as the binding construct from which our investigations and questions should begin and to which they should return. Taking reading as the essentially complex communicative behavior of a person interacting with a text rather than as a disassembled set of processes or forces (motivational, affective, psycho-physical, cognitive, contextual, and so forth) means that we begin from an undeniably unified phenomenon, in the person of the reader who is incorporating the activity of reading into his or her life (Fox & Alexander, 2011). Such a unified view would support the articulation of a coherent theoretical rationale for which aspects of the reader to foreground in a particular investigation, as well as providing a home for the findings of each investigation within a well-structured and continually more fleshed-out story about interesting differences between and within readers.

An excellent example of framing a story about the nature of reading around the reader as its center and the type of insights and possibilities such a stance can generate is provided in the lifelong work of William Gray. From his earliest forays into outlining a theory of reading development (e.g., Gray, 1925), he included reading attitudes, habits, skills, and tastes as relevant to reading development, along with readers' awareness of different reading purposes. He highlighted the linking in reading of cognition, motivation, communicativeness, purposefulness, and transformative power, as well as the role of reading in the larger social context. In a later work, Gray (1951) explicitly incorporated cognitive, physical, developmental, attitudinal, and motivational factors, along with environment and context, as affecting growth in reading, all as bound up together in the person of the reader:

In the final analysis, progress in reading is determined by the interests and needs of the individual learner. Here many factors are involved: the reader's background; his capacity to learn; his physical, mental, and emotional status; his interests, motives, and drives; his immediate and oncoming developmental needs; his biases, prejudices, and preconceptions; and his home and community environment . . . In other words, growth in reading is influenced by the total development of a child and by all the factors that promote it. (p. 434)

Gray did not consider just the childhood aspect of reading development, but also thought it crucial to understand what later stages of reading development would involve for the reader. In their study of maturity in reading, Gray and Rogers (1956) worked to identify the specific characteristics of the fully mature reader from a theoretical and empirical standpoint. They found that mature readers find reading to be an essential part of their daily lives, they are strongly aware of the contribution of reading to their personal growth as individuals, as learners, and as socially aware citizens, and they choose reading material that supports growth in these aspects.

In looking back to Gray's work as an example of what we see as the viability and potential of centering on the reader, we are not seeking to be regressive or reactionary, and we are not inspired by nostalgia. We do not advocate dismissal of what has been learned so far by focusing on the reading process, but at the same time we would suggest that it could be quite profitable to take into account in addition what had been learned before that by focusing on the reader. One way to consider what it means to have developed a better understanding of a phenomenon is to look at the degree to which a previously undifferentiated and inclusive whole has become complex and specific (Marton & Booth, 1997). The proposed shift in perspective on studying individual differences in reading is a return to a view of reading as a whole, that is, as the behavior of a reader. However, it can be seen as a whole that is becoming increasingly differentiated through the efforts of researchers who have concentrated on parts or aspects of that whole

(Alexander & Fox, 2013; Fox & Alexander, 2009). We do not necessarily need to let go of the many things we know, as long as we can understand them as embedded in and radiating from the core phenomenon that gives them their meaning; that is, the reader and what the reader does. In one of their early articles on the construction–integration model, Kintsch and van Dijk (1978) argued that only the decomposition of the comprehension process would enable us to study it effectively:

If it were not possible to separate aspects of the total comprehension process for study, our enterprise would be futile. We believe, however, that the comprehension process can be decomposed into components, some of which may be manageable at present, while others can be put aside until later. (p. 364)

We are suggesting that perhaps now the time has come to recompose the comprehension process (and the other levels of reading) by putting it back within the reader.

Our argument so far has been that one important benefit of centering on the reader is unification; another important shift that this entails is that what is at the center of our stories is now a person. This person, the reader, reads as part of what he or she does, in the consciousness of who he or she is, as an expression of his or her values, beliefs, and goals. Being a reader can be a significant thread in an individual's identity and lifelong project of identity development (Athey, 1985). Identity as a reader also includes knowledge of one's own tastes and interests, and possibly also of the limits of one's knowledge, tastes, and interests; the mature reader, in Gray's description, is "keenly aware of his own dominant interests, beliefs, hopes, and biases" (1954, p. 397). These aspects of the individual's sense of identity as a reader play a role in the types of reading situations entered into and in the stance the reader takes within those situations (e.g., Schutte & Malouff, 2007).

Centering on the reader and considering reading as a complex communicative behavior not only brings the person of the reader into the spotlight, it means that we must look and see the other person involved here, the one with whom the reader is communicating. Bringing the reader into the heart of our story also entails acknowledging the presence of the author. Just as we do not have a reading process operating on its own, we similarly do not have texts that occur spontaneously and present themselves to be processed. The reader chooses to read in a certain way and for a certain purpose what the author has chosen to write in a certain way and for a certain purpose. Orienting our understanding of what the reader is doing in reading around this idea of an interaction with the text as the product of an author gives us a very different place to stand, and a much more powerful story about what different readers do and understand than that provided by the machinery of text processing (Alexander et al., 2011).

This perspective thus positions our thinking as beginning with the reader and acknowledging the author, positioning reading as a fundamentally human act, a complex and integrated phenomenon within which particular perceptual, physiological, cognitive, motivational, social, contextual strands or combinations thereof might then be foregrounded and traced. We anticipate that starting from the reader and taking reading as the reader's intentional, complex, communicative behavior involving derivation of meaning from presented text (Fox & Alexander, 2011) will construct a space for discourse within which it is appropriate to consider both observational and experiential orientations toward the reader and to use both quantitative and qualitative descriptions. Such a stance should support conceptualization of what readers do in reading as both context-specific and consistent, permit aiming both at discovering relations between variables and at determining the meanings of the variables, and enable direction of research toward both explanatory and emancipatory applications (Marton & Svensson, 1979).

We will then be looking essentially at what the reader does when reading, and our stories about the individual differences involved can radiate out from that center in many different directions without losing their ability to connect to each other.

At the same time, once the reader is placed at the center of our inquiries, the essential complexity of the phenomenon observed cannot be dismissed nor disguised. In other words, putting the reading process back into the reader cannot be likened to linking together the pieces of a jigsaw, because the very shape of each piece now comes to be defined only in relation to the other parts and to the whole. Perhaps this is why following in the footsteps of the fox and trying to address the complexity by dissolving it into an assembly of discrete factors does not seem to have produced satisfying explanations of differences in reading. Far from being an issue relevant only to the topic of this chapter, this problem affects most social sciences inquiries, so much so that we have found the reflections of a well-known economist very relevant to the shift in perspective we are advocating here.

In his speech accepting the 1974 Nobel Prize for economics, von Hayek observed that the complexity that characterizes most of the structures studied by the social sciences is not limited to the quantifiable characteristics of the individual elements that compose them or to the frequency of their manifestation; rather, their complexity essentially derives from the relations among these individual factors. As Gray observed in regard to reading, “its growth is influenced by the total development of a child and by all the factors that promote it” (1951, p. 434).

The consequence of such a state of affairs is the impossibility of predicting specific outcomes without knowing the values of *all* of the relevant factors characterizing the complex phenomenon. If this were the case, what would be the value of trying to study individual components of the reading process? From a predictive perspective, such an attempt would necessarily be inadequate and might well produce results that do not reflect the individual experiences of diverse readers. Our other option is to follow von Hayek and let go of the idea that only the quantitatively measurable factors are scientifically important in what constitutes our object of study. We argue that this would put us in a position to better understand the phenomenon at hand, free to use what has been gained through the study of individual factors to deepen the comprehension of the complex structure that characterizes our inquiry, the reader. But such a shift does not come cheap. As hinted above, it forces us to admit that our models may at best predict how, in general, individual readers’ situations will likely evolve under specific conditions, conditions that we will never be able to fully determine and quantify. Such an outcome may fall short of the far-reaching expectations of policy makers and other stakeholders, which are less likely to be fully informed by consideration of such issues.

Yet we find the “true but imperfect knowledge” advocated by von Hayek theoretically preferable to and pragmatically more useful than the appearance of exact knowledge produced by abstracting the study of individual factors from their personal context. The former form of knowledge, though humbling, may at least indicate what conditions may, in general, foster growth and what conditions will likely stifle it, leaving the ultimate determination of the outcome to the still mostly unknown interplay of personal and social factors. The latter risks granting the scientific stamp of approval to specific interventions based on simplifications that are likely false (and thus not scientific), yet proposed (or imposed) as *the* way to growth.

We also propose two key instruction-related implications of this shift to a perspective on individual differences in reading that centers on the reader. The first is that it is critical that reading be approached in the classroom as communicative, as one person’s interaction with the ideas of another; the reader’s interaction with the text as the product of an author. Although it is encouraging to see this aspect of the reading–writing connection acknowledged in the Common Core State Standards in relation to writing, awareness of the author is only minimally

present in the language describing the standards for reading (Common Core State Standards Initiative, 2010), which is concerning. The other implication is that taking into account the reader as an individual leads to the conclusion that reading itself should not be split apart into in-school and out-of-school reading; the same reader is doing both. Presenting school reading as a tool providing access to instructional material and out-of-school reading as an immersive form of recreation can lead to the dichotomization of reading into pleasurable leisure reading for escape and entertainment on the one hand, and effortful, unpleasant, difficult reading to learn on the other. Such a divorce of enjoyment and learning from text has clear negative consequences in terms of development as a reader and learner.

In conclusion, we would like to point out that the set of questions about individual differences in readers that we introduced at the beginning of our chapter is itself premised on having already made the shift to centering on the reader. The very framing of our enterprise in investigating individual differences as one in which these are the key questions to answer means that we are already focusing on the reader. We hope that raising these questions has begun some of the work of opening up a space for further conversation about where we want to go in our research and theorizing about individual differences that are important for what readers do and who they can be. We have offered our own suggestion of a new orientation for our stories, investigations, and conclusions about individual differences, one that is centered on the reader. As a field, we do need to consider our aims and the directions we are taking to fulfill them. Ultimately, this means that we do need to think about why reading matters and about why differences between individual readers are something we need to understand.

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