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Why have L2 educators and researchers largely ignored the importance of L1 skills for L2 aptitude and L2 achievement?

Richard L. Sparks*
Mt. St. Joseph University, USA
Philip S. Dale
University of New Mexico, USA

Correspondence
Email: richard.sparks@msj.edu

Abstract

Despite the longstanding recognition of substantial individual differences (IDs) in L2 attainment, SLA/L2 researchers have a history of focusing primarily on universal characteristics and processes of language development. Theoretical work has failed to note and explore the nature and role of the strong evidence for large and stable IDs in early L1 attainment in all components of language development. Extensive research has also shown that there are strong relationships among IDs in L1 achievement, L2 aptitude, and L2 achievement outcomes. More recent investigations have found that prediction from the Modern Language Aptitude Test (MLAT), the strongest single predictor of L2 achievement, may be due largely to MLAT's assessment of L1 abilities, reinforcing the position that IDs in L2 achievement are strongly related to and constrained by L1 achievement. Despite the evidence that students' L2 achievement is closely related to their L1 achievement developed prior to L2 exposure, SLA/L2 researchers have largely failed to consider L1 skills as a factor that explains IDs in L2 achievement. Several hypotheses are proposed to explain why SLA/L2 researchers consider IDs in L1 attainment to be unimportant for L2 achievement.

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Introduction

In an exceptionally insightful paper, Dabrowska (2016) identified "seven deadly sins of cognitive linguistics." Although not written specifically for a L2 audience, several of the sins caught our attention. For example, Dabrowska cites *excessive reliance on introspection*, or using one's own intuitions as the primary source for theories about

language. She notes that many linguists do not have the technical knowledge to use other methods, but in other cases, their "sin" is an ideological choice. Another sin is *not enough serious hypothesis testing*, which she describes as the lack of deriving testable predictions from hypotheses, carrying out the tests, and modifying hypotheses when appropriate. A third sin is *not treating the cognitive commitment seriously*, or failing to support one's analyses by connecting what is known about human cognitive processing with a favored hypothesis and remaining uninterested in what other cognitive scientists have to say about human cognition. Dabrowska concedes that cognitive linguists have made great strides in studying language, but even so, she argues that these sins must be addressed if researchers are to produce fruitful results.

Given the first author's background in educational and clinical work on L1 variation and extensive research on L1-L2 relationships, the sin that caught his special attention was *ignoring individual differences*. Dabrowska claims that most cognitive linguists "do not look for individual differences and tend to sweep them under the carpet when they find them, with the result that they are usually ignored" (p. 485). While the study of IDs has been popular in L2 research, differences in learners' language skills, particularly in L1 achievement, have not been routinely considered by L2 researchers as important for explaining differences in L2 outcomes. As L1 educators for over 50 years, the lack of attention given to IDs in L1 skills and their impact on L2 achievement has always been puzzling, especially because inter- and intraindividual differences in L1 skills routinely have been found by researchers to be present *prior to* entry into school. In L1 research, IDs in oral and written language achievement are both normal and expected, and these IDs have been found to persist into adulthood (Kidd & Donnelly, 2020).

Sparks' research group has published a long chain of evidence over 30+ years supporting their long ago intuition that L1 skills serve as a foundation for L2 achievement (Sparks & Ganschow, 1991; Sparks et al., 1989). Those studies have shown that there are large differences in students' L1 attainment prior to L2 exposure and these differences are strongly related to their L2 aptitude and L2 achievement many years later in secondary and postsecondary education. Further, there is strong evidence showing that certain first language (L1) knowledge can be positively transferred during the process of L2 learning. The purpose of this essay is to review evidence on IDs in L1 attainment and their relationship to IDs in learners' L2 aptitude and L2 achievement. The extent and diversity of that evidence make the general tendency of L2 educators, and even many L2 researchers, to ignore IDs in L1 achievement all the more puzzling. Thus, the final section of this essay will propose several reasons why L2 educators and researchers may ignore IDs in L1 achievement.

IDs in L1 Development and Attainment: An Inconvenient Truth

Second language acquisition (SLA) and L2 researchers have assumed that "...everyone learns his first language with a fair degree of success" (Rubin, 1975, p. 41), and that "while children vary in their rate of [L1] acquisition...all, except in the case of severe

environmental deprivation, achieve full linguistic competence in their mother tongue" (Ellis, 2004, p. 525). Chomsky (1986) has claimed that variation, i.e., individual differences (IDs), in language acquisition is "marginal and can be safely ignored across a broad range of linguistic variation" (p. 18). However, these views of language acquisition in L1 are incorrect. L1 researchers have consistently found that language acquisition is characterized by "stable and meaningful IDs" and that "IDs within domains are typically related to differences in later developmental achievements" (Kidd & Donnelly, 2020, p. 332). More recently, the notion that IDs in L1 skills can be ignored when studying L2 acquisition is being questioned by L2 researchers. For example, Andringa and Dabrowska (2019) have asserted, "There are, in fact, considerable individual differences in adult L1 speakers' linguistic competence" (p. 73). But, IDs in L1 competence are also apparent as early as preschool age (Kidd & Donnelly, 2020).

Although most children do learn to communicate sufficiently well in their L1 that their everyday life is not substantially impaired nor do they require clinical intervention, there is normal variation in their rate of acquisition and in their communication skills across all components of the language system (Gilkerson et al., 2017; Hoff, 2013; Huttenlocher et al., 2010). IDs in L1 skills have been found to be large and stable (Bornstein & Putnick, 2012) and strongly related to students' later acquisition of L1 literacy skills (Kendeou et al., 2009). In fact, the "starting point for reading is speech" (Seidenberg, 2017. p. 15), and reading itself is "parasitic on speech" and language skills (Snowling & Hulme, 2007, p. 397).

Much of the early research in the first stages of language acquisition was conducted in the 1960s and 1970s under the influence of generative linguistics (Bellugi & Brown, 1964; Bloom, 1970) and was focused on commonalities across children. However, IDs in the development of oral language skills were evident and the focus of much research almost equally early (e.g., Nelson, 1973; Peters, 1983). Indeed, in Roger Brown's seminal study of Adam, Eve, and Sarah, substantial differences in their rate of development were noted but not much discussed, as the existence of such differences was taken for granted (Brown, 1973). The similarities in sequence were the new findings, and thus highlighted. Overall, these investigations showed there are striking regularities in childhood language development *and* important differences among children, i.e., inter-individual differences among children and intra-individual differences across linguistic dimensions in the development of a single child. One clear example is the size of children's expressive vocabularies at 24 months. Based on the norms for the MacArthur-Bates Communicative Development Inventories (Fenson et al., 2007), the median vocabulary size is 297 words; however, the range from 10th percentile to 90th percentile is 77 to 542 words.

In a seminal publication on the theoretical implications of IDs in language development, Bates, Dale, and Thal (1995) noted that in the process of focusing on new and indeed striking similarities, they had ignored the variation in the development of

child language as another source of theoretical insights. They described studies that documented variation in the language development of normal children that were substantial and stable in word comprehension, first stages of grammar, word production, and first word combinations. This variation included "enormous individual differences in onset time and rate of growth in each of these components" (p. 1). Notably, the variations found in normal children's language development were larger than variations in other developmental milestones, e.g., crawling, walking. Bates et al. summarized the evidence by showing: a) there is wide variability in the rate of language development from first words to grammar, b) the variations are stable and cannot be accounted for by a single causal factor, and c) language comprehension and language production may be dissociated in both normal and abnormal populations.

More recently, Kidd et al. (2018) reviewed a large body of evidence from psycholinguistics and made a similar argument for focusing on IDs in language development. They characterized IDs in language acquisition and processing as an "inconvenient truth: their presence is undeniable but our theories and experimental methods overwhelmingly downplay their importance" (p. 154). Like Bates et al., Kidd and Donnelly concluded that large and stable IDs across all domains of language are a pervasive feature of language development. Moreover, the "downstream effects" of IDs in early language development are apparent in children's vocabulary and grammar development, IDs do not disappear after childhood, and are observed among typically developing adults in their ultimate attainment. Two indications of the flourishing of interest in IDs in L1 at present are the development of the Wordbank database of cross-linguistic vocabulary development (Frank et al., 2017), which now includes data from more than 92,000 children learning 42 languages (retrieved September 11, 2024, from https://wordbank.stanford.edu) and the recent major international conference on "Many Paths to Language" held in October, 2023, at the Max Planck Institute in Nijmegen.

In sum, there is a long history of focus on universal characteristics and processes of language development in the SLA/L2 fields (Dabrowska, 2016). However, the importance of IDs for language theory has been devalued in the L2 literature and, at times in L1 theorizing as well, despite the evidence of considerable IDs in adult L2 attainment (Kerz & Wiechmann, 2022). Building on this evidence for large and stable IDs in early L1 attainment in all components of language development, there is also much evidence that these IDs in L1 are related to L2 aptitude and L2 achievement. Those relationships are explored in the next section of this essay.

Relationships among IDs in L1 Skills, L2 Aptitude, and L2 Achievement

In contrast to SLA theory, L1 educators, particularly those in educational psychology, speech and language, and special education, have long been aware that IDs in children's native language (L1) skills have important implications for their ultimate attainment in both L1 oral (e.g., vocabulary, grammar), and L1 written (reading, spelling, writing) language skills. Students with stronger L1 skills display more positive

educational outcomes--even outside the language domain, e.g., in math and science--than students with weaker L1 skills (e.g., see Dale et al., 2023; Hayiou-Thomas et al., 2010). Even so, prior to 1990 very little research had examined the relationship of IDs in L1 skills and subsequent L2 learning. In order to investigate L1-L2 relationships, Leonore Ganschow and Sparks authored the Linguistic Coding Differences Hypothesis (LCDH; Sparks & Ganschow, 1991, 1993), which posits that: a) native language (L1) skills form a foundation for L2 learning, b) the primary causal factors in more and less successful L2 learning are linguistic; c) high, average, and low-achieving L2 learners will display IDs in their L1 skills; and d) IDs in L1 predict ultimate attainment in the L2 (see also Sparks, 1995). The LCDH also proposes that IDs in students' L1 skills are related to and consistent with their aptitude for L2 learning. Like Cummins' (1979) research, these studies have found that L1 and L2 achievement have a common underlying foundation (see Sparks et al., 2011) and that students' L2 achievement is moderated by their L1 attainment (Sparks et al., 2019).

Starting in 1990, Sparks and colleagues conducted studies with secondary and postsecondary instructed L2 learners in the U.S. with its distinctive monolingual social context, little opportunity to use the language outside of school, and limited instructional hours. These studies with secondary and postsecondary U.S. L2 learners have generated impressive empirical support for the LCDH by showing that there are strong relationships between IDs in L1 and L2 achievement; high, average, and low achieving L2 learners exhibit significant differences in their L1 skills and L2 aptitude on the Modern Language Aptitude Test (MLAT; Carroll & Sapon, 1959, 2000); L1 skills are strong predictors of L2 aptitude and achievement; and IDs in learners' language aptitude are robust predictors of L2 achievement. [Comprehensive reviews of the studies reviewed here are provided in Sparks (2012, 2022a, b).] All *comparison* studies have found that high-achieving L2 learners display significantly stronger L1 oral and written language skills, particularly in L1 literacy and L2 aptitude (on the MLAT), than average and low-achieving L2 learners. *Prediction* studies have shown that early L1 skills, especially those related to L1 literacy, are strong predictors of L2 aptitude and L2 achievement. *Factor analysis* studies have revealed that L2 aptitude is componential, for example, the language skills measured by the MLAT load with similar L1 skills (e.g., phonetic coding on the MLAT and L1 phonetic word decoding), and L1 skills combined with the MLAT explain from 67-76% of the variance in overall L2 achievement. *Longitudinal* studies have shown that high, average, and low-achieving L2 learners exhibit significant IDs in L1 skills as early as 2nd grade, several years *prior to* L2 exposure in secondary school. *Cluster analysis* findings with students completing two years of L2 courses yielded three distinct cognitive and achievement profiles for L1 skills, L2 aptitude, and L2 achievement, i.e., those in the high-achieving (L2) cluster scoring generally in the above average range on all L1 measures and the MLAT, average-achieving in the average range, and low-achieving in the low average range. Also, IDs in L1 *print exposure* (reading volume) were found to contribute unique variance to L2 reading comprehension, word decoding, writing, oral comprehension, and overall L2 achievement in high school *after* adjusting for the

effects of L1 literacy, verbal skills, and cognitive ability measured in primary school, and L2 aptitude measured in 9th grade. Finally, investigations on the L2 anxiety hypothesis, including a longitudinal 10-year study, have shown that IDs in anxiety for L2 learning are strongly related to IDs in students' levels of L1 skills and L2 aptitude, i.e., students who display higher L2 anxiety have lower L1 skills and L2 aptitude and vice versa, and that *L2 anxiety* instruments are likely to be a proxy for IDs in students' language ability, their (accurate) self-perceptions of their language ability, or both. In the 10-year study, students who exhibited IDs in anxiety measured in 9th grade exhibited IDs in L1 oral and written language skills as early as 2nd grade.

Researchers in and outside the U.S. have also found strong relationships between IDs in L1 skills and L2 learning (e.g., see Comeau et al., 1999; Dufva & Voeten, 1999; Kahn-Horwitz et al., 2012; Lervåg & Aukrust, 2010; Melby-Lervåg, & Lervåg, 2011; Meschyan & Hernandez, 2002). Likewise, research with English language learners (ELLS) has supported the tenets of the LCDH (Borodkin & Faust, 2014; Helland & Kaasa, 2005; Kahn-Horwitz et al., 2006; Morfidi et al., 2007; van Gelderen et al., 2004). Sparks et al.'s conclusions were also supported in a recent study by van Koert et al. (2023), who found in a study with Dutch students learning English that L1 skills "lay the foundation" for L2 proficiency, both directly and indirectly.

In sum, studies with L2 learners have shown that: 1) there are IDs in L1 skills and L2 aptitude in normally achieving populations, 2) there are strong relationships among IDs in early L1 skills, L2 aptitude, and later L2 achievement, 3) L1 and L2 learning depend on similar language learning components in both languages, 4) L2 achievement is moderated by students' level of L1 skills, especially L1 literacy, 5) IDs in L1 skills, especially L1 literacy, and L2 aptitude explain significant variance in L2 achievement, and 6) IDs in language anxiety are linked to IDs in L1 skills and L2 aptitude. In the next section, we describe studies that have found evidence for strong relationships between L1 literacy specifically and L2 aptitude.

L2 Aptitude and its Relationship to L1 Literacy

For typically-developing children, there is a large body of evidence showing that IDs in L1 attainment *prior to* school entry and IDs in oral and written L1 achievement after several years of schooling are strongly related to IDs in L2 aptitude and L2 achievement, although L2 aptitude is the best single predictor of L2 achievement (Sparks et al., 2006; Sparks, et al., 2009). But until recently, L2 researchers had not yet investigated the relationship between L1-based prediction and L2 aptitude-based prediction of L2 achievement, specifically the extent to which they are the same or are cumulative. In a recent paper, Sparks (2022a) proposed that the development of L1 literacy skills leads to metalinguistic awareness, and that L1 literacy and metalinguistic awareness provide the foundation for L2 aptitude, or the ability to use and understand the types of "decontextualized" material found on L2 aptitude tests. This view leads to

the open question not heretofore investigated, namely, whether L2 aptitude itself may be, in part, dependent on L1 literacy skills.

To investigate this question, the authors of this essay embarked on a series of analyses using longitudinal datasets of U.S. secondary level students enrolled in L2 classes. In the first investigation over three years, students were administered measures of L1 oral and written achievement; working memory, L1 metalinguistic awareness, and L1 print exposure; L2 aptitude (MLAT); and L2 achievement (reading, writing, vocabulary) and oral proficiency (Sparks, Dale, & Patton, 2023). Hierarchical regressions and regression commonality analyses (RCA) showed that IDs in L1 achievement alone (reading, writing, vocabulary, print exposure) explained significant and substantial variance in all L2 skills, while L2 aptitude accounted for significant but modest additional unique variance each year. The aforementioned L1 skills explained from 42-50% of the variance for 3rd year L2 achievement and 20% of the variance in oral L2 proficiency. L1 literacy, especially L1 word decoding, was found to be not only the strongest predictor of L2 reading and writing but also for L2 oral proficiency. The MLAT accounted for from 2-14% of unique variance for all L2 skills after the effects of L1 skills had been partialed, suggesting that the MLAT may be measuring additional components of language ability, such as metalinguistic ability (decontextualized material) not tapped by the L1 measures (contextualized material).

In a second study with these participants, we (Sparks & Dale, 2023a) distinguished two aspects of the prediction from L2 aptitude to L2 achievement in the context of L1 measures. The study included six measures of L1 achievement, six measures of L2 achievement, and the MLAT. Regression analyses revealed that each L1 measure individually predicted all L2 achievement and MLAT scores. More strikingly, the unique contribution of MLAT to the prediction of L2 scores, that is, beyond the prediction from L1 measures collectively, was modest (12-40% depending on the L2 measure). At the same time, mediation analyses revealed that the MLAT was capturing only about half the variance in L1 that predicted L2 achievement, a measure which we termed 'efficiency' of MLAT prediction. We concluded that the prediction from MLAT to L2 achievement is due primarily to its functioning as a measure of L1 abilities, although substantial L1 variance which predicts L2 scores is not captured by MLAT. Other aspects of the results pointed to a much more important role for L1 literacy in explaining L2 aptitude and L2 achievement than has been previously acknowledged. We cited other research evidence that L1 literacy and metalinguistic skills may be overlapping constructs that provide the foundation for L2 aptitude. These findings were replicated in a study that followed students from 1st-10th grade at which time they had completed two years of high school L2 instruction (Sparks & Dale, 2023b). The results of this replication study showed that the L1 measures administered in elementary school predicted MLAT scores several years later, and the MLAT predicted L2 achievement, including L2 literacy scores. L1 word decoding literacy from 1st-5th grades was the strongest overall L1 predictor of L2 achievement in high school. The unique contribution of the MLAT was modest for predicting L2 achievement. Overall,

the results again supported the conclusion that prediction from MLAT to L2 achievement is largely due to MLAT's assessment of L1 abilities.

Like most studies, the aforementioned three investigations each used the MLAT composite (total) score in the analyses. This practice reflects the view that the five MLAT subtests do not correspond in a 1-1 fashion to Carroll's four components of language aptitude (Stansfield & Reed, 2019) and the finding that overall aptitude has greater predictive value than the individual subtests (Li, 2015, 2016). As a result, little or no research has been conducted using the MLAT subtests as predictors of L2 achievement (but, see Li, 2019, p. 87). In a newly completed investigation, we (Dale & Sparks, 2023) used regression commonality analyses (RCA) to decompose the predictive variance from the MLAT into unique components for each subtest alone, and for each possible combination of subtests that may have shared variance. The results from this study with the aforementioned longitudinal database of U.S. secondary L2 learners provided strong evidence for the role of literacy-related skills in all MLAT subtests, and for the prediction of all L2 achievement outcomes. In particular, the findings demonstrated the central importance of the Phonetic Script subtest, which measures learning of a new sound-symbol system, alone or in combination with other subtests (shared variance between them) for prediction of L2 outcomes, which led us to the observation that all five MLAT subtests are more or less dependent on, or related to, literacy skills. We proposed that the important link between students' L1 oral language and L1 literacy skills for contextualized material and their ability to understand the decontextualized material on an L2 aptitude test like the MLAT may be the *metalinguistic* skills that have been found to be developed by L1 literacy, i.e., learning to read and write their L1, and subsequent practice with reading (and writing) the L1 via print exposure (see Sparks, 2012a, b).

In sum, we propose that stronger L1 language and literacy skills lead to stronger development of metalinguistic awareness (language analytic ability), which in turn, leads to stronger L2 aptitude and L2 achievement. We maintain that literacy has often been taken for granted by L2 educators and researchers because of the focus on listening and speaking, and also that literacy has not always been viewed as different from oral skills. The evidence suggests that instructed language learners with stronger literacy skills may be those learners whose language skills are so robust and so automatized that they have the freedom to think "metalinguistically" when engaged in L2 learning.

Why Do L2 Researchers Consider IDs in L1 Achievement to be Unimportant for L2 Achievement?

When Sparks and Ganschow began their research and introduced the LCDH in 1989, they explained that their early view of L2 achievement rested on a foundation of L1 achievement skills. Although robust research evidence since that time has revealed a richer complexity of L1-L2 relationships, the empirical evidence has supported the basic premises of the LCDH, specifically: a) L2 learning is the learning of language; b)

L1 skills serve as a foundation for L2 achievement and development; c) L1 and L2 learning draw on the same pool of cognitive abilities; d) language aptitude is componential; and e) there are large and stable IDs in L1 achievement developed *prior to* L2 exposure and these differences are reflected in IDs in L2 aptitude and L2 achievement. It has always seemed odd to us that the extensive body of cumulative evidence supporting L1-L2 relationships with respect to IDs has been largely overlooked by the SLA/L2 field despite the centrality to the field of IDs in L2 learning, e.g., vocabulary, grammar, listening, speaking, reading, writing. For example, IDs in L1 attainment was not included as an ID factor for L2 learning in the recently published *Routledge Handbook for Second Language Acquisition and Individual Differences* (Li, Hiver, & Papi, 2022). Similarly, the long line of research revealing the strong relationships between IDs in L2 anxiety and IDs in L1 skills and L2 aptitude and showing that language skills are confounding variables in the L2 anxiety-L2 achievement relationship (e.g., see Sparks, 2023; Sparks & Ganschow, 2007; Sparks & Patton, 2013), is not included as a topic in the recent special issue of the *Annual Review of Applied Linguistics* devoted to L2 anxiety and L2 learning. Why would the evidence showing that IDs in L1 attainment are strongly related to IDs in L2 aptitude and L2 achievement be ignored by L2 researchers? We will propose several hypotheses. Each of these hypotheses is, in principle, testable. We acknowledge that like children learning their first language, and adolescents and adults learning a second language, SLA/L2 professionals - researchers and teachers - constitute a highly diverse group, with important IDs of their own concerning theory, empirical methods, and personal interests. None of these hypotheses will apply to everyone, and no one person is influenced by all of them.

First, SLA/L2 researchers have rejected the idea that L2 aptitude and L2 achievement are related to, and may be constrained by, L1 abilities because this proposition implies deterministic limitations, i.e., L2 achievement is bounded by L1 attainment. Recognition that IDs in L1 achievement are related to/predictive of L2 aptitude and L2 achievement would undermine the idea of "unlimited potential" for all students to achieve a specific level of L2 proficiency. Of course, the notion of limitations on L2 achievement does not mean a fixed "all-or-nothing" criterion for L2 development, but that learners' L2 achievement will not be far from their L1 achievement.

Second, SLA/L2 researchers became focused on the genuinely striking similarities in language development uncovered by work on early language development that was done by L1 researchers, who as noted earlier, were focused on the relative similarities in sequence *within* quantitative variation, e.g., research on the grammatical morphemes of English. SLA/L2 researchers simply ignored the variation aspect of development. The dominant position of generative linguistics, with its strongly universalist view, no doubt contributed to this position. As cited earlier, Chomsky (1986) claimed that variation, i.e., individual differences (IDs), in language acquisition are "marginal and can be safely ignored across a broad range of linguistic variation." Gass and Selinker (1994) also downplayed the role of language differences and

reported that "... linguists are uncomfortable with any claim of significant differences in native language ability" (p. 233). A related point is the widespread impression among L2 educators, which may prove to be accurate, that variation in L2 learning is greater than that in L1 learning. However, it is not possible to formally quantify this impression, as it would require use of common scales for both domains. But even if true, the fact that the reduced variation in L1 learning makes such strong predictions to L2 is evidence for its developmental significance and the adverse effects of ignoring it for theory and practice.

Third, a closely related point to focusing on similarities and ignoring differences in language development is that SLA/L2 researchers have assumed most individuals achieve "full linguistic competence in their mother tongue" (see Ellis, 2004) and that differences are minor and of little or no theoretical relevance. Hence, they can be disregarded. Gass and Selinker wrote, "all normal children learn language in roughly the same way and within the same time frame and because there is equipotentiality in language" (p. 234), and even though empirical evidence has shown otherwise (e.g., see Sparks, 2022b), suggested that IDs in language aptitude may be the result of "social and societal backgrounds." As noted earlier, these views may be changing, especially with regard to IDs in adults' language skills (Andringa & Dabrowska, 2019).

Fourth, SLA/L2 researchers have often subscribed to an alternative category of explanations for IDs in L2 achievement, especially motivation and affective factors. This shifts the question to a new formulation: why do SLA/L2 researchers want to believe these nonlinguistic factors to be more important than language factors for more and less successful L2 learning? As a close colleague once remarked to one of us, "it is curious that researchers with such an interest in language would propose explanations unrelated to language for L2 achievement." It is likely, though as yet untested, that this is due to the belief that motivation and affective factors are more malleable. If the evidence showing that L1 achievement, L2 aptitude, and L2 achievement are strongly related and that L1 achievement places constraints on L2 aptitude and L2 achievement is disregarded, then SLA/L2 researchers can feel free to propose explanations and educational practices for IDs in L2 achievement that range farther afield, despite a lack of persuasive evidence for the underlying hypotheses. The mistaken interpretation of correlations with respect to causal direction, such as that between anxiety and L2 achievement, has likely been a consequence of this attitude (see Sparks, 2023).

Fifth, a closely related point to the claim that most children reach full linguistic competence in their native language, is the availability of tests to measure language skills. Unlike the U.S. where standardized testing measures are available to measure all L1 skills and compare students to their same age (grade) peers, many countries have not developed individually-administered, well-normed standardized tests designed to measure students' L1 oral and written skills. Thus, IDs in students' native language skills cannot be identified and quantified. In his private practice, the first author can

use standardized tests to measure a 6 year old child's expressive and receptive language skills (grammar, semantics, oral expression, etc.), expressive and receptive vocabularies, phonemic awareness, word decoding, reading comprehension, spelling, and writing skills and compare the student using the test norms to, e.g., other 6 year olds, and even to the student's specific age in years and months, e.g., 6 years, 11 months. In the U.S., there are well-normed, standardized tests available to measure children's skills prior to school entry through elementary, secondary, and postsecondary education and also for older adults. In recent conversations with colleagues in Europe, Asian, Middle Eastern countries, most indicated to us that individually-administered, standardized tests were generally unavailable, although some group tests of reading and writing were available at the elementary and secondary levels of education.

Sixth, most SLA/L2 researchers are likely to have above average to excellent L1 skills, strong language aptitude, and high motivation; consequently, it is hardly surprising that they propose theories about learning a L2 that conform to their own perceived behaviors about how and why they learned a L2 (L3, L4...). Like Calculus and Physics teachers who have high levels of math and science skills and aptitude, and who believe students could excel if they would just "study more" and "try harder" to improve their performance, L2 educators may also believe, "because I did it, they (students) can do it, too." In the same way, educators in L2 courses may fail to attribute their success in mastery of L2s to their own strong L1 skills and language aptitude, and instead posit that strong motivation, low anxiety, strong metalinguistic ability, etc., were the key factors in learning another language. To be more explicit, while motivation and other positive affective qualities are important for achievement at high levels of L2 competence, they are clearly not sufficient for it. Whether these beliefs in motivational and affective factors represent an excessive reliance on introspection, e.g., a lack of technical knowledge for use with other methods, or are ideological in nature, e.g., objective methods are incompatible with the "spirit of cognitive linguistics" (see Dabrowska, 2016), or reflect a lack of awareness of their own strengths and weaknesses, the beliefs ignore the necessity of strong language abilities for L2 development.

Conclusion

We began this essay by citing Dabrowska, who described several "sins" of cognitive linguistics. We have focused primarily on the sin of ignoring IDs, one of which is disregarding the evidence for the role of IDs in L1 achievement for explaining IDs in L2 aptitude and L2 achievement. Enterprising researchers should search for explanations for IDs in L2 achievement and they should consider both cognitive and noncognitive variables as predictors of L2 aptitude and L2 achievement. However, explanations for more and less successful L2 achievement have been limited by failure to acknowledge IDs in early L1 attainment that are both large and stable, persist into adulthood, and predict later language outcomes, including L2 achievement.

One of the most substantial negative consequences of disregarding the influence of IDs in L1 for L2 achievement is the lack of research exploring boundary effects and moderator effects on these influences. The majority of research on L1 influences has been conducted on the learning of a few European languages by native speakers of English in adolescence in the U.S. Each of these features may have distinct impact on the relation of L1 to L2, and merits contrast with other features in future research. Consider, for example, the major result of this work, which is the demonstration that L1 literacy is uniquely important as a predictor for L2 aptitude and L2 achievement (see Dale & Sparks, 2023; Sparks & Dale, 2023a,b; Sparks, Dale, & Patton, 2023). If L1 literacy is easy to learn due to a transparent orthography (e.g., Italian, Finnish), it may not be as strong a predictor of L2s with opaque orthographies. Likewise, if L1 literacy isn't phonologically based (e.g., Chinese), it might be a less robust predictor, although evidence of phonological processing in reading Chinese suggests that this analysis may be simplistic (e.g., see Yang & McBride, 2020). Danish, with its uniquely opaque orthography reflecting very different properties from English, is another L1 of special interest, though we hazard no prediction here.

When considering the conundrum of why IDs in L1 skills and their relationship to L2 aptitude and L2 achievement have been ignored, and sometimes denied, one of us recalled a phrase often used by his Latin teacher when he failed to provide the answer that was "under your nose": *in sterquiliniis invenitur*, which she loosely translated as "that which you need most is found where you are least likely to look."

ORCID

 https://orcid.org/0000-0001-8856-9880

 https://orcid.org/0000-0002-7697-8510

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