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Exceptional Outcomes in L2 Phonology: The Critical Factors of Learner Engagement and Self-Regulation

[1]ALENE MOYER

[1]School of Languages, Literatures and Cultures, College of Arts and Humanities, University of Maryland
E-mail: moyera@umd.edu

A number of studies attest to the late language learner's ability to attain native-like outcomes in morphology and syntax, with accent often the only linguistic hint of their non-native status. Nevertheless, some do end up sounding native-like despite a late start. This article explores possible explanations for 'exceptional' outcomes in L2 phonology, specifically, whether such learners' abilities are due to innate talent, a metacognitive learning approach, a certain social-psychological orientation, or specific kinds of experience. Various learners profiles are compared, an argument is made for learner engagement and self-regulation, and areas for future research are outlined.

INTRODUCTION

It is no exaggeration to say that those beyond early childhood who aim to master a new language begin at a vastly different starting point than those who begin at birth. The second language acquisition (SLA) literature is replete with theories and hypotheses about why this is so, ranging from neuro-cognitive to social to psychological explanations including first language (L1) interference, affective 'filters' of one sort or another, the decreasing accessibility of an innate language acquisition device, social and cultural barriers to assimilation, etc. (see Bley-Vroman 1989). What is certain is that at least one language is already in place as a knowledge base, which can imply greater metalinguistic awareness, yet may also be detrimental insofar as L1 cues and patterns are already salient (see Hansen 2004 for second language, or L2; Kuhl *et al.* 2008 and Strange and Shafer 2008 for L1). The first language(s) may limit what the learner notices in L2, and what she or he is therefore able to emulate at the level of performance.

According to Selinker (1972), just 5–10 percent of adult language learners can expect to reach a native-like level, but even this low threshold may be somewhat ambitious for phonological fluency. Nevertheless, some late learners do attain a level that can be described as native, or native-like, for some series of perception-based and/or production-based tasks (e.g. Ioup *et al.* 1994; Bongaerts *et al.* 1995; Moyer 1999). This fact begs two questions that have long fascinated SLA scholars: (i) *What makes a successful language learner?*[1] (ii) *Why*

does phonology uniquely challenge so-called 'late' language learners in comparison with other aspects of language? This article merges both questions by examining several reasons why some late learners are particularly successful in the realm of accent.

Scovel (1988) famously asserted that age effects in L2 phonological acquisition are directly related to neuro-muscular or perceptual skill development, rather than affective factors. His argument was based on two important premises: (i) phonology uniquely relies on neuro-muscular faculties for both perception and production; (ii) affective factors could not reasonably restrict phonology, yet have no effect on other aspects of language ability. Indeed, shifts in neuro-muscular flexibility and or cognitive mechanisms have long been assumed responsible for the relative difficulty of learning a new sound system given that phonology relies on both speech-motor control and auditory-perceptual neural networks. On the other hand, phonology also holds a unique connection to one's sense of self, or identity, and therefore speaks to more than just neuro-cognitive and neuro-muscular constraints. Moreover, it is undeniable that target language experience shapes one's approach to acquisition over the long term, and thus the likelihood of native-like attainment. Evidence confirms correlations between accent ratings and a host of individual factors, among them: length of residence (LOR) in the target language country, age of onset/first exposure, and both quantity and quality of experience in the target language, not to mention motivation and attitudes (e.g. Purcell and Suter 1980; Thompson 1991; Bongaerts *et al*. 1995; Elliott 1995; Flege and Liu 2001; Diaz-Campos 2004; see also Moyer 2013).

In sum, numerous cognitive, social, and psychological factors, both intrinsic and extrinsic in nature, point towards a possible understanding of exceptional outcomes. In a sense then, the phenomenon of exceptionality signifies a nexus for the two dominant paradigms of SLA: a decidedly cognitive or psycholinguistic approach on the one hand, and on the other hand, a largely sociolinguistic perspective focused on the 'whole person'. This article argues that the mysteries of exceptional learning, so rare in L2 phonology, cannot be explained by either one or the other, but resides at the intersection of both realms. What can explain the fact that some L2 learners, despite a late start, end up sounding native-like? Are we to understand them as 'phonological geniuses' with extraordinary, innate talents? Alternatively, do they have special ways of utilizing input, or can they somehow access linguistic resources in unusual ways? What accounts for their extraordinary success?

With these questions in mind, I first describe what is generally implied by 'exceptionality' in L2 phonology, then present case studies which suggest a number of common characteristics of their approach to language learning. In so doing, the relevance of both self-regulation and engagement with the target language become clear. I conclude by suggesting that the fascination with some as-yet-determined special talent obscures the need for an integrated examination of the cognitive, social, and experiential factors that co-vary

with age. The research on exceptionality calls for a dynamic view of learner engagement with the target language over time in order to understand the ways that exceptional learners make the most of the available input, and take a flexible approach, responding to the circumstances at hand.

EXCEPTIONALITY IN L2 PHONOLOGY

To clarify, 'exceptional' refers to those who defy the Critical Period Hypothesis (Lenneberg 1967); they sound native-like even though their exposure to the target language comes after age 9–10 years (the critical period for phonology is arguably even earlier, but 9–10 years is a relatively common yardstick in the research, in keeping with Lenneberg's original hypothesis). So, which specific skills or skill sets are implied when we talk about exceptionality, or native-likeness, in phonology? By and large, we mean the ability to perceive and/or produce new sounds like a native speaker would, verified through relevant tasks which are often isolated or decontextualized (see Levis and Moyer 2014). Kuhl's 2007 study on American and Japanese adults confirmed that this is challenging owing to L1 category salience. Her American listeners could accurately pinpoint the acoustic differences between /r/ and /l/ while her Japanese listeners could not owing to this contrast's absence in Japanese. Further distinctions based on subtle features like vowel quality, aspiration, and voice onset time (e.g. the difference between /ɪ/ and /ɛ/ or /d/ and /t/) can also be difficult to detect if they are irrelevant in L1. This is likely more difficult when L1 and L2 features overlap, but are not quite the same, as Flege and Hillenbrand (1987) have shown for the English vs. French versions of the phoneme /u/. Instruction and experience can bridge this gap for both production and perception (e.g. Flege and Hillenbrand 1987; Rojczyk 2011), even long-term (e.g. Sereno and Wang 2007), but mastery eludes most L2 learners, it seems, and even the untrained ear can detect the difference between native and non-native speech. As shown in Major (2007), listeners completely unfamiliar with the language in question can accurately separate native controls from non-native speakers, which suggests that there is something unique, and highly salient, about a non-native accent.

Accent is not just a matter of phonetic or segmental precision. To sound 'native-like' the learner must control a number of different features that operate in conjunction with one another, including tempo, rhythm, pause, juncture, pitch patterns, and intonation. Pickering and Baker (2014) confirm that judgments of accentedness rely on sentence stress (prominence), pause placement patterns, speech rate, and tone choice. (They also point out, however, that such judgments are prone to listener background variables such as native/non-native status and attitudes towards the speakers' presumed backgrounds.) While tests of such ability are limited to isolated words or phrases, as noted, some do include a complex range of tasks including spontaneous speech, which allows for greater confidence in deeming a given learner as 'exceptional' (see Moyer 2013). Few such cases have been examined in depth, however.

In my own research I have come across enough such learners to draw a few parallels between them. Interview data from Moyer 2004 study of immigrants to Berlin shed light on the unique profiles of two Turkish men whose families had immigrated to Germany by the time both were 4 years old. Both should have ended up sounding native according to the Critical Period Hypothesis, but only one consistently did across all tasks. Their stories revealed very different attitudes towards the language and culture—one very positive and the other quite conflicted. The first one, *Ahmet*, says he learned German 'on the street' as a young child and 'absolutely' wanted to sound German. He has 'countless' German friends and acquaintances. The other, *Korech*, describes his accent as 'noticeable' and his contact with Germans as minimal. He reports a completely different orientation: he consciously aligned his social activities with his core Turkish self-concept throughout his life, choosing to avoid using German at home, and failing to make permanent friends with any German schoolmates. His discomfort with German culture was a strong motif throughout his interview.

In a 2007 study on attitudes and accent, I similarly describe the backgrounds of two English as a Second Language (ESL) learners of differing L1 backgrounds who were judged to sound native for the majority of pronunciation-centered tasks, including extemporaneous speaking. They had a number of things in common which reflect not just attitudes, but experience, and future intentions vis-à-vis the target language and culture: both had immigrated to the USA by age 5 years and had at least 13 years residence; both intended to stay at least five more years, had a strong and consistent desire to sound native, a strong level of comfort with American culture, and used English consistently among native speaker friends in multiple, socially oriented contexts. There were others who also enjoyed an early start with English (by age 5 years), but without all of these experiential and psychological benefits, and their accent ratings were not on par with these two.

These data, coupled with evidence from other studies, suggest that age of onset (AO) by itself is not a sufficient explanation for attainment. The question is whether truly exceptional attainment is a function of multiple factors, and whether these factors derive from a unitary source, such as the neuro-cognitive realm. The discussion above suggests otherwise, namely, that *experience* and *orientation* are central to this outcome. In order to better understand this phenomenon, we now look more closely at several case studies.

EXCEPTIONAL LEARNER PROFILES

Looking at the L2 phonology literature, several learners have been deemed exceptional for their production in pronunciation tasks, so let us consider the factors associated with their success, namely, self-professed neuro-cognitive 'talents' or aptitudes, social and psychological orientation, and L2 experience.

Ioup *et al.* (1994) describe two American speakers of L2 Arabic who completed a series of tasks, including free speaking. The one they single out as exceptional is *Julie*, who had lived in Egypt for 26 years at the time of data collection. Julie could not speak Arabic when she moved to Cairo after marrying an Egyptian. She acquired Arabic completely without instruction, and it had long since become her primary language at home. From the beginning of her immersion, Julie wrote down observations about the language, and appreciated explicit feedback on her errors (p. 77). Julie reported that she set out to mimic, rather than analyze, the accent of native speakers (with a self-described talent for mimicry, she reported 'no problems', even with Arabic pharyngeals and uvulars). By Ioup *et al.*'s account Julie had no noticeable foreign accent, which they attribute to her cognitive/metacognitive approach. Another learner profiled (to a lesser extent) in this study is *Laura*, also an American living in Cairo and married to an Egyptian. Laura had studied standard Arabic for years and had taught it to other learners in the USA. She moved to Cairo to make greater strides in her oral fluency as she pursued doctoral work in Arabic. At the time of data collection, Laura had lived in Cairo for 10 years. Eight out of 13 Egyptian listeners rated both Julie and Laura as native speakers, despite their different paths to advanced attainment (Julie's ratings were higher on average). Only a few points of vowel quality and intonation were noticeable to several judges, but otherwise, both passed as native speakers 'more often than not' according to the authors (p. 80). Julie and Laura were also able to discriminate regional accents in Arabic with 100 percent accuracy, outperforming the native speaker judges at 85 percent accuracy. This suggests that both Laura and Julie had 'a good ear', and possibly some innate talent indicative of unusual cognitive flexibility (p. 91). In the case of Julie specifically, they also note that she was outgoing, and thus had access to 'abundant comprehensible input and error feedback' (ibid.).

A number of Nikolov's (2000) learners of English ($N = 13$), and learners of Hungarian ($N = 13$) in Hungary were rated as native-sounding on both read-aloud tasks and extemporaneous speech. All started learning the language in question at the age of 15 years or later. Some were married to native speakers, and most were professionals working in Hungary (including as teachers), thus the author assumed a high level of motivation. Nikolov also ascribes to them a genuine pride in their achievement, noting:

> Language is either a part of their profession or they have very strong integrative motivation to become bone fide residents of the target language country. . . . All of the successful participants try to find chances for improving their second language proficiency, they are outgoing characters and like to socialize. All are avid readers in the target language, listen to the media and try to feel at home in the culture as well as in the language. (p. 116)

One of the most successful learners acquired Hungarian without any instruction, and another who sounded native in English had spent only one semester

abroad in an English-speaking country, but spent time mimicking radio announcers. (Judges, who ranged widely in age, confirmed that their ratings were based on pronunciation, intonation, and overall fluency, that is, lack of hesitation and false starts, for their ratings.) The common thread among these learners is a proactive approach: all said they wanted to sound native, and all sought ways to improve their fluency through communicating with native speakers, as well as engaging in more receptive activities such as watching TV, viewing films, and reading in the target language.

From among their NNS participants living in Ireland (mean age of onset of 22.5 years) who completed a film-retelling task in English, Muñoz and Singleton (2007) pay special attention to two learners, the first named *Elena*. Originally from Spain, she is married to an Irishman, and claims many (in fact, only) English-speaking Irish friends. Elena had consciously avoided Spanish speakers since her arrival, and only speaks her native tongue when visiting with family members. She discusses her conscious efforts to improve her English, but also believes she has inherited a special aptitude for languages. *Marga*, another participant, similarly cites a persistent desire to master all linguistic aspects of English, but describes her drive as predicated on a love of the language as opposed to an overt desire for cultural affiliation. Both Marga and Elena continuously monitor their own progress and fluency, even after having reached a high level of fluency, and they still endeavor to improve their English, in particular through social interaction. The authors describe both learners as having a 'thirst' for becoming native-like.

Another case of an exceptional learner who was consistently rated as native for all production tasks is singled out in Moyer 1999. This late learner's scores were actually better on average (across all tasks combined) than any of the actual NS controls. He had studied German just five years (beginning at age 17 years)—far less than most of his peers in the study—and describes himself as 'self-taught' for the most part. Before embarking on a 2-year study abroad experience, he spent hours listening to exchange student friends from Germany in an effort to 'absorb the sounds' of the language. He had no problems assimilating linguistically and culturally while living in Germany those 2 years. His narrative echoes a common theme among exceptional learners in that he cites a 'fascination' with the target language and its culture.

Molnár (2010) also discovered several Polish learners of German who arrived in Germany after age 11 years, and had received no special training, yet rated on par with native speaker controls on read-aloud and free speaking tasks. Through a (very limited) background survey, Molnár ascertained that these learners primarily used German in their daily lives, had no anxiety vis-à-vis foreign language learning, described themselves as 'extroverts', and placed the highest possible importance on sounding native. The learner with the best ratings had studied linguistics, English, and German language pedagogy, had resided in-country for 18 years, and had also learned several other languages while in German high school. In contrast to the others, she seldom used her native language.

In a 1993 study, Major focuses on a group of American women living in Brazil. All had immigrated between the ages of 22 and 35 years, were married to Brazilians, raised their children speaking Portuguese, and were employed as ESL teachers. All completed read-aloud and extemporaneous speaking tasks. While most were forthcoming about their failure to acquire fluent Portuguese despite a very long residence (20–35 years), one woman had resided in-country 12 years and was convinced that she could pass for native. Major's analysis of her Voice Onset Time (VOT) values confirmed this. She was untutored, but made a point of mentioning that she 'carefully paid attention to linguistic forms and pronunciation and took mental notes of things, which later became part of her competence' (p. 472). She also reported 'feeling Brazilian', unlike her counterparts. The others had obvious American accents, and reported feeling 'strongly' American. In fact, she had absorbed Portuguese so fully that her English had traces of Portuguese VOT patterns, and when visiting the USA, she was continually asked whether she was American (p. 472). Importantly, Major's study leads him to conclude that both L1 and L2 are 'dynamic, fluid entities and can vary over time' (p. 475); this woman's English pronunciation later reverted to a decidedly American version after she moved back to the USA and disavowed her Brazilian identity.

Finally, I mention *Dora*, a learner of German profiled in Moyer 2004. Dora was a Polish-born immigrant living in Berlin with a self-described intense motivation to sound like a native speaker. She fell within the native range for several pronunciation tasks, including extemporaneous speaking. In her 6 years in residence, Dora's approach to accent was to mimic others and to focus on the phonetic features that are still problematic for her, indicating a meta-linguistic awareness. She described her social network in Berlin as limited, but made an effort to positively reconstruct her negative encounters as a foreigner in Germany to maintain her deep personal attachment to the language. Despite limited opportunities to interact in German, Dora kept an upbeat attitude and a firm commitment to the language. (Another late learner with near-native ratings overall similarly expressed ease with new experiences in general and cultural adjustments in Germany, and both she and Dora said they avoided personal contacts with other speakers of their native language.) Dora felt herself fully 'at home' in Germany, even if she did not see herself as German.

Considering all of these learners' profiles, a constellation of factors emerges; some cognitive, some affective or psychological in nature, and some experiential. For example, nearly all expressed a deep sense of personal connection to the language and a metacognitive approach, regardless of the amount of interpersonal contact and/or formal instruction available to them. They make the most of the resources at hand, with some going so far as to distance themselves from those who share their native language in an effort to reach their goal of becoming native-like. Table 1 summarizes the factors explicitly mentioned by the learners and/or researchers.

Table 1: Comparing exceptional learner profiles

	Ioup *et al.* 1994	Nikolov 2000	Muñoz and Singleton 2007	Moyer 1999	Molnár 2010[a]	Major 1993	Moyer 2004
Self-described 'talent' or aptitude	√		*				
Metacognitive approach	√	√	√	√		√	√
Pride in L2 attainment (intrinsic motivation)		√	√			√	√
Strongly identifies with L2 (integrative)	√	√	√	√		√	√
Desire to sound native		√	√	√	√	√	√
Socially outgoing	√	√	√	√	√	√	
L2 use across multiple domains	√	√	√	√	√	√	√
LOR 8+ years	√	*	√	X	√	√	X
Significant formal study (5+ years)	*	X	*	X	√	X	√
Early age of onset	X	X	X	X	X	X	X

√ = confirmed by researcher and/or mentioned by participant.
X = does not apply to exceptional learner(s) in this study.
* = inconsistent (e.g. if more than 1 exceptional learner cited, some did mention while others did not, or disagreed).
[a] The blanks for Molnár's column and elsewhere in the table do not equal a negative response, rather they indicate that the data were not provided.

Cognitive factors

- *Self-described talent/aptitude*: Several participants said it was not hard for them to learn languages (or the language in question, even if other ones had been difficult). For the most part, however, this was not explicitly asked by the researchers, thus there is little to conclude about the relevance of this factor.
- *(Meta)cognitive approach*: Nearly every exceptional learner mentioned self-monitoring, imitation of native speakers, attention to difficult phonological features, and explicit concern for pronunciation accuracy. In general terms, a cognitive approach is indicative of practice, reasoning, note-taking, analyzing, etc., and the metacognitive level involves planning, goal-setting, reflection, and evaluation (Oxford 1990).

Psychological factors

- *Pride in L2 attainment*: Several expressed enjoyment of, and appreciation for, their own progress in the target language although in some cases (e.g. Muñoz and Singleton 2007) these very advanced learners continued to view their attainment critically, which likely reflects their drive to improve.
- *Strong identification with L2*: This construct represents an integrative orientation towards the language and/or culture, with these learners typically immersed in social activities via close social networks. Many also cited an intention to stay in-country for the foreseeable future, or permanently.
- *Desire to sound native*: Most expressed this overtly and described their efforts to achieve this goal, even having already reached an unusual level of attainment.
- *Socially outgoing*: These exceptional learners had a proactive approach to language acquisition, endeavoring to make contacts, and describing themselves as uninhibited, outgoing, extraverted, and willing to take risks.

Experiential factors

- *L2 use across multiple domains*: All of the learners mentioned L2 use in the home environment with family and friends. They also enjoy reading, listening to the radio, and watching TV and films, in addition to socializing. In other words, the target language has permeated all levels of their lives; it does not just serve perfunctory or limited purposes.
- *Length of residence of 8+ years*: Of those who had long-term residence, most had resided 8 years or more, but Length of residence (LOR) was inconsistent across learners, with the lowest cited at 2 years (LOR figures were not provided in all of the studies cited).
- *Significant formal study of the language*: Some had many years (i.e. 5+ years) formal instruction in the language but others had none at all.
- *Early age of onset*: This factor does not apply to any since they are considered 'exceptional'—all were exposed to the language after the age of 10–11 years.

Several patterns are noteworthy here. First, every 'exceptional learner' attests to at least one item in each of the three categories: *cognitive*, *psychological*, *experiential*, but the psychological realm stands out with greater description (possibly because it was easier to ascertain by self-report). Secondly, long-term residence and/or instruction are both inconsistent factors. At least in the case of length of residence, this seems to contradict a good deal of evidence found in ultimate attainment studies. It is possible that neither is essential for exceptional outcomes. Thirdly, these learners have much in common in terms of their approach to language learning and their use of the target language. The strongest commonalities based on the data provided were as follows:

- *Metacognitive approach*
- *Strong identification with the language*
- *Strong desire to sound native*
- *Socially outgoing orientation*
- *The use of L2 across multiple domains*

It should also be noted that in several cases minimal L1 use was mentioned, which is another factor that deserves far more investigation in the research, as does the possibility that experience with multiple languages holds some advantage for pronunciation abilities. We now consider these factors in somewhat broader terms commonly referenced in the L2 phonology research, and in SLA more generally.

EXPLANATIONS FOR EXCEPTIONALITY

There are several possible explanations for these learners' extraordinary success, represented in Figure 1.

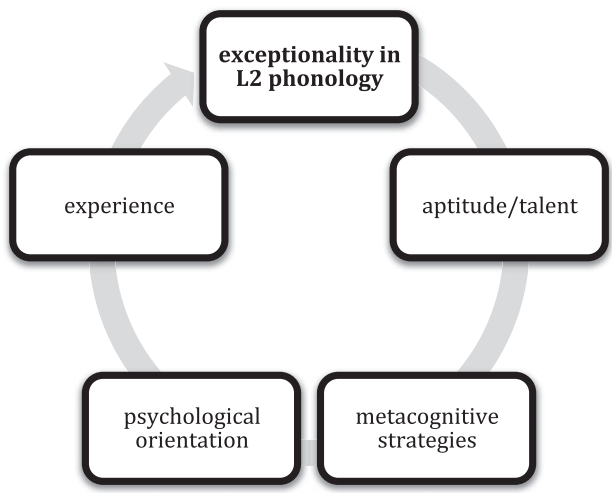

Figure 1: Explanations for exceptionality

Aptitude and talent

Although talent and/or aptitude was only explicitly mentioned in two cases (Ioup *et al*. 1994 and Muñoz and Singleton 2007), and no researcher assessed this through anything other than self-report or impressionistic data, we consider it nonetheless because it generates such interest in the literature. *Aptitude* is understood to refer to individual differences which, by all accounts, lie within the cognitive realm, such as the ability to remember acoustic information and phonological patterns. The focus of aptitude research, however, pertains overwhelmingly to lexical and morphosyntactic retrieval and learning, with little discussion of phonological learning per se.

The Modern Language Aptitude Test (Carroll and Sapon 1959) established several key components said to predict language learning success with reasonable accuracy, including the capacity to code and retain unfamiliar sounds (phonemic coding), and the ability to form links in memory (discussed in Skehan 2002; Dörnyei 2010). Robinson (2002) proposes a broader 'aptitude complex', consisting of phonological working memory (WM); processing speed; the ability to encode, infer, apply, and store specific patterns; and the ability to 'notice the gap' between one's own production and a given (i.e. native speaker) model. Discussions of aptitude relative *to phonological skills* prioritize *working memory*, defined as the 'ability to keep important information in mind while comprehending, thinking, and doing' (Conway *et al*. 2007). WM is supported by the phonological loop function which allows the listener to hold and rehearse sound sequences in short-term memory during speech processing, and to direct attention and promote subvocal articulation that feeds into long-term memory. Individuals may vary as to how much they rehearse and/or visualize certain verbal patterns, the speed with which they can process information, and the degree to which their memory and processing effectively interact during a specific task (Towse and Hitch 2007).

Other ideas relevant to phonological talent include the possibility that: (i) those with musical inclinations have a special ability to mimic accent; and (ii) those who process language bilaterally have an advantage when it comes to perception—and by extension, production—of tone, rhythm, pitch, etc., since these are processed primarily in the right hemisphere. Studies of musical talent have produced mixed results (Tokuhama-Espinosa 2003; Gottfried 2008; Baran-Łucarz 2012), and hemispheric processing studies have shown primarily that novices of new (e.g. tonal) languages tend to be bilateral processors, whereas those with greater experience processing tones are left-hemisphere (LH) dominant (as are musicians familiar with the tones in question) (Sereno and Wang 2007). This would seem to indicate that once a level of experience is gained, processing shifts to LH dominance. Neither hypothesis is yet supported by conclusive evidence. At the same time, a study of 66 learners of English did find that rhythm and pitch *perception* significantly correlated to *production* abilities in accent (Nardo and Reiterer 2009). Sereno and Wang (2007) similarly found evidence for the transference of

perceptual abilities to production, based on overt training. More evidence of this type is needed.

Very few researchers have studied WM as it relates to L1 phonological *acquisition*, even fewer have done so for L2, and studies that do exist tend to produce mixed results. For example, Hu *et al.* (2012) investigated a number of neurocognitive factors—phonological WM, phonetic coding ability, music aptitude, verbal Intelligence Quotient—and a range of behavioral factors such as empathy, extraversion, openness to new experiences, and conscientiousness. They found that phonological WM did not predict pronunciation aptitude (assessed by a reading task) in 109 advanced learners with an average age of onset of 10 years, but coding ability, music aptitude, empathy, and openness to experience did. Their regression analysis further identified coding ability and empathy as the most significant predictors of pronunciation aptitude, explaining 34 percent of the variance. Rota and Reiterer's (2009) results for WM are similar. They examined 20 'highly talented' individuals out of 60 overall language learners using a digit span task and an intelligence test based on Raven's Progressive matrices for reasoning and abstract thinking, but found no significance for either. Nor did their analysis yield significance for 'mental flexibility', defined as selective attention and reaction time during task-switching. Interestingly, they also found significance for empathy, defined as both social and emotional intelligence according to a questionnaire developed by Leibetseder *et al*. (cited in Rota and Reiterer 2009) to measure 'sensitivity' and 'concern' in fictitious vs. real-life situations. In fact, empathy correlated to phonemic coding ability, suprasegmental perception, imitation ability for an unknown language (Hindi words), and self-proclaimed enjoyment of imitating accents. Both studies underscore the connections between the cognitive and affective realms.

Learner style and strategies[2]

Some have suggested that aptitude is more generally related to overall cognitive abilities and style (Skehan 1998), and that having a predominantly auditory style correlates to pronunciation accuracy (Baran-Łucarz 2012).[3] These exceptional learner profiles all speak to the importance of ongoing self-monitoring of progress, regardless of instruction. By this I mean explicit attention to difficult (phonological) features, frequent imitation of native speakers, and conscious concern for pronunciation accuracy. Is this metalinguistic orientation the key to their success? Others have confirmed that field independence—representing an analytical style that is detail-oriented—plays a significant role in pronunciation success (Elliott 1995; Baran- Łucarz 2012).

Although my 2004 analysis (Moyer 2004) did not find significance for any specific strategy, the more strategies undertaken the better for phonological fluency, particularly when the imitation of native speakers was one of those strategies. This suggests an effect for rehearsal and reflection, that is, a possible connection between the phonological loop function and actual phonological

learning. Furthermore, those who focused on their pronunciation shortfalls were more likely to seek out informal practice and feedback with NS, indicating a link between cognitive and social strategies. The list of common learning strategies among these learners includes the following:

- Self-monitoring
- Explicit attention to accent
- Frequent imitation of native speakers
- Conscious concern for accent and/or desire to sound native
- Authentic practice and input in informal domains

The array of these factors recalls Sasaki's (1996) assertion that 'expert' language learners exhibit more flexibility in the range of strategies they apply to language leaning, whereas monolingual ('novice') learners apply undirected, general strategies (based on a study by Nayah *et al.* 1990, cited in Sasaki 1996). Sasaki's own analysis of many cognitive factors among Japanese learners of English confirmed this pattern; the lower proficiency learners tended to use just one or two strategies per task, whereas those at a higher level of proficiency demonstrated multiple strategies per task. (Far more evidence is needed on language learning strategies directed at phonology specifically, since it is unclear whether learners make accurate links between their own pronunciation shortfalls and either specific learning strategies or interactional, 'real-time' repairs. This aligns well with Dörnyei's (2010) idea that ''L2 learners are engaged in an ongoing appraisal and response process, involving their continuous monitoring and evaluating . . . and then making possible amendments if something seems to be going amiss'' (p. 255). This is the essence of *self-regulation*. Self-regulating learners know ''what they believe . . . have a grasp of their motivation, are aware of their affect, and plan how to manage the interplay between these as they engage with a task'' (Winne 1995, cited in Dörnyei 2005: 162). Simply put, self-regulating learners control their own actions in order to enhance learning (Dörnyei 2010: 256).

One important question is whether late learners are less inclined to undertake such social risks as younger ones. According to Victori and Tragant (2003), older learners are less likely to engage in the same kinds of active social strategies as their younger counterparts. In their assessment of 766 ESL classroom learners in Spain, the younger learners made the effort to study and socialize with their native speaking classmates, and also enjoyed practicing sounds out loud in their presence. Older learners tended towards passive activities like watching TV and listening to the radio. Of course one's overall self-concept and approach to new endeavors is relevant as well, and these are highly individual constructs.

Psychological orientation

All indications are that exceptional learners take charge of their learning and create opportunities for practice outside the classroom. This points to an ongoing drive, or motivation, which has been verified as significant for a

closer-to-native accent. In the Bongaerts *et al*. study, and in Moyer's 1999 piece, nearly all of the L2 learners cited a keen interest in sounding native-like, and all reported a 'professional orientation'; they wanted to teach the target language, or otherwise use it as an integral part of their career—a seemingly instrumental orientation that is focused on achieving a specific, externally directed goal.

Related to the motivation construct is the question of how learners perceive themselves and their abilities, as well as their belief that they have the power to make desired improvements through sustained effort (also known as self-efficacy). The exceptional learners profiled here had a tendency to underestimate their skill level, as mentioned above. Of interest is the study by Baran-Łucarz (2012) in which L2 learners of English whose pronunciation was 'excellent' tended to downgrade their attainment while a majority of those considered 'poor' overestimated their abilities, yet said they could realistically assess their skills, and that L2 pronunciation was 'easy to learn' although not in their control—a notable indication of false self-concept and low self-efficacy (p. 298). Excellent learners, in other words, believe that they can control their progress, even if they are not yet satisfied with it.

The issue of motivation type has a long history in the SLA research and has led to an emphasis on 'integrativeness', or the desire to affiliate closely with a given language community and culture (see Clément and Kruidenier 1983; Masgoret and Gardner 2003; Dörnyei 2005). Clement and Kruidenier suggest that assessing motivation type must be done on an individual basis because we cannot presume to know whether a learner's desire to affiliate with the target culture is more intrinsic or extrinsic in nature, and whether one or the other has a greater effect on ultimate attainment (see also Purcell and Suter 1980; Bongaerts *et al*. 1995; Moyer 1999, 2004). Munoz and Singleton's 2007 study suggests that motivation type does not make the difference after all, and my 2004 and 2007 statistical comparisons (Moyer 2004, 2007) verify that the *intensity* of one's drive to acquire the L2—and even more, the *consistency* of that drive over time—is what matters for ultimate attainment in accent.

Understanding stability and consistency in psychological orientation requires more differentiated instrument designs. Longitudinal data are essential to understand whether motivation and attitudes relevant to language learning constitute traits, or core, aspects of the learner's self-concept as opposed to situational or domain-specific 'states' which constitute its more dynamic and responsive aspects. One relevant study is Mercer's (2012) longitudinal analysis of an advanced learner of English living in Germany, conducted over 22 months. Mercer's objective was to examine the flexibility vs. stability of self-concept—the cognitive and affective beliefs a learner has about herself relevant to a specific area, for example, learning English (p. 202). Her interview data reveal a stable, core self-concept vis-à-vis English predicated on a strongly positive orientation towards the language. As with many of the learners described above, 'Joana' expresses a love of English, and says ''that will never change'' (p. 204). Indeed, over the course of the study, it remained

so, even when certain aspects of her ability were critiqued (here: writing). Mercer concludes that Joana's self-concept is inherently connected to her overall approach to language learning. In her case, this meant directing her energies in active and social ways, focusing on interaction rather than more receptive modes of L2 experience such as studying and reading.

It is reasonable to assume that factors like risk-tolerance, extraversion, and empathy have some role to play in exceptional L2 outcomes, and several learners profiled here were described as 'outgoing' and very social. Indeed, Obler (1989) long ago speculated that exceptional learning comes down to a combination of neurological talent and tolerance for risk-taking.

In a 1999 review of the literature, Dewaele and Furnham speculate on the connections between extraversion and neuro-cognitive approach, with implications for learning strategies and outwardly directed behaviors. The original hypothesis of Eysenck, who first described the construct in 1947, was that extraverts were 'underaroused' in the autonomous nervous system and in the cortex, leading to a search for greater external stimulation (ibid.). The authors' review of the research confirms associations between extraversion and a 'positive affect'; relatively low levels of anxiety; greater willingness to communicate (WTC); self-reported frequency of communication in L2; and superior short-term memory—all of which surely affect how extraverts seek and utilize input (and output), especially beyond the classroom, for the benefit of oral fluency. They further speculate that extraverts' lower anxiety corresponds to greater capacity in WM, and that WTC effectively increases output, which speeds up the ''proceduralization of different kinds of knowledge'' (p. 536). [The longitudinal data from Van Daele *et al.*'s (2006) study of 25 Dutch students learning English and French yielded intriguing, though mixed results; however, extraversion seemed to present a 'trade-off' between accuracy and fluency on a narrative retelling task.]

Very few studies speak to the relevance of personality type for accent specifically (but see Hu and Reiterer 2009), although few would dispute the notion that native-like abilities in L2 phonology hinge upon an openness to developing new experiences, and ultimately a new sense of self, in the target language. Relevant here is Lybeck's (2002) study of nine American women living in Norway and Hansen's (1995) examination of 20 German-born adult immigrants in the USA, both of which emphasize the learner's willingness to develop a new L2 identity as significant for pronunciation. I have also shown significant correlations between accent and one's perceived ease of establishing contact with native speakers; comfort assimilating culturally; and intention to reside long-term (5+ years) in the target language country (Moyer 1999, 2004, 2007). Dewaele (2005) has called for a deeper exploration of *how* learners learn on a social and emotional level, and this seems especially relevant for L2 phonology.

Specific attitudes and motivational type are arguably less important than the underlying *investment* in the language that they represent (Moyer 2004, 2013). These exceptional learners have all developed a strong sense of self in the L2,

surely contingent on an ''openness to identify with another language community'' (as Masgoret and Gardner put it—2003: 6), and the motivation to maintain an 'ideal' self-concept, in Dörnyei's terms (2005), which is an orientation towards achievement and success more generally. According to Dörnyei's (2010) schema, the 'ideal L2 self' can only be an effective motivator if the learner actually has a 'desired future self-image' which is both 'elaborate and vivid', and if that ideal self is ''accompanied by relevant and effective procedural strategies that act as a roadmap towards the goal'' (p. 257). Another way to think of this is that exceptional learners have an unusual connection to their 'possible selves', which act as forward-pointing 'self-guides' (Dörnyei 2010: 265). Some of the learners profiled here referred explicitly to such a conceptualized self as a guide for their efforts.

The critical emphasis in Dörnyei's self-concept schema is the dynamic overlap between cognitive and social strategies, and psychological orientation. With a new emphasis on 'dynamic systems', SLA researchers should now develop thoughtful ways to investigate how successful learners use motivation, develop emotional connections, maintain positive attitudes, develop goal-setting, undertake socially directed behaviors, and engage in reflection and self-evaluation.

Experience

Length of residence, as one of the most basic measures of L2 experience, has produced mixed results across studies (Piske *et al*. 2001). Recently, Saito and Brajot (2013) have found statistical significance for LOR at the early stages (within approximately 1 year) for certain formant frequencies (F1 and F2) and formant transition duration, and significance for longer LOR for another formant (F3) among 65 adult Japanese learners of English. While they only tested production of /r/, it is possible that residence on either end of the scale, for example, within 1–3 years or after 10 years, correlates more significantly to accent ratings (Moyer 2011). This merits more investigation, as does the possibility that LOR is particularly relevant for the development of suprasegmentals like pitch melody, as shown by Baker and Trofimovich (2005).

Traditional measures like length of residence and time on task (e.g. hours of use per week) provide too little detail on how the learner uses L2, with whom, and under what circumstances. Where LOR findings are robust, they likely represent a significant shift in L2 use (Moyer 2009) given that those who cite plenty of interactive L2 use, across different contexts, are judged to have more authentic accents (Thompson 1991; Flege and Liu 2001; Diaz-Campos 2004; Jia *et al*. 2006; MacKay *et al*. 2006; Derwing *et al*. 2007; Moyer 2011). A longer LOR has been shown to correlate to greater interaction among NS friends, greater use of L2 overall, and less use of L1 (Moyer 2011).

Indeed, these learners all cite primary use of L2 in the home domain. It seems that, collectively, they have undergone an important shift in language dominance, giving credence to Thompson's (1991) claim that those who lose

their mother tongue stand a significantly higher chance of sounding native in L2 than those who maintain it. This idea is supported by Flege *et al.*'s 1999 study of 240 Korean immigrants in the USA whose L2 dominance correlated positively with accent, even after controlling for AO. Their early arrivers received significantly more education in the USA, used more English in daily life, and reported less use of Korean overall, while those arriving at age 12 years or older maintained a more balanced use of English and Korean.

Ultimately, we are interested in the learner's orientation because this is what determines what they do with the input: how they structure it and how they utilize it, in other words, how they *engage* with the language. This can give us a better indication of the quality of L2 experience over the long-term (Jia and Aaronson 2003; Moyer 2004, 2009; Flege *et al.* 2006). We know that exposure alone is never enough to reach a native-like or near-native level. Just think of those who live for years in a host country without progressing beyond rudimentary linguistic skills, or those who overhear another language as children without developing any real competence in it. For this reason, measures of L2 *experience* must signify active, meaningful, and consistent language use, and it must be appreciated for what it says about the role of that language in the learner's life. Where L2 becomes dominant, or effectively replaces L1, it clearly takes on not just instrumental, but emotional and social significance. Using L2 in the home within their own families and/or among their roommates has likely intensified these exceptional learners' desire and efforts to sound native.

The discussion above shows that these learners are highly engaged; they have 'conscious and unconscious structuring of opportunities, as well as attitudes and perceptions, towards a set of goals—the underlying mechanisms for engagement being cognitive, social and psychological in nature' (2004: 145). While the *engagement* construct is complex and somewhat idiosyncratic, it is still, I would argue, critical to L2 phonology outcomes.

CONCLUSION

Baran-Łucarz concludes that exceptionally good pronunciation learners ''owe success to an ideal combination of cognitive traits . . . strong intrinsic motivation, extensive exposure to authentic spoken language, good phonetic knowledge, and a strong belief that one is in control of progress in learning'' (2012: 299). So while 'having a good ear' or some particular cognitive ability to notice phonetic detail may be essential for accurate pronunciation, this cannot suffice to get to an exceptional level in real speech. The evidence reviewed here, while based on only a handful of studies with varying methodologies, suggests that those who do have greater cognitive flexibility and a more conscious, selective approach to specific strategies tend towards more native-like abilities in L2 phonology. Their conscious approach is, above all, flexible; it evolves in a dynamic way throughout the acquisition process. These learners also have a meta-analytic orientation, as they all reflect on the efficacy of specific strategies (Schneiderman and Desmarais 1988; McLaughlin 1990). They also enjoy a

consistently high level of motivation, access to authentic input and interaction, and a propensity towards learning strategies that are both socially oriented and metacognitive in nature. For future work, more data are needed for differing L1–L2 pairs, with instruments taking deliberate account of various social, cognitive, and psychological data in order to solidify a predictive model for learner engagement in L2 phonological attainment.

Exceptional learning is by no means a one-dimensional phenomenon, nor I would argue, is it based solely on an as-yet-to-be-determined talent or some single resource. Rather, it is the manifestation of a constellation of factors—cognitive, psychological, social, and experiential. We must therefore follow learner engagement over time, tracking the ways that exceptional learners make the most of the available input. The learners presented here do not even claim those aspects of experience traditionally identified as necessary—a considerable length of residence, formal instruction, or even early onset. Yet they consistently use the target language in ways that have great personal significance.

I have argued here for a *constellation* of influences on accent, attested by these exceptional learners, to underscore several important principles: (i) these influences do not operate in isolation from one another—the affective and the cognitive go hand-in-hand as one seeks, and consciously utilizes, the input available; (ii) an exceptional learner's drive to sound native is neither static nor *a priori*—it is ongoing, conscious, and flexible, yet may be predicated on a stable core self-concept relevant to language learning; and (iii) no single factor guarantees a native-like accent—nor does one single factor, like age, preclude it.

Many questions for future work remain, pertaining to the following areas:

(a) Processing and memory: It remains to be seen whether certain types of processing and/or memory are particularly relevant for the ability to perceive, as opposed to produce, new sounds, or vice versa. More evidence is needed to substantiate the relative interdependence of these two processing levels, and whether and how gains in one area affect the other. In addition, because pronunciation relies on a variety of neural resources, it is likely that the balance of these resources is reconstituted at various stages of the learning process (see Hu *et al.* 2012). Longitudinal analyses are essential for understanding this inherently dynamic system.

(b) Learning strategies and learning context: Specific learning styles and strategies surely have varying degrees of effectiveness as a function of the learning environment. For example, instructed environments[4] may favor left-hemisphere processors, whereas immersion favors bilateral or right-hemisphere processors. Explicit study of exceptional learners' processing patterns would be invaluable, especially of a longitudinal nature. It would be important to understand which aspects of language are processed bilaterally, for example, and how this may shift with experience.

(c) Adaptability of processing and adaptability of aptitude: There is a need to understand the extent to which hemispheric processing shifts with experience, and similarly, whether aptitude is responsive and adaptable, as opposed to innate and/or static. In general, aptitude has been thought of as less relevant for communicative, interactive learning than for instructional, focus-on-form situations (Skehan 2002), but it is still unclear how specific abilities interact with specific learning conditions. Perhaps most intriguing is the question of whether aptitude shifts with experience, that is, whether it is somehow learnable.

The focus on individual differences in SLA runs the gamut from affective to cognitive, to social and experiential factors, and for no skill is this focus more relevant than for phonology. Pronunciation skill development is perhaps the greatest test of one's desire to successfully acquire a new language given the complexity of the task and its inherent relevance for self-concept. As I have argued elsewhere, this struggle is negotiated in proportion to the target language's value and significance in the learner's life, the attitudes held about its speakers, and the value of language learning in general (Moyer 2013). It is therefore worth emphasizing these exceptional learners' deep investment in the target language is predicated on a drive to continually refine and improve fluency, and a constant reflection on how well they are accomplishing their goals. The specific means by which they do this includes attention to fine detail, consistent rehearsal, self-reflection, and self-critique—none quite thinks he has 'arrived' yet, which gives the impetus to further refine his abilities.

Exceptional learning in SLA is legend—a story told with fascination, but too-often dismissed as a false challenge to the Critical Period Hypothesis. As Scovel has said, applied linguists are ''fascinated with dichotomies'', such as those who acquire a language before age X will succeed, those who do not simply cannot succeed (1988). But such dichotomies are increasingly shown to be mythical—widely held but often erroneous ideas. For Scovel, the age question is ultimately compelling because it asks us to examine how nature and nurture work together ''through time'' (1988: 5). As seen in this analysis, some learners can indeed attain to a native level, but this is a process, and the factors that predict their success converge at the unique interaction between learner and context.

NOTES

1 This question has a long history of its own which is beyond the scope of this article, and here I do not wish to imply that success is an absolute, but rather that it is 'relative to the goal', as Cook puts it (2010: 154). We consider here learners whose goal it is to sound like native speakers.

2 Style generally refers to learning preferences without regard for the specific task, whereas strategy refers to a goal-directed technique aimed to optimize learning (Oxford 1990).

3 Baran-Łucarz measured this via the *Barsch Learning-Style Inventory* for 50 Polish high school students learning

English who completed free speech, dialogue reading, minimal pair reading, and perception tasks.

4 Some of the learners here had little or no instruction, so they may have brought to bear so-called implicit learning mechanisms (whether these are accessible after a certain age is another debate), or simply used explicit strategies very effectively.

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NOTES ON CONTRIBUTOR

Alene Moyer received her PhD from the University of Texas at Austin in Germanic Languages and Applied Linguistics. She taught at Georgetown University, and has been at the University of Maryland since 1999. Her research focuses on long-term learning outcomes in both classroom-focused and naturalistic language acquisition, with a special emphasis on L2 phonology. She is author of *Foreign Accent: The Phenomenon of Non-native Speech* (Cambridge University Press, 2013); *Age, Accent and Experience in Second Language* (Multilingual Matters, 2004); and is co-editor of *Social Dynamics in Second Language Accent* with John Levis of Iowa State University (DeGruyter Mouton, 2014). Prof. Moyer's work is published in several books, edited volumes and in journals such as *Studies in Second Language Acquisition*, *Canadian Modern Language Review*, *Journal of Multicultural and Multilingual Development*, *Issues in Applied Linguistics*, and *Foreign Language Annals*. *Address for correspondence:* 1102 Francis Scott Key, College of Arts and Humanities, University of Maryland, 20742. <*moyera@umd.edu*>