Synergetic themes in cognitive and sociocultural bilingualism research: Moving towards a transdisciplinary approach

The picture that emerges of the French-English bilingual in Montreal is that of a youngster whose wider experiences in two cultures have given him advantages which a monolingual does not enjoy. Intellectually his experience with two language systems seems to have left him with a mental flexibility, a superiority in concept formation, and a more diversified set of mental abilities, in the sense that the patterns of abilities developed by bilinguals were more heterogeneous.

(Peal & Lambert, 1962, p. 20)

Larry is a gifted speaker of the Black English vernacular (BEV) as opposed to standard English (SE)… Larry also provides a paradigmatic example of the rhetorical style of BEV: he can sum up a complex argument in a few words, and the full force of his opinions comes through without qualification or reservation.… The reader will note the speed and precision of Larry's mental operations. He does not wander, or insert meaningless verbiage.

(Labov, 1972, par. 21-24)

This is an Accepted Manuscript of a book chapter published by Routledge/CRC Press in *A Transdisciplinary Lens for Bilingual Education: Bridging Cognitive, Sociocultural, and Sociolinguistic Approaches to Enhance Student Learning* on November 2021. Available online: https://www.routledge.com/A-Transdisciplinary-Lens-for-Bilingual-Education-Bridging-Cognitive-Sociocultural/Bauer-Sanchez-Wang-Vaughn/p/book/9780367690281

Introduction

Over the past few decades, psychological research has brought to public attention the many merits of being bilingual, i.e., speaking or using more than one language, or in the case of bidialectals, more than one language variety. Although speaking two languages was once considered a detriment to cognitive and language achievement (Saer, 1923), contemporary psychology and sociolinguistics now provide both complimentary as well as seemingly complementary views of bilingualism. On the one hand, sociolinguistic understandings of language diversity are rooted in linguistics, sociology and anthropology. The asset-focused perspective exemplified by Larry's gifts, described above in Labov's (1972) early studies of multidialectal African American English speakers, has given rise to the study of variationist sociolinguistics, such as super-diversity (Vertovec, 2007) and translanguaging (García, 2009), that similarly valorize linguistic variation. Similarly, in the cognitive domain, an equally asset-focused perspective is rooted in the field of psychology and its focus on the individual mind and brain. The cognitive bilingual is embodied in Peal & Lambert's (1962) study of French-English bilinguals with superior mental capacities bestowed by multilingual experience.

Superficially, these two favorable depictions appear to be two sides of the same coin: affirmations of the linguistic resources uniquely possessed by diverse individuals and groups. Positive views of bilingual and to a lesser degree of bidialectal speakers in the modern era appear to have supplanted earlier unfavorable representations of the unimportance or disadvantage of speaking two languages (Saer, 1923). The legacy of bilingual cognitive inferiority is still found in educational and linguistic concepts articulating deficiencies associated with racialized and

politicized understandings of multilingual speakers: the vocabulary gap (Carlo et al., 2004), incomplete acquisition (Montrul, 2006), semilingualism (Escamilla, 2006), and long-term English learners (Freeman & Freeman, 2002). This apparent dichotomy between historical devaluation and current appreciation of multilingualism, however, obscures deeper connections to social and historical forces that have driven common paradigmatic change in both the cognitive and the sociolinguistic study of bilingualism. In this chapter, we seek to describe deep-seated links between cognitive psychology and sociolinguistics as common responses from two fields grappling with changing views of what it means when individuals and societies use two, three, or more languages. The chapter spotlights three parallel changes that unite the fields in a shifting understanding of linguistic identity: 1) from singular and unitary to multiple and intersectional; 2) from homogeneous to heterogeneous; 3) from the normative to socially and historically conditioned, addressing the origins of our modern study of language in racialized settler colonialism.

Throughout the chapter, we use the terms ‘bilingual’ and ‘multilingual’ interchangeably to refer to persons and groups who use, i.e., speak or sign, more than one language or language variety (including varieties of dialects and signs). Most cognitive research uses the term *bilingual* to generally denote more than one language, but we also include *multilingual* here to periodically remind the reader of the inclusivity and applicability to individuals using multiple language systems, whether named as languages, dialects, or something in between (e.g., creoles and pidgins). Most of our examples come from work on bilingualism, simply because this is where most cognitive research has been conducted, whereas psycholinguistic work with dialects is extremely sparse and with creoles virtually nonexistent. However, the parallels the chapter describes apply to human linguistic variation in all its forms.

Peal and Lambert's 1962 conclusions regarding the superiority of the bilingual mind were but one turn in a longstanding conversation about intelligence and mental superiority. Decades earlier, D.J. Saer, a British headmaster living in Wales, had reported an apparently opposite finding: (English) monolinguals were more intelligent than (Welsh-English) bilinguals. Saer (1923) explicitly connected British colonial rule with the teleological future of English dominance, not only in the far-flung Empire, but also in the home countries including Wales, where a push for national and language determination saw events such as the founding of Plaid Cymru, the Party of Wales three years after this finding appeared. Forty years later, Peal and Lambert's research was conditioned by a tense social and political dialogue in Montréal of the 1950's and 60's where a similar movement for Québécois regional and language determination was occurring. The participants in Peal and Lambert's study were French-English bilinguals studied in a place and at a time when Anglophones held historical positions of economic power in newly industrialized Québec but were faced with rising Francophone nationalism (Barreto, 1998). Peal and Lambert thus found, just as Saer had, a dominant group, in this case French-English bilinguals in the city of Montréal, to be mentally superior, and a less powerful, minoritized group, French monolinguals, to be inferior.

The question of mental superiority in bilingualism continues to be hotly debated through present times in the form of a controversy over superiority in executive functions (Antoniou, 2019). Without the benefit of historical perspective, however, the colonial project of dominance and control embedding this debate is easily forgotten in a search for observable and measurable behavior. Thus, it is important to look beyond simple affirmations and condemnations when connecting psychological and sociolinguistic understandings of bilingualism. In the case of Peal and Lambert's (1962) work, the educational consequence of highlighting the cognitive

superiority of French-English bilinguals would be support for a French immersion bilingual education system that allowed a privileged Anglophone minority to use additive French bilingualism to shore up eroding economic control (Fraser, 2011). A quite different consequence for bilingual education would arise from Labov's (1972) work, with an, albeit unsuccessful, push for Ebonics instruction recognizing the legitimacy of African American English and seeking to empower the language of an underrepresented and disadvantaged racialized minority (Labov, 1982).

As these examples suggest, the cognitive and sociolinguistic research fields do not exist in isolation; rather, they work with two distinct units of linguistic analysis: the individual mind and social groups. How do we bridge these two lines of work? In this chapter, building on the links between these dichotomies in psycholinguistics and sociolinguistics, we offer parallel ways of understanding the shared enterprise of cognitive and sociolinguistic research on bilingualism. Broadly conceived, this enterprise grapples with the consequences of increasing diversity and shrinking colonial empires of the 20th and 21st centuries, seeking to understand how language diversity operates both within and across individuals and how linguistic power is to be distributed in a presumably post-colonial academy. The modern empirical finding that bilinguals are not mentally inferior is neither random, nor a result of scientific progress, the advancement of knowledge, or a teleological progression of enlightened social attitudes. Rather, just as with Saer and Peal & Lambert, this finding is brought about by a changing focus in language research from defining universality and homogeneity to explaining variation and heterogeneity. It is conditioned by local and global contexts and by changes in geopolitical power, migration, population diversity, economic resources, and the social conditions that accompany them. While cognitive research may not explicitly reference the 'social turn' (Block, 2003), super-diversity

theory (Vertovec, 2007) or the ‘multilingual turn’ (May, 2014), migration trends, and increasing linguistic and cultural diversity penetrate social discourse and research samples (Henrich et al., 2010), driving changes in psycholinguistic findings and conclusions. Just as sociolinguistic work has done, cognitive research is thus shifting its focus from the universal monolingual to the heterogeneity of bilingualism as a life experience. And from an experiential, interactional perspective, individual differences observed in the mind and brain can only be accounted for as consequences of bilingualism when sociolinguistic aspects of language contact, usage, and exposure are characterized.

We write this piece from the perspective of North American cognitive scientists of bilingualism with linguistic and ethnic roots outside the White and Anglophone North, a positionality informing the optimism we have for cognitive research and the value we place on its linkages to sociolinguistic work. At a time of the quantitative-qualitative divide in education research, our work examines psychological and biological manifestations of bilingualism largely using empirical and quantitative methods. In spite of cognitive science’s firm footing within a positivist epistemology, we believe it is possible for us and others who take this perspective to critique the particular psychological and biological findings we study as existing in a Foucauldian system of power and knowledge (Foucault, 1980), recognizing the possibility of alternate epistemologies in decolonizing language in education (Pennycook & Makoni, 2020). This hybrid positionality leads us to focus upon research findings that are simultaneously emerging disciplinary truths and epiphenomena, conditioned by particular social, economic, and geopolitical conditions that influence disciplinary choices around the methods, models, and paradigms used in the cognitive science of bilingualism.

In this chapter, we reflect on three emerging disciplinary trends, examples of key and interrelated findings in the cognitive science of bilingualism that have analogous trends in sociolinguistics. First, we discuss the principle of language co-activation, the idea that a bilingual's two languages are always active, and its surprising symmetry with the sociolinguistic concept of intersectionality as strategies for describing the *multiplicity* of linguistic identities within an individual. Next, we discuss the cognitive principle of bilingualism as a multidimensional gradient rather than a category. We connect this understanding of graded bilingualism as a dynamic life experience with the sociolinguistic emphasis on diversity and hybridity as strategies for describing and giving structure to the *heterogeneity* of linguistic identity. Third, we describe the psycholinguistic adaptation of the principle that "bilinguals are not two monolinguals in one person" (Grosjean, 1989, p.3), disrupting the *normativity* of linguistic identity and its consequences for interrogating the monolingual and monodialectal standards of comparison that sociolinguistics has called out as racialized and politicized legacies of a colonial era. Finally, we conclude with some reflections on the ways these connections between cognitive and sociocultural understandings of bilingualism can disrupt traditional dichotomies of bilingualism as good or bad and help educators better understand and support bilingual learners.

A Bilingual's Two (or More) Languages are Always Active: Language Co-activation and Intersectionality

What does it mean for a person to speak two or more languages? The study of multilingualism by its very nature questions the homogeneity and universality of the linguistic subject. One key line of research investigating within-subject multiplicities in the

psycholinguistics of bilingualism has examined whether and how two languages co-exist in an individual's mind and brain. In studies of monolingual English language comprehension and production, language functions have long been known to be predominantly associated with functional activity in the left hemisphere of the brain in both children (Dehaene-Lambertz et al., 2006) and adults (Hagoort, 2017). One early question addressed in cognitive studies of bilingualism was whether this association still held true for bilinguals' first (L1) and second language (L2), or whether an L2 was processed in different brain structures other than those processing the L1. Functional magnetic resonance imaging (fMRI) studies show that language representation in the brain varies widely depending heavily upon the age at which an L2 was acquired, but also upon acquisition context, language proficiency, and manner and degree to which the L2 is used. Nevertheless, overall L1 and L2 brain representations are more similar than different, forming an integrated language system (Cargnelutti et al., 2019). Further, there is reciprocal influence between L1 and L2 such that acquiring a L2 also changes features and usage of L1.

In addition to neural representation, automatic linguistic processing can be captured more directly by tracking eye movements while listening to languages. By measuring pre-conscious eye movements, Marian and colleagues (2003) found that Russian-English bilinguals drew subconsciously upon both of their languages even when listening to only one, the 'target' language. Subconscious phonological representations of words in both Russian and English were active during the earliest stages of processing a spoken English word. However, bilinguals were able to suppress the non-target language when consciously deciding on the word's meaning.

Since this groundbreaking work, extensive research has expanded upon the precise details of when, where and to what degree a bilingual speaker's languages are active. This body of

experimental research has found that in speaking (Kroll & Gollan, 2014), listening (Dijkstra et al., 1999), and reading (Libben & Titone, 2009), a multilingual's two (or more) languages are always active. The relative balance of activity and suppression of the unused language may depend on an individual's proficiency in each language, usage, or age of acquisition (Fricke et al., 2019).

Language co-activation goes hand in hand with a second important psycholinguistic (and sociolinguistic) understanding of bilinguals, the idea that their bilingualism is dynamic over space and time. Grosjean (2013, 2016) articulated this phenomenon as the 'complementarity principle', the idea that bilinguals' proficiency, fluency, and language use varies according to different domains of life (e.g., work vs. home), purposes, speech partners, and modalities (e.g., spoken vs. written), an expansion of Mackey's (1962) 'language functions'. People who used two or more languages in real life, argued Grosjean, were often employing different languages for different communicative purposes, contexts and partners, adapting their linguistic repertoire to the needs of daily life. However, complementarity extends beyond language modalities, and is present across topics (e.g., politics vs. cooking), settings (e.g., work vs. home) and speech partners (e.g., colleagues vs. family). Complementarity does not necessarily imply a linguistic deficit in one communicative domain: even balanced bilinguals who use their languages with roughly parallel proficiency and at roughly similar proportions often use different languages for different discursive functions or in different content domains. Taken in sum, this work has shifted our understanding of language away from a construct that is fixed, unitary, and largely based on overt speech acts. Instead, the consequence of having all of a bilingual's languages simultaneously active, even if subconsciously, is that linguistic identity can be both overt and covert, with capacities and processes that emerge in some contexts, times, language domains,

and locations, and are suppressed in others, according to the demands of the communicative context.

Viewing language co-activation and complementarity together, we envision an intersectional bilingual whose linguistic identities shift dynamically between those which are salient and those which are submerged, depending upon the social context, the speaker's purpose, and the individual's life history. This formulation of shifting identities has long been recognized in sociolinguistic discourse with perhaps the best-known articulation of multiple identities within the individual subject from Kimberlé Crenshaw (1990), writing on intersectionality through a sociological lens. Although Crenshaw used this term to describe the ways that multiple identity systems, including race, gender, class, and language status, operated to marginalize women of color, intersectionality commonly denotes the confluence of multiple social identity constructs in one individual and the ways that some identities are salient and others invisible, depending upon changing social and political contexts (Bagga-Gupta, 2017). Unlike intersectionality theory in sociocultural fields, intersectionality in the domain of psychological research has largely been restricted to examining these multiple identities and not their accompanying power relations or social justice concerns (Cole, 2009; McCormick-Huhn et al., 2019).

In spite of these restrictions, language co-activation, complementarity, and intersectionality nonetheless all address the question of how identity, whether conceived as a social role or a language, can be multiple rather than singular within one individual. Co-activation does not imply a breakdown of the boundaries between languages, but rather a tug-of-war between different languages that are activated by different cues. Co-activation maintains language boundaries while providing a mechanism for both languages to be present even when one is not actively in use In contrast to an idealized monolingual, the bilingual or intersectional

subject depicted here comprises multiple unities, some of which will be salient and some suppressed in any given interactive context. This kind of 'intercategorical intersectionality' (McCall, 2005) elucidates the ways in which subjects might belong to multiple categories of identity groups at the same time, e.g., Spanish speakers and English speakers, just as co-activation allows multiple categories of language to co-exist within the bilingual mind.

Bilingualism is Not a Categorical Variable: Dimensions, Gradients and Hybridity

If co-activation, complementarity and intercategorical intersectionality maintain categorical boundaries between languages in seeking to describe the *multiplicity* of different linguistic identities cohering in one speaking subject, the idea of bilingualism as a graded and multidimensional life experience deconstructs categorical boundaries in seeking to describe the *heterogeneity* of identities within and across different speakers. This problem of heterogeneity has been formulated in a second key question of bilingualism research, namely "what does it mean to be bilingual?", "who is truly a bilingual?" (or monolingual?) (Luk, 2015). Because of the difficulty in capturing the diverse experiences of speaking two or more languages in a binary categorization, psycholinguistic research with bilinguals has used a plethora of overlapping and at times conflicting definitions of bilinguals and monolinguals (Surrain & Luk, 2019). Some studies may consider bilinguals as persons with fluent use of two languages (e.g., Peal & Lambert, 1962) while others may completely disregard proficiency, particularly for developmental learners. For example, 27% of the bilingual child studies examined by Surrain and Luk (2019) did not define their bilingual sample using any proficiency measure, but rather through other criteria such as daily exposure to two languages. Similarly, a study sample of bilinguals may include both individuals who were immersed in two languages from birth and

those who learned their second language in the classroom during adulthood. Cognitive research has discovered that fluency, proficiency, age of exposure and acquisition, the context of language acquisition (e.g., immersive or not), and the duration and continuity of language use are all important dimensions of bilingual experience (Grosjean, 1998) associated with different cognitive and neural outcomes. Further, each of these dimensions of language experience occurs, not categorically, but on a graded continuum and is interrelated with other dimensions of language experience. For example, measures of white matter tracts in the brain have overlapping associations with both age of acquisition (DeLuca et al., 2019; Nichols & Joanisse, 2016; Rossi et al., 2017) of a bilingual's earliest second language as well as the age of acquisition of their most proficient second language (Luk et al., 2020). The expression in cognitive research that bilingualism is not a categorical variable (Luk & Bialystok, 2013) communicates this idea that bilingualism is a graded experience with different descriptive dimensions that cannot be measured with any single yardstick. Thus, when cognitive researchers attempt to compare categorical groups of speakers, they must distill multiple gradients of linguistic experience to a binary categorization: bilinguals vs. monolinguals, minimizing the gradient experience in one (or more) dimensions.

Increasingly, psycholinguistic researchers are taking a 'social turn' (Block, 2003) away from examining a homogeneous and categorical bilingual subject to embracing bilingualism as a dynamic and interactive life experience with multiple dimensions (Pliatsikas et al., 2020). One critical dimension of bilingualism related to language modes and complementarity that has changed psycholinguistic research is an increasing awareness of the importance of the social context of language use. Even for the same levels of language proficiency and ages of acquisition, how bilinguals interact with others matters for cognition. Green and Abutalebi's (2013) Adaptive

Control Hypothesis proposed that cognitive traits adapt to distinguishable social conditions of language use. Individuals who live in single-language environments – social conditions in which they speak each of their languages in contexts relatively isolated from one another, such as one language at home and a different language at work – develop greater skills in inhibiting one language extensively. Those who live in dual-language environments, social conditions where the two languages are used to interact with different individuals across all or most contexts, develop greater skills in both inhibiting one language and flexibly switching between languages in response to cues from their conversational partner. Finally, those who live in social contexts in which most other individuals share the same languages and thus use both languages together freely, might develop greater speech planning but not inhibitory or flexible switching capacities by virtue of the daily linguistic and cognitive demands of their environment. These cognitive adaptations underlie the current debate around bilingual executive functions that we detail in the third section on the colonial legacy of cognitive research.

Although Green and Abutalebi (2013) sought to describe broadly different social contexts, a single individual might have experience with one or all of these different social conditions, sometimes functioning within a single language, or monolingual 'language mode' (Grosjean, 2008, 2013) with monolingual speakers or in bilingual mode with other same-language bilinguals. Thus, the relative separation of languages within different social contexts of use is another graded dimension of bilingual experience that in recent cognitive research has been captured as language entropy (Gullifer & Titone, 2020), or the degree to which a bilingual mixes their languages together in daily interactions. How language co-activation and inhibition are configured to support language entropy in the bilingual mind has been an active topic of research in cognitive science and psycholinguistics. In particular, the ability to use both languages fluidly

within or between sentences is studied across the lifespan in the phenomenon of code-switching (for a review in children, see Yow et al., 2016; for a review in adults, see Toribio, 2001). Adult code-switching behavior varies with individual personality as well as the linguistic setting that one engages socially (Dewaele & Li, 2014). In cognitive research, switching between languages was often seen as responsible for behavioral costs, such as longer response times or more speech errors (Meuter & Allport, 1999). However, recent research has reframed the ability to code-switch as competence rather than a deficit (e.g., Yow et al., 2018).

Distinct language modes thus require both distinct patterns of language entropy and also distinct patterns of cognitive skills to inhibit an unused language or to flexibly switch among different language repertoires or monolingual vs. bilingual communicative partners. The consequences of living in different kinds of multilingual environments can be seen, not just in cognitive traits, but also in measures of brain activity and brain structures (for reviews, see Costa & Sebastián-Gallés, 2014; Hayakawa & Marian, 2019; Pliatsikas & Luk, 2016). Further, these social contexts of use may change across the lifespan (Anderson et al., 2018), creating a dynamic interplay of language and cognition from the child to older adult years that produces highly heterogeneous cognitive and neural outcomes.

Because the social context of use, along with other dimensions of bilingual experience, does not exist as all or nothing but rather along a continuum, dimensionality and gradients in cognitive research describe both intra-group heterogeneity and also the graded variation that exists within the single individual. When measuring bilingualism continuously instead of categorically, there is no rigid separation between bilinguals and monolinguals in most dimensions of language. Thus, while language co-activation and complementarity describe the coexistence of multiple linguistic identities, dimensionality and linguistic gradients relate instead

to breaking down unitary identities or categories. Similarly, in sociolinguistics, while *intercategorical* intersectionality describes the coexistence of multiple social identities within the individual, the sociolinguistic phenomena that attempt to explain heterogeneity within groups are variation and hybridity, forms of *anticategorical* intersectionality (McCall, 2005) that deconstruct identity categories rather than acknowledging boundaries separating multiple identities. The study of variationist sociolinguistics goes back to Labov and encapsulates the idea that languages are not, or not only, best described by categorical features. Instead, they are structured by heterogeneous constraints, i.e., regularities that are not necessarily uniform across all languages and that change over time.

A more recent sociological formulation of this structured heterogeneity comes in the form of hybridity (Bhabha, 1994). Hybridity crudely encapsulated describes discursive entropy, the way in which an individual may merge, mix or translate elements of different discourses to create a new text or discourse (Ackermann, 2012) just as bilingual code-switchers merge, mix and translate elements of their two languages for effective communication and learning. While sociolinguistic hybridity theory does not always articulate gradients in the way that psycholinguistic research has done, hybridity nonetheless serves as a means of describing heterogeneity by blurring categorical boundaries.

Cognitive research findings on language co-activation and language gradients have thus provided a framework for moving beyond the study of monolithic and unitary monolingual speakers to understanding multiplicity and heterogeneity found in the linguistically diverse speakers that have increasingly become the foci of psycholinguistic research. In parallel, sociolinguistic research has developed the concepts of intersectionality and hybridity to account

for the multiplicity and heterogeneity of social identity in the increasingly linguistically diverse societies it examines.

A Bilingual is Not Two Monolinguals in One: Interrogating the Colonial Legacy

If cognitive and sociolinguistic research have both grappled with a shift from investigating language uniformity to investigating language diversity both within and across individuals, the question still remains of how that investigation can take place in a presumably post-colonial academy. A key problem of cognitive research on bilingualism is how this research can move forward without the (colonial) normativity of the ideal monolingual. If Saer's ideal monolingual English speaker is no longer the standard and teleological endpoint of linguistic development, then how do we study bilinguals within a scientific episteme that is sensitive to social complexity? This question is challenging to answer because although the teleology of the British Empire no longer frames cognitive research, the field has inherited normative research questions, constructs and methodologies typified by Saer's (1923) colonialist enterprise.

Contemporary cognitive research on bilingualism is dominated by offshoots of Saer's (1923) and others' research query around superior or inferior mental capacities. The optimal and efficient performance of cognitive activity was predicated on cognitive models developed with white, male, middle-class, Western and largely English monolingual populations as standards of comparison (Burman, 2016; Henrich et al., 2010), even as the construct of intelligence and discourse around intelligence and (later) the intelligence quotient (IQ), was used to justify colonial, racialized conquests (Adas, 2015). The current field has not yet come to terms with its origins in the colonial and racial enterprise of the study of intelligence and mental superiority. Instead, cognitive comparisons have changed, starting with Peal and Lambert (1962), to less

charged terms, such as ‘mental flexibility’. However, psycholinguistics has not moved away from models developed in cognitive psychology where the normative standard of reference in mental testing was the white, male, middle-class Anglophone monolingual (Burman, 2016) with concomitant focus on the skills of “rationality, autonomy, and self-control” (Miller & Scholnick, 2015, p. 268), now termed, not intelligence, but reasoning, executive functions (EF) and cognitive control. EF includes the skills of autonomous planning, detecting and following abstract rules, inhibiting conflicts between internal goals and external stimuli, self-control, and rapid and efficient response (Diamond, 2013), which historically were cast as moral traits of White Europeans and contrasted with the irrationality, lack of self-control and laziness of the stereotyped Native in colonial discourse (Said, 1978). In modern cognitive psychology, these constructs are formulated as cognitive skills rather than moral ones; however, EF discourse continues the same racial stereotyping targeting urban, low socioeconomic status, i.e., code for Black and Brown, populations, who are found to have low EF abilities and to be insufficiently orderly, obedient and self-controlled (Miller & Scholnick, 2015)., Correspondingly in the 1980’s and 1990’s, cognitive comparisons of bilinguals and monolinguals moved from describing intelligence to measuring inhibitory control, cognitive control, and executive functions (Bialystok, 2020).

Findings of bilingual superiority in EF emerged in response to longstanding research that demonstrated monolingual intellectual superiority (Bialystok, 2020) and are supported by neuroscientific and theoretical work such as Green and Abutalebi’s (2013) described previously. But just as with intelligence in the previous century, models of these new mental functions are also intimately tied to the comparison of racialized groups (Burman, 2016) with EF interventions, for example, promoted in low-income and racially segregated schools (Miller & Scholnick, 2015)

due to the expectation that students attending these schools have less than optimal EF development compared to their same-age white peers from middle- or high-income schools. Even today, cognitive research largely focuses on the EF skills of attentional focus, inhibitory control, and controlled task switching, a restricted skill set that Miller & Scholnick (2015) call out as measuring solitary and decontextualized completion of fixed and well-defined tasks, conditions that are not representative of much real-life activity and less so that of those outside the WEIRD — Western, Educated, Industrialized, Rich and Democratic — world (Henrich et al., 2010). Thus, the problematic nature of the debate over bilingual EF is not whether bilinguals are truly superior in this regard, but why superiority is important in our present social context and why isolated EF skills are valued as representations of superiority, whether it is monolinguals (in the past) or bilinguals (currently) who emerge at an advantage. Over half a century ago, Peal & Lambert (1962) hinted that the question of intelligence and the approach of looking for superior outcomes across groups may not be truly beneficial for understanding bilingualism. Whether the future of bilingualism research can break with this tradition and find alternate models of cognitive activity (Bialystok, 2020) with corresponding novel questions, remains yet to be seen.

In addition to research questions, cognitive studies of bilingualism have inherited operational constructs from a colonial era. What counts as a valid language for the cognitive study of bilingualism has been defined by Eurocentric and colonial arrangements, for example with the definition of English and English native speakers inclusive of some (mostly north American) but not other (mostly from the global South) Englishes (Kachru, 1997). Taking its cue from sociolinguistic studies, cognitive bilingualism research is beginning to broaden the boundaries of what qualifies as an appropriate language of investigation, deconstructing what were once considered to be a bilingual's monolithic languages (Sorace, 2020). For example,

bimodal sign and speech bilinguals (Emmorey et al., 2016) are beginning to be reframed as multilinguals of a unique kind rather than categorized as ‘non-standard’ monolingual speakers. Recent psycholinguistic research has also begun to place greater focus on heritage language speakers: In the Anglophone research context, bilinguals are often those who speak English as a second language. Particularly in the U.S., these bilinguals are considered to be not only working towards mastering English as the socially dominant language but also losing their minority, heritage language. Such heritage speakers have been described as language attriters or incomplete acquirers (Montrul, 2006). However, part of the social turn in cognitive bilingualism research is beginning to reframe heritage speakers as a unique group of competent bilinguals, albeit a different kind of bilingual from those who are immersed in the first language environment (Kupisch & Rothman, 2018). A third example of shifting constructs of language comes from the study of individuals who speak multiple dialects of the same language. Recent research has focused on bidialectal speakers’ ability to draw upon linguistic knowledge and skills from both dialects on different linguistic levels: auditory perception (Bühler et al., 2017; Walker, 2018), morphology (Lundquist & Vangsnes, 2018), text comprehension (Schmitt et al., 2018), and language control (Kirk et al., 2018). The majority of this work has taken place in northern Europe, where dialectal variation in the majority language is less stigmatized than in the U.S. Although Labov described the richness of African American English in 1972 and hinted at potential cognitive consequences of bidialectalism in his praise of Larry’s mental gifts, there has been virtually no published cognitive research on the psycholinguistics of bidialectalism in the U.S.

Beyond the legacy of normative research questions revolving around mental superiority and language constructs that specify ideal, largely western languages as objects of research, a

third and perhaps most powerful colonial inheritance is research methodologies that compare bilinguals to a monolingual ideal. For example, norm-referenced language assessments in cognitive research are developed and utilized as a way of providing a standard based on Western and largely Anglophone populations. Bilingual language performance is then evaluated based on comparisons to these monolingual norms. Very few norm-referenced measures have a parallel version in a non-English language or have been developed using multilingual populations as standards (Luk & Christodoulou, 2016). However, and relevant to findings of language co-activation, language modes and language dimensionality, a wealth of psycholinguistic research comparing bilinguals and monolinguals has made clear that possessing a second language results in variation that cannot be reduced back to monolingualism, i.e., that a "bilingual is NOT the sum of two complete or incomplete monolinguals; rather, he or she has a unique and specific linguistic configuration" (Grosjean, 1989, p. 3) of languages that interact, at times changing one another. Standardized measures of language that use largely monolingual, or English-dominant, groups as normative samples in effect measure multilinguals with a single or multiple monolingual yardstick. A new direction in cognitive research thus seeks to design studies that investigate bilinguals in comparison to one another on the various dimensions and gradients of bilingual experience rather than to monolinguals (de Bruin, 2019; Luk & Bialystok, 2013). For example, bilinguals with early L2 exposure may be compared to those with later L2 exposure; code-switchers to single-context bilinguals; and bilinguals with more or less frequent use of L2. Similarly, variation in age of acquisition or in proficiency is investigated across its range in order to avoid categorical comparisons altogether. In addition, researchers have sought to address the measurement problem by developing language assessments normed with multilingual populations. For example, the Bilingual English-Spanish Assessment (Peña et al., 2018)

evaluates young children's combined Spanish and English speech and language development based on a norming sample of U.S. Spanish-English bilingual preschoolers with heterogeneous bilingual abilities. Similarly, the Multi-lingual Naming Test (MINT; Gollan et al., 2012) seeks to assess heterogeneity and language dominance across an individual's multiple languages with its primary validation in English and Spanish. Taking into account the construction of localized measures, cognitive researchers have called for caution when utilizing universalizing methods such as large-sample, global studies which may unknowingly measure different constructs by virtue of differences across cultures and contexts (Bak, 2016) and meta-analyses which combine samples or categories that are identically labeled across studies, but which homogenize populations that are different in important ways (Bak, 2020).

The cognitive study of bilingualism thus faces challenges in confronting a legacy of colonial ideologies, research questions, constructs and methodologies. It has been perhaps most successful in adapting research designs and measures to focus on gradients and hybridity in bilingual language use and perhaps least successful in pivoting away from debating intellectual superiority. It is thus still very much in its early stages of grappling with the tension between a colonial past with its focus on intelligence comparisons and a universalizing and standardizing scientific episteme, and the recognition of multiplicity and heterogeneity, particularly in local contexts. In contrast, the field of sociolinguistics has a rich tradition of examining its colonial past and interrogating the hegemony of Western comparisons, including with post-structuralist (McNamara, 2012) and post-humanist (Pennycook, 2018) thought. We only point here broadly to recent work on decolonizing linguistics and decolonizing language in education that is emerging from Southern theory (Connell, 2008), calling for research from beyond the colonial centers of power and for the possibility of knowledges outside of positivist, quantitative science

(Pennycook & Makoni, 2020). Yet as we have described above, looking to the global South (including minoritized populations in the geographic North) for alternative research questions beyond mental superiority, for non-WEIRD models of cognition and language, and for alternative measures and methodologies offers a way forward even, or perhaps especially, within the positivist, quantitative, cognitive study of bilingualism.

Conclusion

In this chapter, we have outlined three themes in cognitive research on bilingualism aligned with parallel trends in sociolinguistics, that together encompass a shift in both fields from the aim of describing a universal and homogeneous subject to that of accounting for the *multiplicity* and *heterogeneity* of bilingual experiences. Psycholinguistic research on language co-activation and complementarity describes the multiplicity of languages within an individual subject just as the sociocultural concept of intercategorical intersectionality describes the multiplicity of identities. Cognitive research on the dimensions and gradients of bilingual experience accounts for the heterogeneity of multilingualism, just as does sociocultural work on variation, diversity and hybridity. Finally, cognitive bilingualism research has started to consider what it might mean to interrogate colonial *normativity* in the research questions, constructs, and methodologies it has inherited from racialized studies of intelligence and language, while sociolinguistic work already offers some possible directions for de-colonization.

While cognitive research is often considered positivist and reductionist, in many ways cognitive and sociolinguistic research are moving in similar directions, shaped by the same social and geopolitical conditions and reacting to a shared legacy of research that has negatively racialized and politicized bilinguals. These commonalities provide a window into understanding

the competing discourses that surround multilingual children and their teachers in education, including current debates over the cognitive challenges and advantages of multilingualism, executive functions development, and the definition of what is native speech. Combining cognitive and sociolinguistic perspectives thus benefits students, educators and also researchers.

For cognitive researchers in education studying multilingualism, this lens allows us to construct our own hybridities, negotiating the tensions among what is considered scholarly rigor in a positivist, quantitative field, the applied value to education, and a heightened sense of urgency to address racialized or politicized understandings of bilingual and bidialectal students. We have illustrated one way of expanding our empiricist position to recognize shared roots and directions of the sociolinguistic perspective of multilingualism and our professional training in cognitive psychology. In the final section, we conclude with some reflections on ways that both educators and also researchers who understand the synergy between cognitive and sociocultural research are better positioned to negotiate the realities of the colonial past and their hopes and dreams for themselves and others who speak two or more languages or language varieties in the present and future.

Reflection

Below we offer thematic links between the multiplicity, dimensionality and dynamism that cognitive research finds in multilingual experience to support bilingual educators in enriching their curriculum, instruction and assessment practices.

- Language variation involves multiple domains. Current curricular language objectives are often standardized and therefore decontextualized from students' social use of language. Instead, language complementarity suggests bilingual curricula should be tailored to develop language knowledge in specific domains and contexts. For example, instead of

civics units conventionally incorporating mock elections and perhaps election debates, de los Ríos and Molina (2020) illustrate a literacy and civics curriculum that built upon a community context of undocumented immigration and needs for sanctuary to incorporate and deepen students' prior language knowledge from community linguistic repertoires of speeches, *testimonios*, and *corridos*, or folk ballads.

- Multilingual experience involves multiple linguistic identities. Students need to hear the message that they are legitimate members of their multiple language communities who have optimized their language use in their particular communicative context. For example, educators can help Spanish-English bilinguals understand that they are neither deficient Spanish, nor deficient English speakers by incorporating students' current bilingual literacy practices such as spoken word (Seltzer, 2020), or song (de los Ríos, 2018) into lessons.
- Multilingual experience can vary on many different dimensions, involving heterogeneous linguistic identities even in the same language. Two students who have similar levels of Spanish and English vocabulary, for example, might respond to lessons differently because they learned one or both languages in different contexts, or because they use their two languages with different levels of entropy.
- Multilingual experience can have different levels of entropy. In separated language classrooms (Jones Martin, 2007), language co-activation means that both languages are still always present. This means that some students may require additional time or scaffolding to respond in one language than another. In translanguaging classrooms (García, 2009; Li, 2018), translanguaging may support students whose language practices involve higher degrees of language entropy. Other students who live in lower entropy

environments, while equally bilingual, may not respond as quickly or as well to translanguaging instruction.

- Multilingual experience is not a duplication of multiple monolingual experiences. For example, allowing learners to respond in their dominant language when assessing language knowledge can reveal a more complete picture of their linguistic repertoire and content knowledge. This means that standardized monolingual assessments should be interpreted along with assessments in a dominant language. Standardized assessments may also be less useful in understanding a student's progress or achievement than formative or dynamic assessments that specify language functions and topic domains.
- The importance of bilingualism does not build on comparison to monolinguals. We should speak up to counter misperceptions of bilingualism as a cognitive or linguistic disadvantage or delay as monolingual superiority is not supported by research evidence. At the same time, we must be cautious of presenting superiority, whether in executive functions or other domains, particularly of cognition, as an advantage of bilingualism because this superiority is based upon a highly restricted set of cognitive skills that are historically linked to colonialist and racialized language ideologies. Bilingual educators and researchers should question why it seems important to argue for mental superiority and whether there are alternate ways of understanding the richness of bilingualism in their particular local contexts or fields of study.

Future Transdisciplinary Questions

- How can cognitive research move forward from colonial models of mental superiority, monolithic language constructs and normative methodologies? In this chapter, we have outlined some steps towards diversifying language constructs with heritage languages and

dialects and towards creating multilingual language assessments based on diverse populations. However, the continuing debate over bilingual advantages in executive functions is a reminder that there is still work to do in finding viable cognitive models for research as alternatives to normative comparisons of mental superiority. Confronting the past is thus critical for developing a robust and relevant contemporary science of bilingualism, looking to anti-racist leaders across the language sciences (e.g. Charity Hudley et al., 2020).

- Even with such a science, neurolinguistic, psycholinguistic and sociolinguistic research all examine language at different levels of analysis: brain, mind, and society. In the prior reflections for bilingual educators, we have pointed to some commonalities among these different descriptive levels. However, truly linking these levels of analysis requires an evidence base which does not currently exist (cf. Churchland & Sejnowski, 1988 on brain activity, computational modelling, and cognitive processes). How does a lesson centered on community *corridos* engage the mind and brain for Spanish-English youth living in border contexts? How does prior language entropy change the impact of translanguaging in lesson context? Research projects that begin to bridge these levels of analysis by examining neural and mental processes in naturalistic discourse contexts are important for drawing convincing conclusions that will benefit students and educators.

References

Ackermann, A. (2012). Cultural hybridity: Between metaphor and empiricism. In *Conceptualizing cultural hybridization* (pp. 5–25). Springer.

Adas, M. (2015). *Machines as the measure of men: Science, technology, and ideologies of Western dominance*. Cornell University Press.

Antoniou, M. (2019). The advantages of bilingualism debate. *Annual Review of Linguistics*, *5*(1), 395–415. https://doi.org/10.1146/annurev-linguistics-011718-011820

Bagga-Gupta, S. (2017). Language and identity beyond the mainstream: Democratic and equity issues for and by whom, where, when and why. *Journal of the European Second Language Association*, *1*(1), 102–112. https://doi.org/10.22599/jesla.22

Bak, T. (2016). Cooking pasta in La Paz: Bilingualism, bias and the replication crisis. *Linguistic Approaches to Bilingualism*, *6*(5), 699–717.

Bak, T. (2020, June 25). *Why cognitive neuroscience leads us to sociolinguistics*. Conference on Multilingualism, Reading, UK.

Barreto, A. A. (1998). *Language, elites, and the state :Nationalism in Puerto Rico and Quebec*. Westport, Conn. : http://hdl.handle.net/2027/mdp.39015040039862

Bialystok, E. (2020, June 25). *What's the mechanism? Framing the question for future research*. Conference on Multilingualism, Reading, UK.

Block, D. (2003). *The social turn in second language acquisition.* Georgetown University Press.

Bühler, J. C., Schmid, S., & Maurer, U. (2017). Influence of dialect use on speech perception: A mismatch negativity study. *Language, Cognition and Neuroscience*, *32*(6), 757–775. https://doi.org/10.1080/23273798.2016.1272704

Burman, E. (2016). *Deconstructing developmental psychology*. Taylor & Francis.

Cargnelutti, E., Tomasino, B., & Fabbro, F. (2019). Language brain representation in bilinguals with different age of appropriation and proficiency of the second language: A meta-analysis of functional imaging studies. *Frontiers in Human Neuroscience*, *13*. https://doi.org/10.3389/fnhum.2019.00154

Carlo, M. S., August, D., Mclaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., Lively, T. J., & White, C. E. (2004). Closing the gap: Addressing the vocabulary needs of English-language learners in bilingual and mainstream classrooms. *Reading Research Quarterly*, *39*(2), 188–215. https://doi.org/10.1598/RRQ.39.2.3

Charity Hudley, A. H., Mallinson, C., & Bucholtz, M. (2020). Toward racial justice in linguistics: Interdisciplinary insights into theorizing race in the discipline and diversifying the profession. *Language*, *96*(4), e200–e235. https://doi.org/10.1353/lan.2020.0074

Churchland, P. S., & Sejnowski, T. J. (1988). Perspectives on cognitive neuroscience. *Science*, *242*(4879), 741–745. https://doi.org/10.1126/science.3055294

Cole, E. R. (2009). Intersectionality and research in psychology. *American Psychologist*, *64*(3), 170–180. https://doi.org/10.1037/a0014564

Connell, R. (2008). *Southern theory: The global dynamics of knowledge*. Crow's Nest, Australia: Allen & Unwin.

Costa, A., & Sebastián-Gallés, N. (2014). How does the bilingual experience sculpt the brain? *Nature Reviews Neuroscience*, *15*(5), 336–345. https://doi.org/10.1038/nrn3709

Crenshaw, K. (1990). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review*, *43*(6), 1241–1300.

de Bruin, A. (2019). Not all bilinguals are the same: A call for more detailed assessments and descriptions of bilingual experiences. *Behavioral Sciences*, *9*(3), 33. https://doi.org/10.3390/bs9030033

de los Ríos, C. V. (2018). Toward a corridista consciousness: Learning from one transnational youth's critical reading, writing, and performance of Mexican corridos. *Reading Research Quarterly*, *53*(4), 455–471. https://doi.org/10.1002/rrq.210

de los Ríos, C. V., & Molina, A. (2020). Literacies of Refuge: "Pidiendo Posada" as Ritual of Justice. *Journal of Literacy Research*, *52*(1), 32–54. https://doi.org/10.1177/1086296X19897840

Dehaene-Lambertz, G., Hertz-Pannier, L., & Dubois, J. (2006). Nature and nurture in language acquisition: Anatomical and functional brain-imaging studies in infants. *Trends in Neurosciences*, *29*(7), 367–373. https://doi.org/10.1016/j.tins.2006.05.011

DeLuca, V., Rothman, J., Bialystok, E., & Pliatsikas, C. (2019). Redefining bilingualism as a spectrum of experiences that differentially affects brain structure and function. *Proceedings of the National Academy of Sciences*, *116*(15), 7565–7574. https://doi.org/10.1073/pnas.1811513116

Dewaele, J.-M., & Li, W. (2014). Intra- and inter-individual variation in self-reported code-switching patterns of adult multilinguals. *International Journal of Multilingualism*, *11*(2), 225–246. https://doi.org/10.1080/14790718.2013.878347

Dijkstra, T., Grainger, J., & Van Heuven, W. J. (1999). Recognition of cognates and interlingual homographs: The neglected role of phonology. *Journal of Memory and Language*, *41*(4), 496–518.

Emmorey, K., Giezen, M. R., & Gollan, T. H. (2016). Psycholinguistic, cognitive, and neural implications of bimodal bilingualism. *Bilingualism: Language and Cognition, 19*(2), 223–242.

Escamilla, K. (2006). Semilingualism applied to the literacy behaviors of Spanish-speaking emerging bilinguals: Bi-illiteracy or emerging biliteracy? *Teachers College Record, 108*(11), 2329.

Foucault, M. (1980). *Power/knowledge: Selected interviews and other writings, 1972-1977*. Vintage.

Fraser, G. (2011). Immersion schools: Wallace Lambert's legacy. *Canadian Issues/Thèmes Canadiens, Fall*, 10–11.

Freeman, Y. S., & Freeman, D. E. (2002). *Closing the achievement gap: How to reach limited-formal-schooling and long-term English learners*. Heinemann.

Fricke, M., Zirnstein, M., Navarro-Torres, C., & Kroll, J. F. (2019). Bilingualism reveals fundamental variation in language processing. *Bilingualism: Language and Cognition, 22*(1), 200–207. https://doi.org/10.1017/S1366728918000482

García, O. (2009). Bilingualism and translanguaging. *Bilingual Education in the 21st Century: A Global Perspective*, 42–72.

Gollan, T. H., Weissberger, G. H., Runnqvist, E., Montoya, R. I., & Cera, C. M. (2012). Self-ratings of spoken language dominance: A Multilingual Naming Test (MINT) and preliminary norms for young and aging Spanish–English bilinguals*. *Bilingualism: Language and Cognition, 15*(3), 594–615. https://doi.org/10.1017/S1366728911000332

Green, D. W., & Abutalebi, J. (2013). Language control in bilinguals: The adaptive control hypothesis. *Journal of Cognitive Psychology*, *25*(5), 515–530. https://doi.org/10.1080/20445911.2013.796377

Grosjean, F. (1989). Neurolinguists, beware! The bilingual is not two monolinguals in one person. *Brain and Language*, *36*(1), 3–15. https://doi.org/10.1016/0093-934X(89)90048-5

Grosjean, F. (1998). Studying bilinguals: Methodological and conceptual issues. *Bilingualism: Language and Cognition*, *1*(2), 131–149. https://doi.org/10.1017/S136672899800025X

Grosjean, F. (2008). *Studying bilinguals*. Oxford University Press.

Grosjean, F. (2013). *The psycholinguistics of bilingualism*. John Wiley & Sons Inc.

Grosjean, F. (2016). The complementarity principle and its impact on processing, acquisition, and dominance. In *Language dominance in bilinguals: Issues of measurement and operationalization* (pp. 66–84).

Gullifer, J. W., & Titone, D. (2020). Characterizing the social diversity of bilingualism using language entropy. *Bilingualism: Language and Cognition*, *23*(2), 283–294. https://doi.org/10.1017/S1366728919000026

Hagoort, P. (2017). The core and beyond in the language-ready brain. *Neuroscience & Biobehavioral Reviews*, *81*, 194–204. https://doi.org/10.1016/j.neubiorev.2017.01.048

Hayakawa, S., & Marian, V. (2019). Consequences of multilingualism for neural architecture. *Behavioral and Brain Functions*, *15*(1), 6. https://doi.org/10.1186/s12993-019-0157-z

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, *33*(2–3), 61–83. https://doi.org/10.1017/S0140525X0999152X

Jones Martin, M. (2007). Bilingualism, education and the regulation of access to language resources. In M. Heller (Ed.), *Bilingualism: A Social Approach* (pp. 161–182). Palgrave Macmillan UK. https://doi.org/10.1057/9780230596047_8

Kachru, B. B. (1997). World Englishes and English-using communities. *Annual Review of Applied Linguistics*, *17*, 66–87. https://doi.org/10.1017/S0267190500003287

Kirk, N. W., Kempe, V., Scott-Brown, K. C., Philipp, A., & Declerck, M. (2018). Can monolinguals be like bilinguals? Evidence from dialect switching. *Cognition*, *170*, 164–178. https://doi.org/10.1016/j.cognition.2017.10.001

Kroll, J. F., & Gollan, T. H. (2014). *Speech planning in two languages: What bilinguals tell us about language production.*In M. Goldrick, V. Ferreira, & M. Miozzo (Eds.), *The Oxford handbook of language production* (p. 165-181). Oxford University Press.

Kupisch, T., & Rothman, J. (2018). Terminology matters! Why difference is not incompleteness and how early child bilinguals are heritage speakers. *International Journal of Bilingualism*, *22*(5), 564–582. https://doi.org/10.1177/1367006916654355

Labov, W. (1972). *Language in the inner city: Studies in the Black English vernacular* (Vol. 3). University of Pennsylvania Press.

Labov, W. (1982). Objectivity and commitment in linguistic science: The case of the Black English trial in Ann Arbor. *Language in Society*, *11*(2), 165–201.

Li, W. (2018). Translanguaging as a practical theory of language. *Applied Linguistics*, *39*(1), 9–30. https://doi.org/10.1093/applin/amx039

Libben, M. R., & Titone, D. A. (2009). Bilingual lexical access in context: Evidence from eye movements during reading. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *35*(2), 381.

Luk, G. (2015). Who are the bilinguals (and monolinguals)? *Bilingualism: Language and Cognition*, *18*(1), 35–36. https://doi.org/10.1017/S1366728914000625

Luk, G., & Bialystok, E. (2013). Bilingualism is not a categorical variable: Interaction between language proficiency and usage. *Journal of Cognitive Psychology*, *25*(5), 605–621. https://doi.org/10.1080/20445911.2013.795574

Luk, G., & Christodoulou, J. (2016). Assessing and understanding the needs of dual-language learners. In N. Lesaux & S. Jones (Eds.), *The leading edge of early childhood education: Linking science to policy for a new generation* (pp. 67–90). Harvard Education Press.

Luk, G., Mesite, L., & Leon Guerrero, S. (2020). Onset age of second language acquisition and fractional anisotropy variation in multilingual young adults. *Journal of Neurolinguistics*, *56*, 100937.

Lundquist, B., & Vangsnes, Ø. A. (2018). Language separation in bidialectal speakers: Evidence from eye tracking. *Frontiers in Psychology*, *9*, 1394. https://doi.org/10.3389/fpsyg.2018.01394

Mackey, W. F. (1962). The description of bilingualism. *Canadian Journal of Linguistics/Revue Canadienne de Linguistique*, *7*(2), 51–85.

Marian, V., Spivey, M., & Hirsch, J. (2003). Shared and separate systems in bilingual language processing: Converging evidence from eyetracking and brain imaging. *Brain and Language*, *86*(1), 70–82. https://doi.org/10.1016/S0093-934X(02)00535-7

May, S. (2014). Disciplinary divides, knowledge construction, and the multilingual turn. *The Multilingual Turn: Implications for SLA, TESOL and Bilingual Education*, *7*, 31.

McCall, L. (2005). The complexity of intersectionality. *Signs: Journal of Women in Culture and Society*, *30*(3), 1771–1800. https://doi.org/10.1086/426800

McCormick-Huhn, K., Warner, L. R., Settles, I. H., & Shields, S. A. (2019). What if psychology took intersectionality seriously? Changing how psychologists think about participants. *Psychology of Women Quarterly, 43*(4), 445–456. https://doi.org/10.1177/0361684319866430

McNamara, T. (2012). Poststructuralism and its challenges for applied linguistics. *Applied Linguistics, 33*(5), 473–482.

Meuter, R. F. I., & Allport, A. (1999). Bilingual language switching in naming: Asymmetrical costs of language selection. *Journal of Memory and Language, 40*(1), 25–40. https://doi.org/10.1006/jmla.1998.2602

Miller, P. H., & Scholnick, E. K. (2015). Feminist theory and contemporary developmental psychology: The case of children's executive function. *Feminism & Psychology, 25*(3), 266–283. https://doi.org/10.1177/0959353514552023

Montrul, S. A. (2006). Incomplete acquisition as a feature of bilingual and L2 grammars. In *Inquiries in linguistic development* (pp. 335–359). John Benjamins.

Nichols, E. S., & Joanisse, M. F. (2016). Functional activity and white matter microstructure reveal the independent effects of age of acquisition and proficiency on second-language learning. *NeuroImage, 143,* 15–25. https://doi.org/10.1016/j.neuroimage.2016.08.053

Peal, E., & Lambert, W. E. (1962). The relation of bilingualism to intelligence. *Psychological Monographs: General and Applied*, *76*(27), 1.

Peña, E. D., Gutiérrez-Clellen, V. F., Iglesias, A., Goldstein, B., & Bedore, L. M. (2018). Bilingual English Spanish Assessment (BESA). *Baltimore, MD: Brookes*.

Pennycook, A. (2018). Posthumanist applied linguistics. *Applied Linguistics, 39*(4), 445–461. https://doi.org/10.1093/applin/amw016

Pennycook, A., & Makoni, S. (2020). *Innovations and challenges in applied linguistics from the global south*. Routledge.

Pliatsikas, C., DeLuca, V., & Voits, T. (2020). The many shades of bilingualism: Language experiences modulate adaptations in brain structure. *Language Learning*, *70*(S2), 133–149. https://doi.org/10.1111/lang.12386

Pliatsikas, C., & Luk, G. (2016). Executive control in bilinguals: A concise review on fMRI studies. *Bilingualism: Language and Cognition*, *19*(4), 699–705. https://doi.org/10.1017/S1366728916000249

Rossi, E., Cheng, H., Kroll, J. F., Diaz, M. T., & Newman, S. D. (2017). Changes in white-matter connectivity in late second language learners: Evidence from diffusion tensor imaging. *Frontiers in Psychology*, *8*, 2040. https://doi.org/10.3389/fpsyg.2017.02040

Saer, D. J. (1923). The effect of bilingualism on intelligence. *British Journal of Psychology. General Section*, *14*(1), 25–38. https://doi.org/10.1111/j.2044-8295.1923.tb00110.x

Said, E. W. (1978). *Orientalism* (1st ed.). New York : Pantheon. http://hdl.handle.net/2027/mdp.39015020629682

Schmitt, J. M., Auer, P., & Ferstl, E. C. (2018). Understanding fairy tales spoken in dialect: An fMRI study. *Language, Cognition and Neuroscience*, *0*(0), 1–17. https://doi.org/10.1080/23273798.2018.1533139

Seltzer, K. (2020). “My English is its own rule”: Voicing a translingual sensibility through poetry. *Journal of Language, Identity & Education*, *19*(5), 297–311. https://doi.org/10.1080/15348458.2019.1656535

Sorace, A. (2020, June 25). *Deconstructing the monolingual advantage*. Conference on Multilingualism, Reading, UK.

Surrain, S., & Luk, G. (2019). Describing bilinguals: A systematic review of labels and descriptions used in the literature between 2005–2015. *Bilingualism: Language and Cognition*, *22*(2), 401–415. https://doi.org/10.1017/S1366728917000682

Toribio, A. J. (2001). On the emergence of bilingual code-switching competence. *Bilingualism: Language and Cognition*, *4*(3), 203–231. https://doi.org/10.1017/S1366728901000414

Vertovec, S. (2007). Super-diversity and its implications. *Ethnic and Racial Studies*, *30*(6), 1024–1054.

Walker, A. (2018). The effect of long-term second dialect exposure on sentence transcription in noise. *Journal of Phonetics*, *71*, 162–176. https://doi.org/10.1016/j.wocn.2018.08.001

Yow, W. Q., Patrycia, F., & Flynn, S. (2016). Code-switching in childhood. In *Bilingualism across the lifespan: Factors moderating language proficiency.* (pp. 81–100). American Psychological Association.

Yow, W. Q., Tan, J. S. H., & Flynn, S. (2018). Code-switching as a marker of linguistic competence in bilingual children. *Bilingualism: Language and Cognition*, *21*(5), 1075–1090. https://doi.org/10.1017/S1366728917000335